Online Appendix for: "Explaining support for redistribution: social insurance systems and fairness"

Contents

A Observational Data

A.1 Multiple Imputation

I use multiple imputation to address missing values in the survey data. Multiple imputation allows to generate full data sets and to estimate conservative standard errors which reflect uncertainty due to missing data (Rubin 1987). For each missing cell, I impute five values. This procedure generates five complete (imputed) data sets (Honaker and King 2010; King et al. 2001). Observed values are the same across these data sets. Imputed values are drawn from multivariate normal distributions conditional on observed values. I perform all analysis on each of the five data sets. My models are then averaged and adjust standard errors to reflect uncertainty of the imputed values (Rubin 1987). Table C.4 provides summary statistics for imputed data and the raw data with listwise deletion. Differences between the two approaches are small.

The assumption for multiple imputation is that data is missing at random. This means that missingness is due to observed values but not to unobserved values. I include additional covariates in the imputation model which will not be part of the analysis in order to better predict missing values. In order to better predict individual income, I include the following covariates: the number of children living in the household, satisfaction with one's current income, one's subjective health, life satisfaction, and political ideology (following Rueda and Stegmueller 2016)[1].

A.2 Country and Year Overview

Table A.1: Countries and years included in the analysis.

Country	ESS round						
AT	2002	2004	2006				2014
BE	2002	2004	2006	2008	2010	2012	2014
CH	2002	2004	2006	2008	2010	2012	2014
DE	2002	2004	2006	2008	2010	2012	2014
DK	2002	2004	2006	2008	2010	2012	2014
ES	2002	2004	2006	2008	2010	2012	2014
FI	2002	2004	2006	2008	2010	2012	2014
FR		2004	2006	2008	2010	2012	2014
GB	2002	2004	2006	2008	2010	2012	2014
IE		2004		2008	2010	2012	2014
IT	2002	2004				2012	
NL	2002	2004	2006	2008	2010	2012	2014
NO	2002	2004	2006	2008	2010	2012	2014
PT	2002	2004	2006	2008		2012	2014
SE	2002	2004	2006	2008	2010	2012	2014

Table A.1 reports country and ESS round (year) included in the analysis.

1. I do not impute values for redistribution age and gender. I delete rows with missing values in these variables before multiple imputation.

A.3 Relative Income

The ESS measures income by asking individuals to place their household's total income, after tax and compulsory deductions, from all sources on a card with income giving yearly, monthly, or weekly figures. The surveys from 2002-2006 use cards with 12 intervals which are equal for every country. The 2008-2014 surveys use 10 income bands. Intervals are based on deciles of the actual household income range in the given country. The median is in the top of the fifth decile and serves as reference point to calculate the ten deciles.

The theoretical concept I am interested in is the distance to the mean income in a given country. I therefore follow previous authors (e.g. Rueda and Stegmueller 2016) and create a comparable income measure based on the following procedure. As described in the introduction, I first transform income bands into their midpoints (e.g. Hout 2004). Category J in the survey years 2002-2006, for example, ranges from EUR 18,000 to EUR 36,000. This comprises to EUR 27,000. I do the same for the 2008-2012 survey years, while taking into account country and year variation in the income bands. Second, I impute the top-income category by assuming that the upper tail of the income distribution follows a Pareto distribution (Kopczuk, Saez, and Song 2010). Third, I convert a country's currency into PPP-adjusted constant 2005 U.S. dollars. Finally, I calculate the distance between an individual's income and the mean income for a given country in a given year (Figure A.1 in Section A.4 in the Appendix shows the distribution of income distances across countries)[2].

A.4 Distribution of Income Distance

Figure A.1 plots the income distribution across the 15 European countries in the study. Kernel density estimated smooth over income categories. The bandwidth is fixed at 14. Blue lines show the density of the raw data before imputation, red lines show the density of the imputed income data. I average over the years 2002-2014.

A.5 Calculation of Unemployment Risk

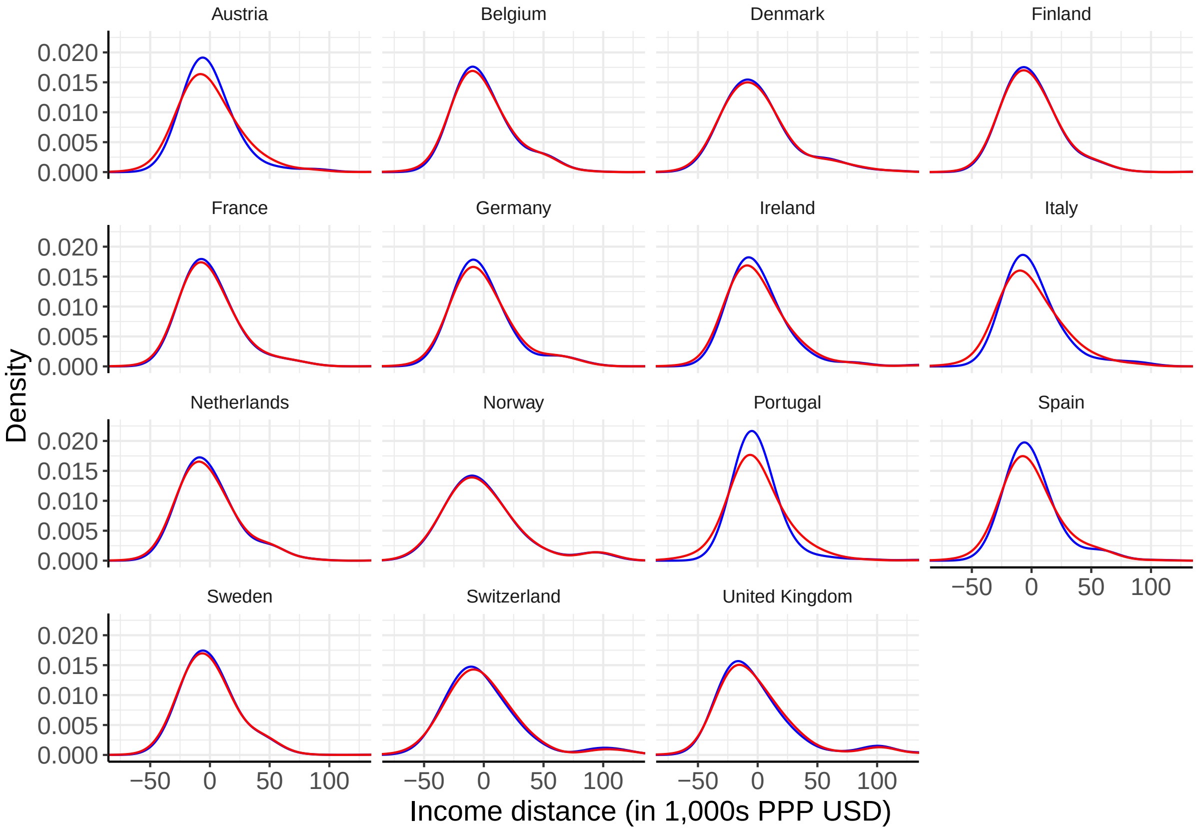
The formula to obtain the occupational unemployment rate is:

$$OUR_j = \frac{\#\text{ unemployed in occupation j}}{\#\text{ unemployed in occupation j} + \#\text{ employed in occupation j}} * 100. \quad (1)$$

For further information on the calculation approach, see Rehm (2011). Rueda (2018) provide further information on the calculation of their indicator. Note that the procedure of relying on self-reported occupation bears several limitations. Subjects may be without

2. Incomes are aggregated over all 7 waves of the ESS. The focus of the analysis will be on the effect of distances to the country-year mean on support for redistribution.

Figure A.1: Distribution of income distance.



Kernel density estimates (Gaussian kernel, band width 14). Blue line shows raw data, red line imputed data.

employment or have entered retirement at the time of the survey. However, I do not impose restrictions on the calculation of the unemployment rate in order to capture a respondent's experienced risk exposure when being in employment.

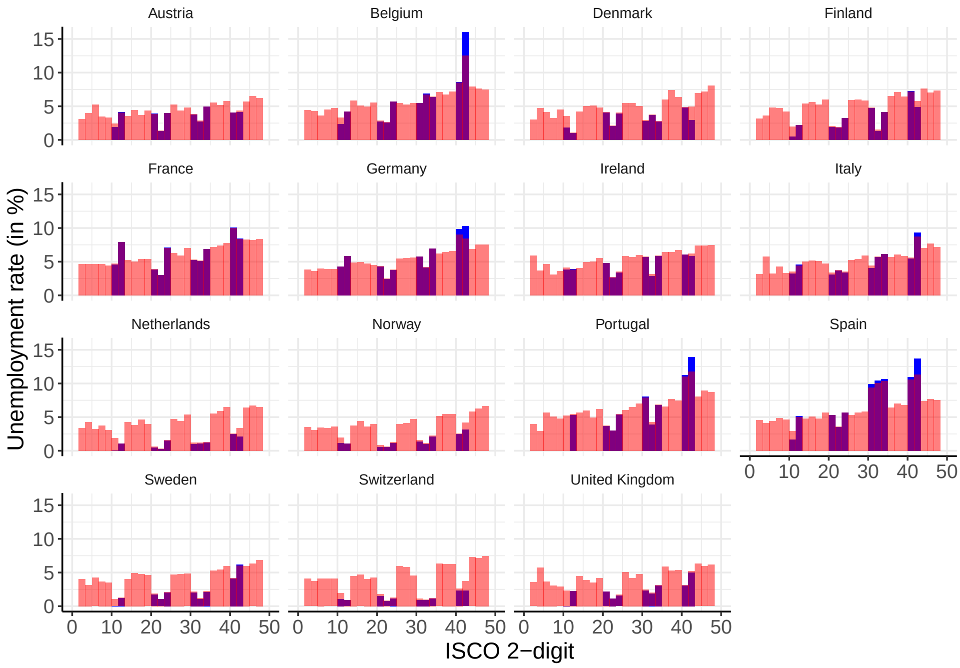
A.6 Distribution of Unemployment Risk

Figure A.2 plots the distribution of unemployment risk by 2-digit ISCO categories in the 15 Western European countries. Blue bars report unemployment risk in listwise deleted data, red lines report unemployment risk in the imputed income data. Values are averages over the years 2002-2014.

B Social Insurance Design

The benefit concentration indicator is calculated on the basis of unemployment net replacement rates. Replacement rates capture the ratio of net income while out-of-work divided by net income while in-work. Out-of-work income encompasses unemployment

Figure A.2: Distribution of unemployment risk over 2-digit ISCO.



Note: Blue bars show raw data, red bars imputed data.

benefit entitlement paid as unemployment insurance benefits, but also unemployment assistance, social assistance, family benefits and lone-parent benefits, housing benefits, child-raising allowance paid to parents assuming childcare responsibilities for their own children and employment-conditional benefits, as well as personal income tax and employees' social security contributions.

The OECD tax-benefit calculator includes complex policy rules across countries. It allows to compute the amount of benefits a person is entitled to when out-of-work in a given country and a given year. The calculator simulates out-of-work income for different family types and earnings levels. Earnings levels are represented in percentage of the average earner, and range from 50 per cent of the average earner's wage to 200 per cent of the average earner's wage. Calculations are provided for family incomes in-work and out-of-work conditions.

Unemployment insurance entitlement depends on a multitude of socio-economic circumstances. The calculation of net replacement rates therefore hinges on a set of assumptions about the prototypical income earner. The standard assumption for the unemployment insurance calculations is that 1) the benefit recipient is 40 years old and has been continuously full-time employed, 2) has contributed to the unemployment insurance fund since the age of 18, 3) where insurance is voluntary (some Nordic countries), the individual has contributed to the fund, and 4) the individual falls into the standard unemployment insurance system. The representative individual in the calculation model is virtually always entitled to receive the unemployment benefit. Benefits are often based on previous earnings. The assumption is that the individual has earned the same amount of income over whatever period the assessment for the benefit is based upon[3].

I proceed in two steps. First, I employ the tax-benefit calculator to compute replacement rates for a range of incomes in the 15 European countries included in this study. Second, I use the information on replacement rates to generate the benefit concentration indicator. The benefit concentration indicator reveals information on the social insurance principle for different countries. It aggregates differences in the distribution of replacement rates across the income span into a macro measure.

B.1 Replacement Rates

I calculate net replacement rates for two prototypical family types: a single earner with no children and a married couple with two children (aged four and six) and the spouse earning 67 per cent of the average earner. I calculate replacement rates for a representative individual in each family type for an income range from 50 per cent of the average wage (50 per cent AW) to 200 per cent (200 per cent AW) of the average wage by 1 per cent steps. I repeat the same procedure for each year and each country included in the ESS.

Figure B.3: Replacement rates. Married, two children, spouse works 67%, across Western European countries, calculated for 50% AW, AW, 200% AW respectively.

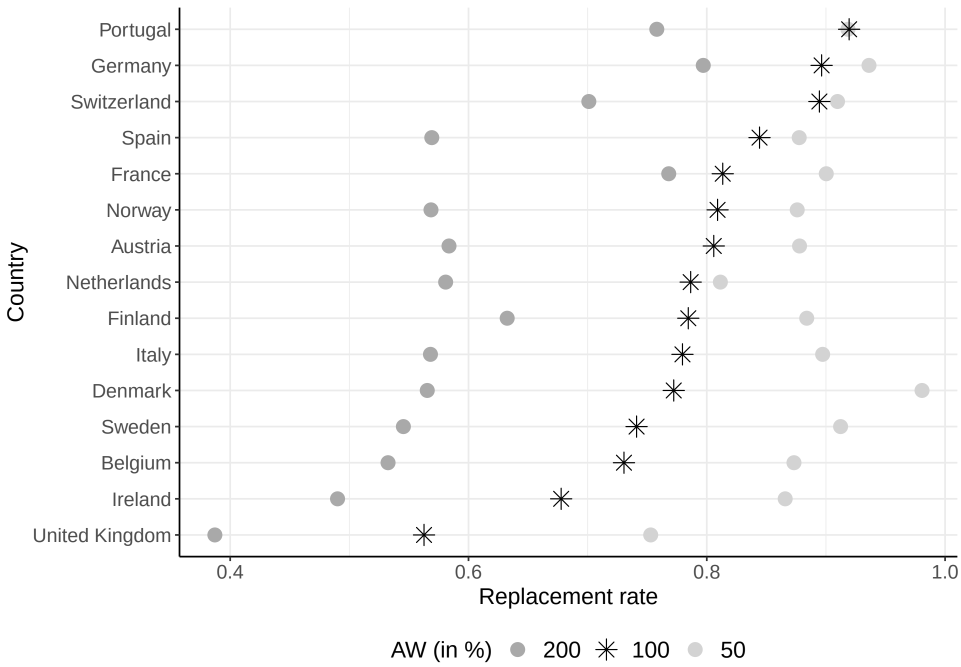
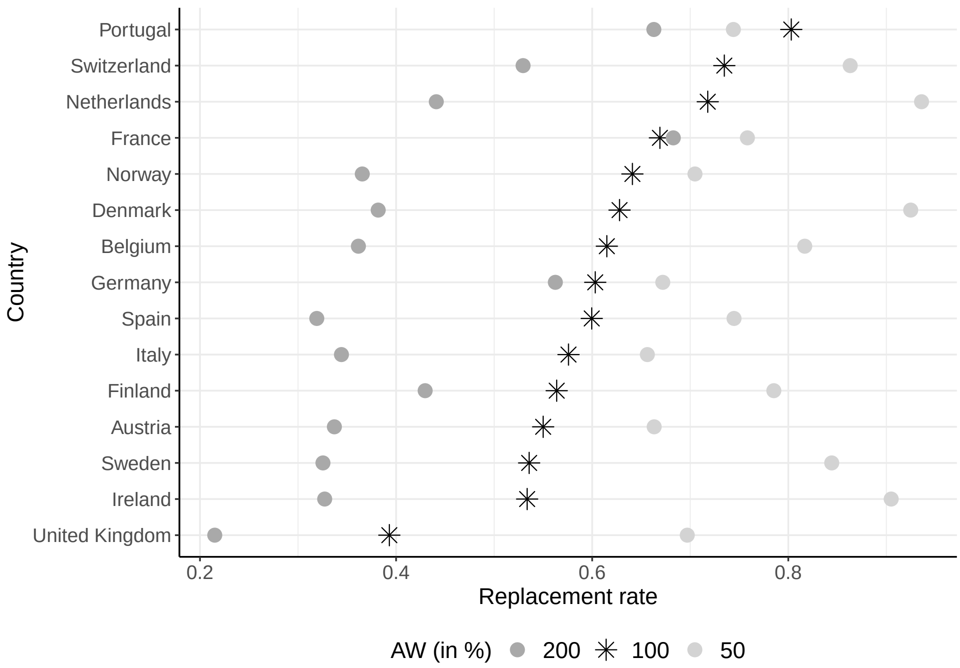


Figure B.3 and Figure B.4 report replacement rates for three income groups, averaged over the time period 2002-2014 in 2-year steps. The average earner (AW), a represen-

3. For further information, consult http://www.oecd.org/social/benefits-and-wages.htm.

Figure B.4: Replacement rates. Single, no children, across Western European countries, calculated for 50% AW, AW, 200% AW respectively.



tative earner who earns half the wage of the average earner (AW 50 per cent), and a representative earner with twice the wage of the average earner (AW 200 per cent). Benefit calculations depend on the specific family situation. I provide calculations for two representative cases, a married couple with two children and the spouse earning 67 per cent of the average earner, and a single person with no children. Both figures reveal that 1) The level of replacement rates varies widely across countries for all income groups, 2) differences in replacement rates for each income group within the countries vary strongly, and 3) variation in replacement rates is higher among high-income earners (200 per cent AW) (from 39 per cent to 80 per cent for married couples, and 22 per cent to 68 per cent for single persons), than among low income earners (50 per cent AW),(from 75 per cent to 98 per cent for married, and 66 per cent to 94 per cent for single persons).

Table B.2: Married couple, 2 children, gross earning spouse 67% of AW.

	min	mean	max
AW 50%	0.75	0.88	0.98
AW 100%	0.56	0.79	0.92
AW 200%	0.39	0.60	0.80

Table B.2 and Table B.3 report variation in replacement rates between low-income earners and high-income earners.

Table B.3: Single person, no children.

	min	mean	max
AW 50%	0.66	0.78	0.94
AW 100%	0.39	0.61	0.80
AW 200%	0.22	0.42	0.68

B.2 Benefit Concentration Indicator

The benefit concentration indicator aggregates differences in the distribution of replacement rates across the income range within countries. The indicator is calculated by comparing the cumulative share of benefits that each income group receives to the share that each income group would receive under perfect proportionality. For example, perfect proportionality is achieved if the replacement rate is constant over the income distribution, i.e. the same share of previous income is being replaced with benefits. Deviation from proportionality indicates whether one income-group receives a higher cumulative share of benefits than the other. This is the case in flat-rate systems, where everyone receives the same absolute amount of benefits, meaning, the replacement rate decreases as income increases.

The logic I follow to calculate benefit concentration is similar to the Gini Coefficient calculation. The Gini Coefficient is often represented graphically through the Lorenz curve, which plots the population percentile by income on the horizontal axis and cumulative income on the vertical axis. I am interested in benefit concentration, and therefore plot the population percentile by income (as percentage of the average wage) on the horizontal axis and cumulative benefits (captured by replacement rates) on the vertical axis. I then split the income range into low-income earners (AW 50 per cent to AW 75 per cent by one per cent steps) and high-income earners (AW 175 per cent to AW 200 per cent by one per cent steps). For each income group respectively, I use the trapezoidal rule for estimating definite integrals to approximate the area under the curve based on calculated replacement rates and the area under the proportionality curve where everyone receives benefits proportional to their earnings. The Trapezoidal Rule is formally stated as follows:

Assume that $f(x)$ is continuous over [a,b]. Let n be a positive integer and $\Delta x = \frac{b-a}{N}$. Let $[a, b]$ be divided into n subintervals, each of length Δx, with endpoints at $P = x_0, x_1, x_2 \ldots, x_n$.

Set

$$T_n = \int_a^b f(x), dx \approx \frac{\Delta x}{2}(f(x_0) + 2f(x_1) + 2f(x_2) \ldots + 2f(x_n - 1) + f(x_n)). \quad (2)$$

Then, $\lim_{n\to\infty} T_n = \int_a^b f(x), dx$

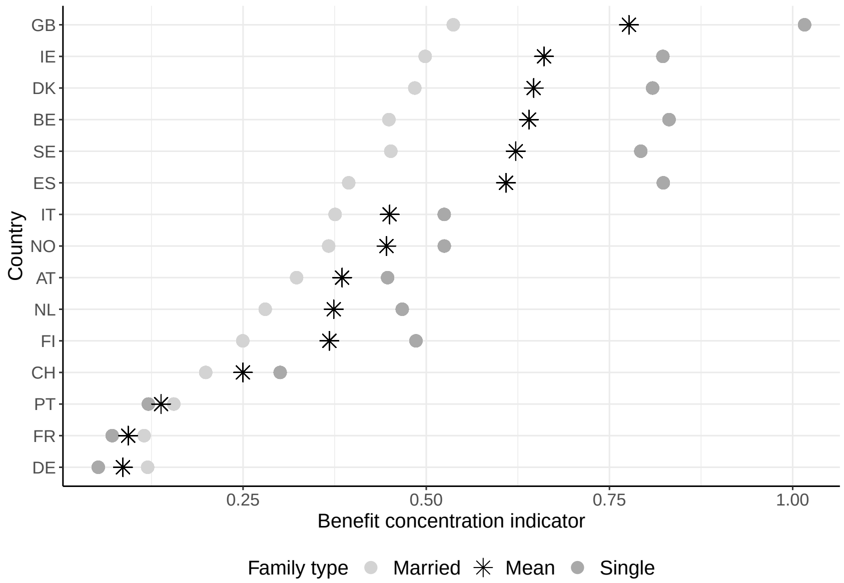
To calculate the area under the curve for low-income earners, I set b equal to 75 per cent of the average wage (AW) and a equal to AW 50 per cent. For high-income earners, I set b equal to AW 200 per cent and a equal to AW 175 per cent. I partition the integration interval into $N = 25$ equally spaced panels (1 per cent steps), capturing the replacement rates for AW 50, AW 51 ... up to AW 75 in the low-income group, and AW 170, AW 171 .. up to AW 200 in the high-income group. For each income group, I calculate two areas, one under the observed curve based on given replacement rates in a country-year and family-type (Area A), and one under the hypothetical curve with proportional benefits (Area B). With perfect proportionality, the difference between the two areas would be 0 for both groups. I calculate distortion from proportionality with the following formulae: $(B - A)/B$. In order to compute the benefit concentration coefficient in the next step, I subtract the difference between the two areas calculated for low-income group from the difference between the two areas calculated for the high-income group. I repeat the same procedure for the two prototypical family types married couple with 2 children (gross earning spouse 67% of AW) and single with no children and for each country and each year.

For illustration, a single with no children who earns 50% of the average wage in Austria in 2002 receives benefits that replace 65.58% of her previous income in the case of unemployment. The same person who earns 51% of the average wage gets 64.53% of her previous income replaced. The same calculation is being made up to 75% of the average wage. Replacement rates for one family type at various positions in the income distribution allow me to calculate the area under the curve for the given family type in the low-income group in Austria in 2002. In order to calculate the area under the proportionality curve, I take the average of the replacement rates received among those earning 50% up to 75% of the average wage. I then subtract the observed area from the proportionality area $(B - A)$ and divide the result by the proportionality area (B). I repeat the same for high-income earners (175% to 200% of the AW), and subtract the resulting distortion in the low-income group from the resulting distortion in the high-income group. With the given example, this results in a benefit concentration indicator of 0.43 for a single with no children in Austria in 2002.

Taken together, the benefit concentration indicator gives me an approximation of the social insurance principle. Higher values indicate stronger conformity with the flat-rate principle (where everyone receives the same total amount of benefits and, consequently, replacement rates are declining as income increases), values that get close to 0 indicate a stronger conformity with the earnings-related principle (benefits are proportional to previous earnings and, consequently, replacement rates are constant over the income distribution). My focus then lies on structural differences in the provision of social insurance across income groups, but does not incorporate level differences in the replacement rate.

Figure B.5 reports the benefit concentration indicator for two prototypical family

Figure B.5: Benefit concentration indicator across Western European countries.



types married couple with 2 children (gross earning spouse 67% of AW) and single with no children for each country and averaged over the over the years 2002-2014 (there is no institutional reform in any of the countries under the observation period which would substantially alter the structure of replacement rates within countries). In the main analysis, I rely on the mean value of the two family types. As the figure shows, the ranking of countries is very comparable when looking at each family type separately[4].

B.3 Caveats

I use the benefit concentration indicator as an approximated measure for structural differences in the governing principle of social insurance. The focus is on unemployment benefit entitlement as an approximation for future income equalization given uniform labor market risk exposure. The approach comes with several limitations. I briefly discuss two major caveats. First, the focus on unemployment benefits ignores the institutional structure of other social policy programs and components of the welfare state, such as sickness benefits and old-age pensions, labor market protection, and active labor market policies. Unemployment benefits are only one program which influences the stability of given income differences in future periods. Second, calculations are based on one prototypical individual with a given age and a complete employment history. It therefore ignores differences in the bases of entitlement and the payment period (unemployed individuals in Germany, for example, receive earnings-related benefits in the first period of unemployment, but receive social assistance, which essentially means flat-rate benefits, if they are long-term unemployed). Changes in the assumptions about the prototypical

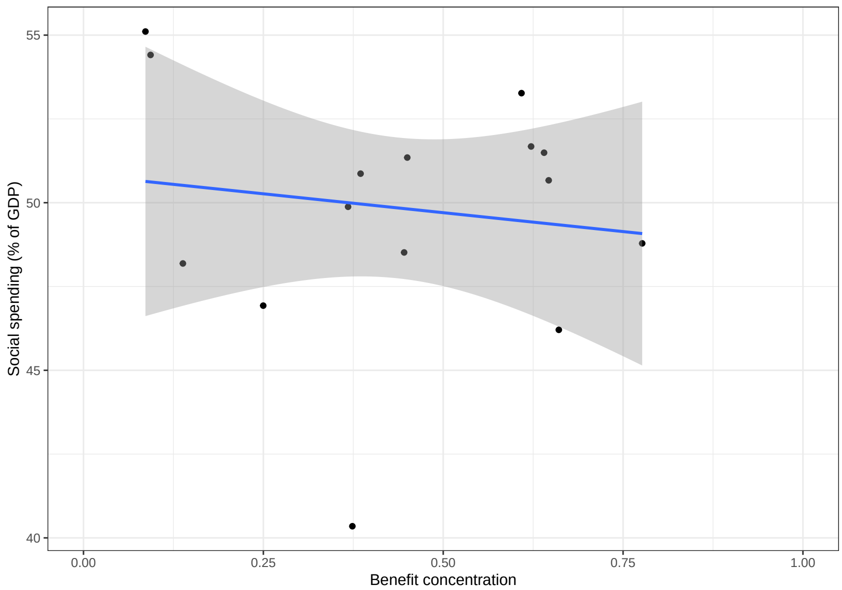
4. Patterns for the aggregated indicator are in the main text.

earner can have very different implications across the countries (e.g. benefits in Sweden are flat-rate if an individual is not contributing to a voluntary fund.

B.4 Comparison to Alternative Measures

In this section, I compare how the benefits concentration indicator compares to alternative measures of welfare state effort and indicators capturing differences in the configurations of the welfare state.

Figure B.6: Benefit concentration and social spending (% of GDP), averaged over 2002-2014.

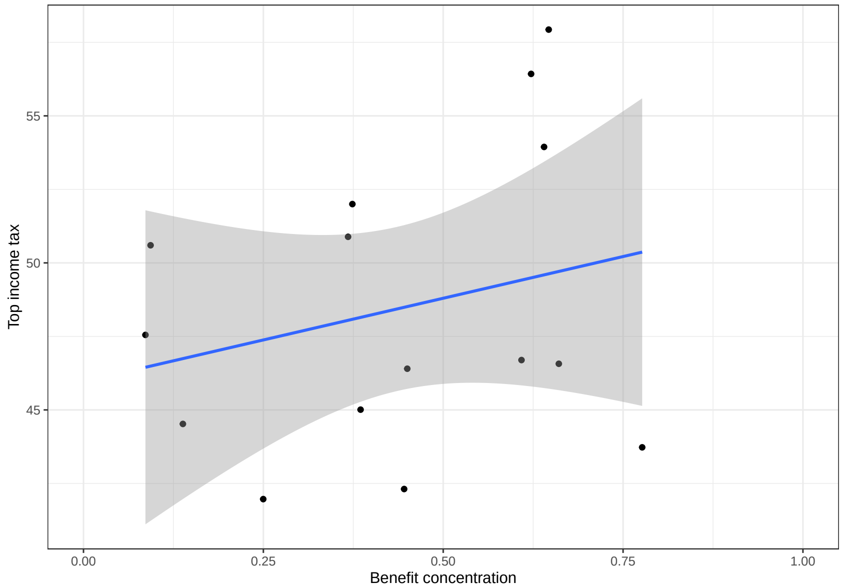


and social spending in percentage of total government spending (provided by the OECD). Social spending is lower in welfare states that more closely follow the flat-rate principle in the arrangement of social insurance (Pearson's r = −.1971 with a p-value $< .001$). Nevertheless, the plot also reveals substantial variation in social spending at any given level of benefit concentration. This indicates that the benefit concentration indicator captures variation that is hidden by aggregate spending measures.

In Figure B.7, I relate the benefit concentration indicator to the top statutory personal income tax rate (provided by the OECD) as another measure for welfare state effort. The top income tax is higher in welfare states that more closely follow the flat-rate principle (Pearson's r = .1864 with a p-value $< .001$). As before, the plot also reveals substantial variation in the top income tax at any given level of benefit concentration.

Figure B.8 plots the relationship between the benefit concentration indicator and total fiscal redistribution via transfer. The indicator is calculated by Mahler and Jesuit (2006) and measures the redistributive effect of gross transfers. Mahler and Jesuit (2006) take data from 59 LIS (Luxembourg Income Study) surveys for 13 developed countries covering

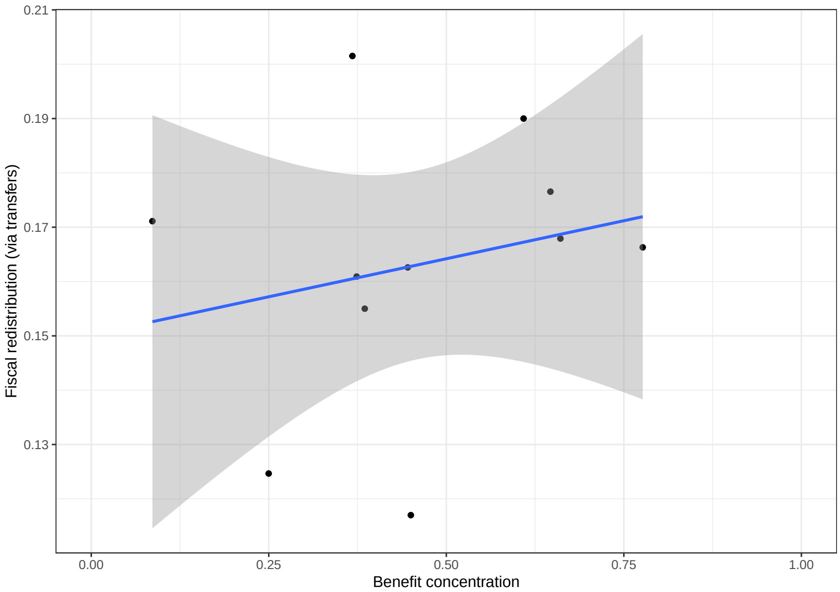
Figure B.7: Benefit concentration and top statutory personal income tax rate, averaged over 2002-2014.



the period between 1979 and 2000. I use average values and relate them to the benefit concentration indicator. Although this is another outcome-based measure, it captures the income-equalizing effect of transfers rather than general spending, and therefore could give some indication of how transfers are structured. Fiscal redistribution via transfers is higher in welfare states that more closely approximate the flat-rate principle (Pearson's r = .1932 with a p-value $< .001$). Yet, the benefit concentration indicator still carries information that is not captured by fiscal redistribution via transfers. Some countries with social insurance systems that closely follow the earnings-related principle achieve much higher fiscal redistribution than others with a very comparable value on the benefit concentration indicator.

Figure B.9 shows the relationship between the benefit concentration indicator and the internal target efficiency of social benefits. Target efficiency captures the extent to which benefits are targeted towards low-income groups by means-testing. The indicator takes the value -1.0 if the poorest person gets all transfer income. The measure is provided by Mahler and Jesuit (2006). The plot reveals that welfare states that more closely follow the flat-rate principle also more likely target benefits towards the poor (Pearson's r = $-.3227$ with a p-value $< .001$). This pattern is fairly strong and very much confirms the Paradox of Redistribution (Korpi and Palme 1998). Yet, there is still variation in the benefit concentration indicator that is not explained by target efficiency, as can be seen in the plot.

Figure B.8: Benefit concentration and fiscal redistribution achieved via transfers.



C Observational Analysis

C.1 Descriptive Statistics

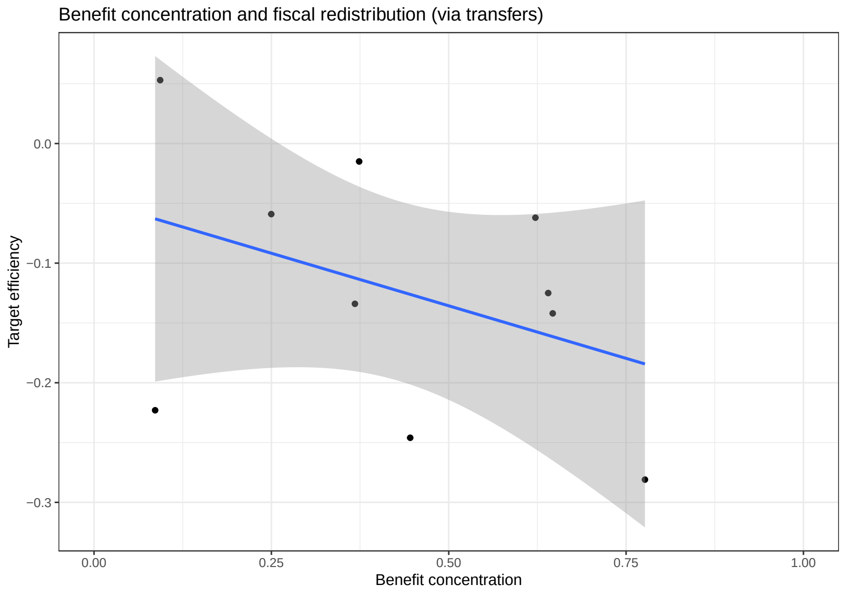
Table C.4 provides summary statistics of the variables included in the analysis. I compare between the combined imputed data and listwise deletion. Differences are minor. The following analyses are based on the five combined imputed data sets.

C.2 Regression Analysis

Table C.5 shows the result of a basic linear regression. Support for redistribution clearly relates to the institutional arrangement of social insurance. Regression results indicate that average support for redistribution among those who earn more than the average earner is lower in countries more closely following the flat-rate principle (measured in high benefit concentration). The relationship holds when controlling for risk exposure (occupational unemployment risk among above-average earners), age, education (in years), single, gender, unemployment, levels of inequality (gini in disposable income), immigration (foreign-born population), social spending (% of GDP), top statutory personal income tax rate, and total fiscal redistribution via transfer (see Mahler and Jesuit (2006)). I further include year fixed-effects.

Average support for redistribution increases from an expected mean value of 3.556 units (sd: 0.012) in the UK (the country with the highest level of benefit concentration and most closely associated with the flat-rate principle) to an expected mean value of 3.725 units (sd: 0.012) in Germany (the country with the lowest level of benefit concentration and most closely associated with the earnings-related principle). The expected mean value

Figure B.9: Benefit concentration and internal target efficiency of social benefits.



of support for redistribution is 3.642 (sd: 0.010) for countries with a mean level of benefit concentration, and decreases to 3.586 (sd: 0.011) when moving one standard deviation up in benefit concentration. Expected values are calculated based on Model 5 in Table C.5.

While this analysis lends support to the general relationship between support for redistribution and benefit concentration, the inference we can draw from this analysis is limited. The main explanatory variable (benefit concentration indicator) is defined on the country-level. This is because there is no systematic variation within countries (the insurance system logic rarely changes). Data limitations (and the fact that institutions are fairly rigid) and issues related to causality make it difficult to get closer at the causal mechanism I am interested in. My main empirical focus therefore lies on the experiment.

C.3 Benefit Concentration and Fairness Beliefs

My argument goes beyond the idea that cross-national differences in fairness beliefs explain why the rich in some European welfare states support higher levels of redistribution than the rich in other European welfare states (see the argument by Alesina and Angeletos 2005). The point I make is that for similar fairness beliefs, support for redistribution is higher in Bismarckian compared to Beveridgean systems. This leads to several empirical implications that require more attention. Most importantly, given that Bismarckian systems reproduce existing inequalities per design, leading to arguably more rigid societal structures in Bismarckian compared to Beveridgean systems, and further assuming that intergenerational mobility influences fairness beliefs (a link that is made most prominently by Alesina, Stantcheva, and Teso 2018), fairness beliefs might indeed vary systematically across European welfare states. In other words, the rich in Bismarckian systems might be

Table C.4: Descriptive statistics. Means, standard deviations, and percentages.

	Imputed		**Listwise**	
Continuous	Mean	SD	Mean	SD
Redistribution	3.75	1.05	3.73	1.06
$Income[1,000PPPUSD]^a$	36.69	28.34	37.41	28.26
Income distance	0.00	27.18	0.52	26.97
$Occupationalunemployment[in\%]^a$	0.07	0.06	0.06	0.06
Age [in years]	48.16	18.52	49.01	17.11
Education [in years]	12.41	4.30	12.75	4.20
Benefit concentration	0.43	0.23	0.43	0.23
Gini(disposable income)	28.59	3.42	28.17	3.30
$Immigration^b$	11.69	4.93	11.56	4.94
Social spending	49.99	4.39	49.82	4.42
Top tax	48.50	5.53	48.75	5.67
Redistribution via transfers	0.16	0.02	0.17	0.02
Dichotomous	%		%	
Single	22.54		18.75	
Female	52.36		50.63	
Unemployed	4.16		4.03	

[a] Variable has imputed missing values. Income (1,000s PPP USD): 18.69%, Unemployment risk: 17.32%.
[b] Share of the foreign born population.
Imputed statistics are based on the combined multiple imputed data sets.

more likely to believe that effort does not pay than the rich in Beveridgean welfare states. Nevertheless, my argument is that differences in how social insurance systems respond to labor market shocks influence the stability of fair and unfair income differences, and that this matters for redistribution preferences even when holding cross-country differences in fairness beliefs constant.

In order to assess these two aspects empirically, I add an additional analysis using data from the Eurobarometer (EB). Other than the European Social Survey, the EB includes questions on fairness beliefs and on redistribution preferences in one module (December 2017), and covers the same countries I include in the ESS analysis, except for Norway and Switzerland. I use these data, even though limited with regard to the time period covered, to provide some insight on the distribution of fairness beliefs across European welfare states on the one hand, and on the relationship between differences in the institutional arrangement of social insurance (benefit concentration) and redistribution preferences on the other hand.

The EB asks people how important several aspects are for getting ahead in life. The aspects I focus on are: 1) Coming from a wealthy family; 2) Knowing the right people; and 3) Working hard. Those items are measured on a 5-point scale going from essential to not important at all. I reverse answer categories such that higher values reflect that the

Table C.5: Linear regression: Support for redistribution and benefit concentration

	Model 1	Model 2	Model 3
Intercept	3.63^{***}	3.34^{***}	4.63^{***}
	(0.01)	(0.03)	(0.23)
Benefit concentration	-0.33^{***}	-0.24^{***}	-0.42^{***}
	(0.02)	(0.02)	(0.06)
Occu. unemployment		3.40^{***}	2.99^{***}
		(0.08)	(0.21)
Age		0.00^{***}	0.00^{***}
		(0.00)	(0.00)
Education		-0.01^{***}	-0.02^{***}
		(0.00)	(0.00)
Single		0.05^{***}	0.08^{***}
		(0.01)	(0.03)
Female		0.21^{***}	0.21^{***}
		(0.01)	(0.02)
Unemployment		0.18^{***}	0.20^{***}
		(0.03)	(0.06)
Gini (disposable income)			0.04^{***}
			(0.00)
Immigration			-0.02^{***}
			(0.00)
Social Spending			-0.03^{***}
			(0.00)
Top Tax			-0.03^{***}
			(0.00)
Redistribution via transfers			5.68^{***}
			(0.56)
Year fixed-effects	yes	yes	yes
R^2	0.01	0.05	0.07
Adj. R^2	0.01	0.05	0.07
Num. obs.	73365	73365	15133

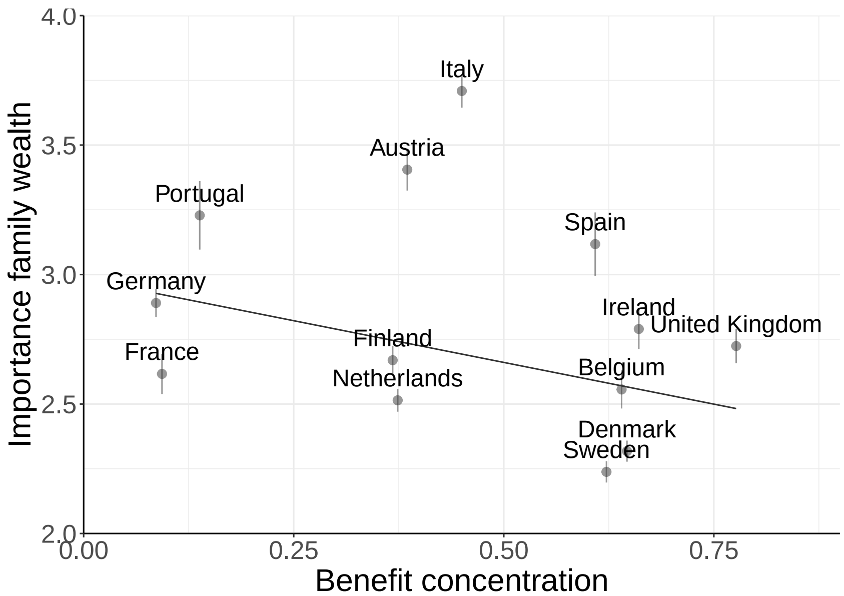
Note: Estimations are based on one fully imputed data frame.

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

respective aspect is essential for getting ahead in life. The EB includes the same question capturing redistribution preferences as the ESS, asking respondent whether they agree or disagree to the statement that the government should take measures to reduce differences in income levels. The item is measured on a 5-point strongly agree to strongly disagree scale. I reverse the scale such that high values correspond to strong agreement. Finally, the EB asks respondents for their after tax annual household income. Individuals choose one of five categories that capture country specific quintiles. The EB further asks respondents for age, gender, political ideology, periods of unemployment, and household composition. As before, I restrict the analysis to the rich and include only those respondents in the upper two income quintiles.

In the following, I first plot the relationship between fairness beliefs and structural differences in the social insurance design to assess whether fairness beliefs vary systematically across European welfare states. And second, I assess whether the relationship between benefit concentration and support for redistribution remains important when holding differences in fairness beliefs constant.

Figure C.10: Benefit concentration and beliefs in the importance of coming from a wealthy family.



Figures C.10:C.12 plot the relationships between the benefit concentration indicator and fairness beliefs. Figure C.10 and Figure C.11 show that the rich, on average, are more likely to believe that it is essential to come from a wealthy family and to know the right people if benefits are less concentrated to the poor (approximating the earnings-related principle), and less likely to believe that hard work pays (Figure C.12). Those bivariate relationships suggest that differences in the institutional arrangement of social insurance indeed relate to differences in fairness beliefs. People appear to be more likely to believe that factors related to luck matter more for getting ahead in life than factors related to

Figure C.11: Benefit concentration and beliefs in the importance of knowing the right people.

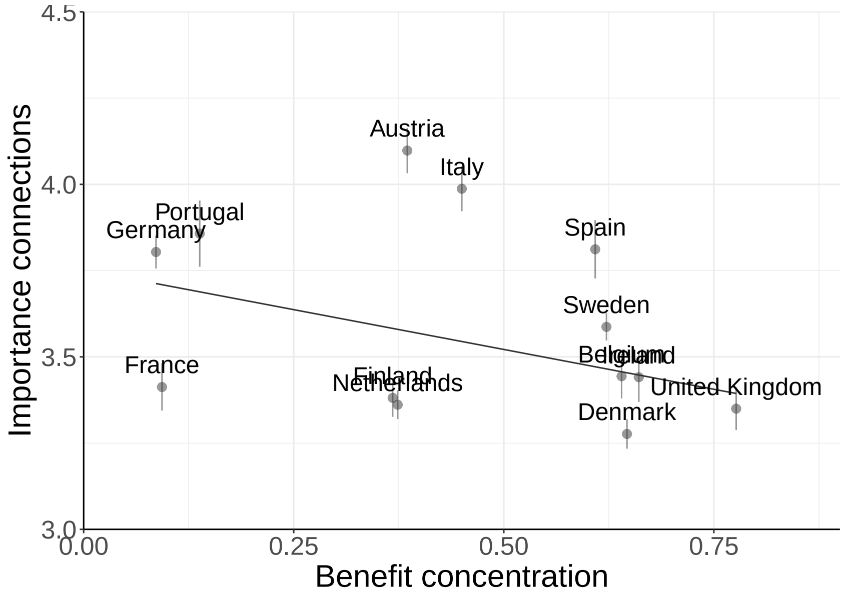
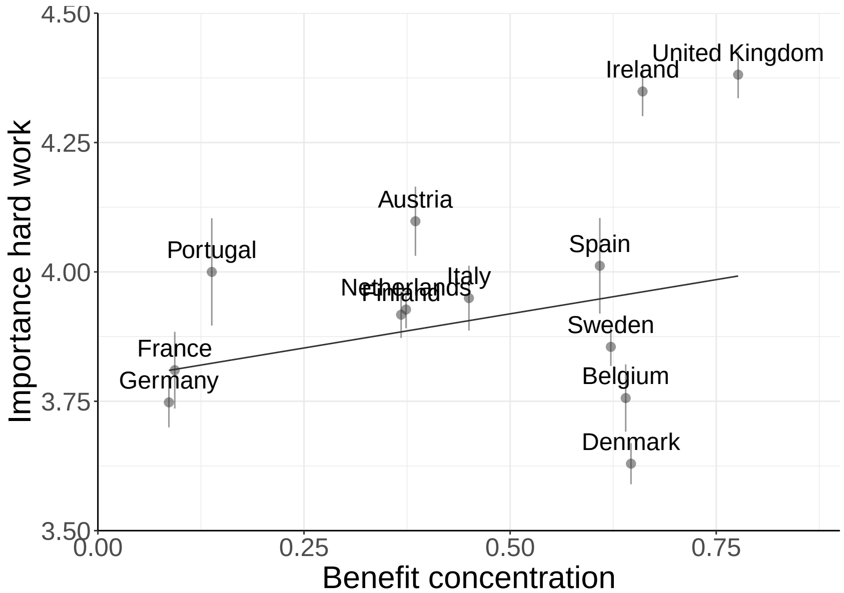


Figure C.12: Benefit concentration and beliefs in the importance of working hard.



effort if the welfare state is designed towards reproducing existing societal hierarchies.

Important for the argument I am making in this article is the question whether differences in the social insurance design still matter when holding fairness beliefs constant.

Table C.6 shows the results of a basic linear regression including fairness beliefs and benefit concentration. Support for redistribution clearly relates to the institutional arrangement of social insurance when holding fairness beliefs constant. These results support the idea that the institutional arrangement of social insurance influences redistribution preferences via considerations of future income dynamics, and this goes beyond differences in average fairness beliefs.

Table C.6: Linear regression: Support for redistribution, fairness beliefs and benefit concentration

	Model 1
(Intercept)	4.43^*
	$[4.07; 4.79]$
Benefit concentration	-0.68^*
	$[-0.85; -0.51]$
Wealthy family	0.16^*
	$[0.12; 0.20]$
Connections	0.09^*
	$[0.04; 0.14]$
Working hard	-0.02
	$[-0.07; 0.03]$
Age	0.00^*
	$[0.00; 0.01]$
Female	0.16^*
	$[0.08; 0.23]$
Education	-0.10^*
	$[-0.15; -0.05]$
Leftright	-0.17^*
	$[-0.19; -0.15]$
Single	-0.15^*
	$[-0.28; -0.02]$
Unemployed	0.27
	$[-1.02; 1.55]$
R^2	0.17
Adj. R^2	0.17
Num. obs.	3020
RMSE	1.04

* 0 outside the confidence interval.

D Experimental Section

D.1 Experimental Procedure

Each session begins with familiarizing students with the instructions. It then proceeds with the following three parts. Part one is the allocation game. Subjects are randomly assigned to the role of the decision-maker or recipient and go through 16 rounds of allocation decisions. Part two is a standard risk elicitation task based on Holt and Laury (2002). Finally, the experiment ends with a short survey in part three.

Before entering part one of the experiment, subjects go through the instructions individually on their screens[5]. In addition, instructions are provided in print[6]. Instructions on the screens introduce visualizations of the allocation problems[7]. An abstract language is used, so that participants do not find themselves in a labor market situation with unemployment risk and social insurance provision. Differences in the institutional arrangement of the social insurance principle are not mentioned. Euros are converted to the experimental currency Tokens, with 1,000 Tokens corresponding to 1 Euro.

Part one is structured as follows. A coin flip divides subjects into decision-maker and recipient. Subjects are informed about their role and stay in the same role throughout the first part of the experiment. Each participant goes through a testing round which does not influence final payoffs. At the end of the testing round, subjects are encouraged to ask questions to resolve ambiguities in the decision tasks. A sequence of 16 allocation problems follows. The sequence of these problems follows a random order for each session. In each round of the sequence, the specific allocation problem is illustrated on the first screen. On the next screen, decision-makers make a transfer decision by moving a slider. Subjects must move the slider at least once before entering the next screen. Recipients indicate their preferred level of transfers at the same time on a similar looking screen. The next screen visualizes possible outcomes after the realization of the lottery. At this point subjects are allowed to move back and adjust their decision or preference. After subjects make their decision in the respective situation, the computer realizes the lottery by drawing a random number. For example, if the risk of loss is 20 per cent, subjects keep their endowment if the random number is anything below 80, but lose it if it is between 80 and 100. Subjects see the outcome of the lottery visualized on their screens. The next allocation problem follows. A decision-maker is randomly matched with an anonymous recipient in each allocation problem. One outcome of part one is chosen randomly for each subject and adds to the final payment. Allocation problems are independent and outcomes from one allocation problem are not transferred to another one[8].

After finishing part one, subjects read instructions for part two on their screens. Part two elicits risk preferences based on Holt and Laury (2002) choice sets between more and less risky lotteries. One random decision is realized and adds to final payments.

The experiment ends with a questionnaire. Subjects answer questions on socio-demographics, and specific questions about the experiment[9]. Final payoffs are calculated

5. There is no strategic interaction in the experiment. Instructions are introduced before subjects enter their roles. Thus, all instructions are common information. Going through the instructions individually allows subjects to determine their own pace.

6. Instructions are in Section D.2.

7. Screens are in Section D.3.

8. The 16 allocation problems neither simulate a life-cycle, nor do they allow to accumulate wealth. The life-cycle argument is reduced to the before and after lottery outcome in each situation.

9. The questionnaire and summary statistics are in Section D.4, and in Table D.7 in Section D.5 respectively.

based on outcomes in part one and part two of the experiment. In addition, each subject receives a show-up fee of 4 Euros. The experimenter hands out payments discretely. The experiment ends.

D.2 Instructions

Welcome!

This is an experiment on decision-making. Your responses to different decision situations influence your final payment. Your decisions, or the decisions by other participants, influence one part of your final payoff, luck influences the other part. You receive your payment in cash at the end of the experiment.

Payments are handed out anonymously. Other participants will neither learn about your payoff nor about your responses to the decision situations.

We ask you to carefully read the following instructions in order to be able to correctly evaluate the following decision-situations, and the potential gains in each situation.

Please do not communicate with other participants during the experiment. Raise your hand if you have any questions. Please remain seated until the end of the experiment.

During the experiment, we report your potential gains in Tokens. At the end of the experiment, we convert Tokens to Euros.

General

You will face various decision situations during the course of this experiment. Some of these situations include risk. Risk is presented in terms of lotteries. The outcome of each decision situation is therefore determined by your own decision, or the decision of another participant, and, in some cases, by lotteries. The computer draws a random number in order to realize a lottery. The computer draw determines whether or not you receive the amount that is attached to the lottery.

The experiment consists of two parts and a short survey. We now introduce you to the first part.

Part One

1. **Decision-making**
   In the first part of the experiment, we divide you randomly into groups of two participants. You will face 16 decision situations. One participants takes the role of the decision-maker, the other participant takes the role of the recipient. Each situation asks the decision-maker to divide a given amount of Tokens between themselves and the other participant. The total amount of Tokens varies across decision-situations. The decision-maker always receives a higher amount of Tokens than the recipient.

They decide whether they want to make transfers to the recipient, and, if so, how high the transfers should be. This means that the decision-maker can equalize given differences in the amount of Tokens that each participant receives. These shares determine the payments at the end of the experiment. In other words, the decision-makers influences differences in payments.

2. **Lotteries**
   Some situations expose your share of the total amount to lotteries. This is independent of your role in the decision-making process. Lotteries induce risk to your share. You may lose parts of your share of the total amount. You are hit by a shock. The probability for a shock varies across decision-situations. Probabilities for decision-maker and recipient are independent of each other.

3. **Protection**
   Your share of the total amount is protected against the risk of a shock. The protection replaces parts of your share in the case that you are hit by a shock. For example, 80 per cent of your share may be protected. This means, if you are hit by a shock, you still receive 80 per cent of your share of the total amount in the given decision situation. Your protection is independent of the protection that the other participant receives.

Lotteries and Protection

Let us combine lotteries and protection. One situation could look as follows. The decision-maker receives a given amount of Tokens, let us say 6,000 Tokens. 20 per cent of this amount are protected against a shock. The probability for the shock is 2.5 per cent. If the shock hits, the decision-maker receives a replacement of 1,200 Tokens, as defined by the protection. Put differently, 20 per cent of the share are safe. The decision-maker keeps the full amount of 6,000 Tokens with a probability of 97.5 per cent.

The recipient receives a smaller amount, let us say 1,000 Tokens. 80 per cent of this amount are protected against a shock. The probability for the shock is 20 per cent. If the shock hits, the recipient receives a replacement of 800 Tokens (80 per cent of the share are safe). The recipient keeps the full amount of 1,000 Tokens with a probability of 80 per cent.

Total Amount

Put together, each decision situation in this experiment is defined by the components 1) total amount of Tokens, 2) decision-maker and recipient shares of this amount, 3) probability for a shock, 4) the protection that defines the rate of replacement in the case of a shock. The figure on the screen illustrates the constellation of the total amount in a given situation.

Without a shock, the decision-maker receives the dark green and the light green parts of the total amount. The recipient receives the dark blue and the light blue parts. In the case of a shock, the decision-maker loses the light green part and keeps the dark green part. If the recipient is hit by a shock as well, he or she loses the light blue part and keep the dark blue part. Each part is marked with the amount of Tokens attached to it and the probability of loss. The dark parts are always marked as "safe".

Decision Situation

Another screen illustrates all possible outcomes of a given situations. Subsequently, the decision-maker decides whether he or she wants to make transfers to the recipient, and how high these transfers should be. Transfers are made with a slider. The slider updates the composition of the total amount.

The probability of a shock and the corresponding protection are independent of the transfer decision and are applied to the share of the total amount that the decision-maker holds after the transfer decision. The probability of a shock does not change for the recipient. However, the transferred amount is added to the safe part of the respective share of the total amount.

While decision-makers take their transfer decision, recipients use the slider to indicate their preferred distribution of the total amount. This has no impact on the outcome of a situation. Only the transfer decision of the decision-maker influences the distribution of the total amount and, therewith, the payments at the end of the experiment.

Lottery Realization

The computer draws a random number between 1 and 100 and realizes the lottery for decision-maker and recipient. Consider the following example. You are in the role of the decision-maker and receive 6,000 Tokens. With a probability of 2.5 per cent you lose 80 per cent of your share and receive 1,200 Tokens. If the computer draws the number 2.5 or smaller, you lose, otherwise (computer draws a number larger than 2.5), you win and keep your share of 6,000 Tokens.

The screen illustrates a situation in which the recipient is hit by a shock. This correspondents to Outcome C on the outcome screen. The protection replaces 80 per cent of the share. The decision-maker is not hit by the shock and keeps the total share.

Roles

The computer flips a fair coin which decides whether you are in the role of the decision-maker or in the role of the recipient. You keep the same role during the whole experiment.

The groups (decision-maker and recipient) are randomly assigned after each decision situation.

If you are in the role of the decision-maker, you will see a green batch on the right upper corner of your screen. Otherwise, you will see a blue batch instead.

Payments

Payments for decision-makers are defined by 1) the share of the total amount in a randomly chosen decision situation, after the transfer decision and after the realization of the lottery, 2) the outcome of a randomly chosen situation from the second part of the experiment, and 3) the participation fee.

The same holds for the recipient but with the difference that only the decision-maker influences the share of the total amount in 1).

We now begin with a practice round. The practice round has no impact on your final payments. Please raise your hand if you have any questions. We come to your place.

Instructions for the second part appear on your screen after the first part is completed.

You will know your role for the first part of the experiment after clicking "next". You stay in the same role after the practice round.

D.3 Screens

Figure D.13: Screen situation.

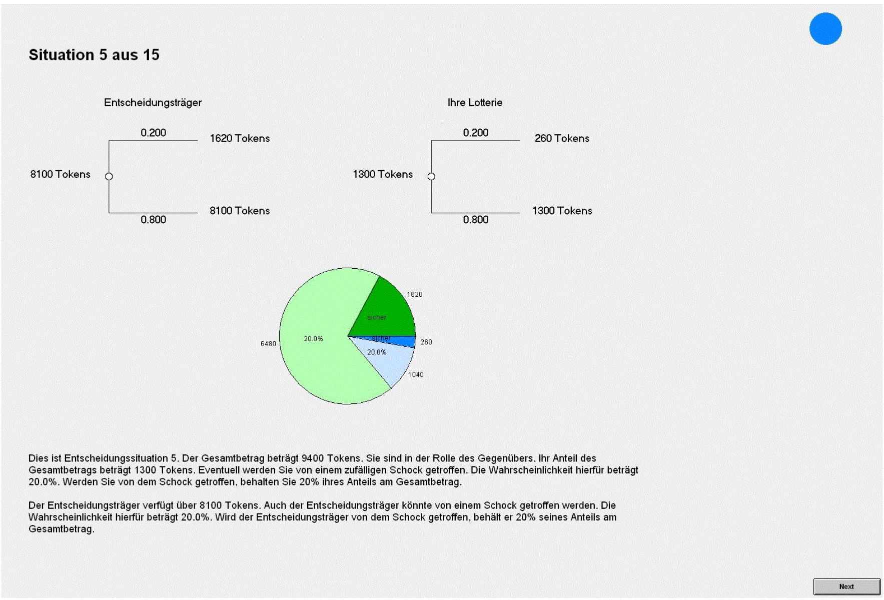


Figure D.14: Screen outcomes.

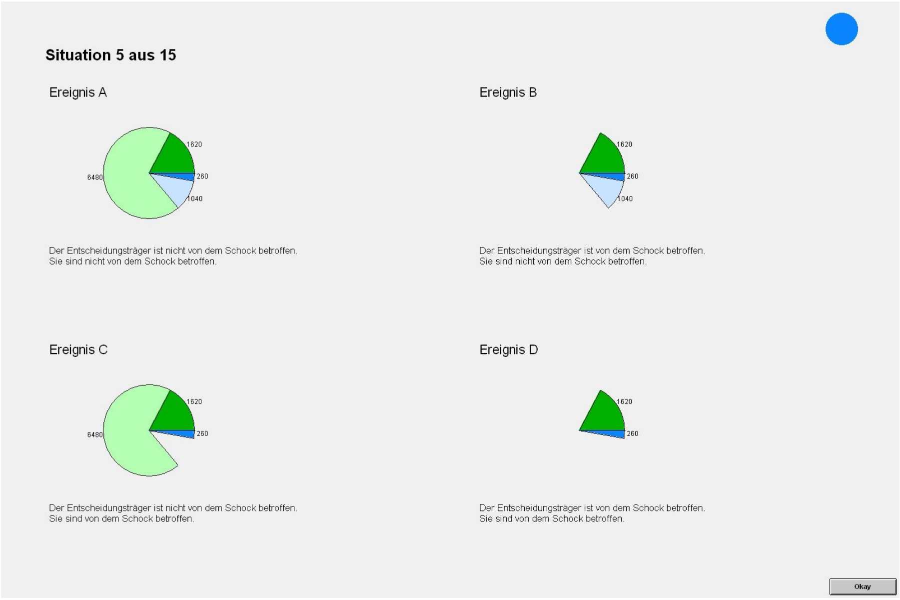
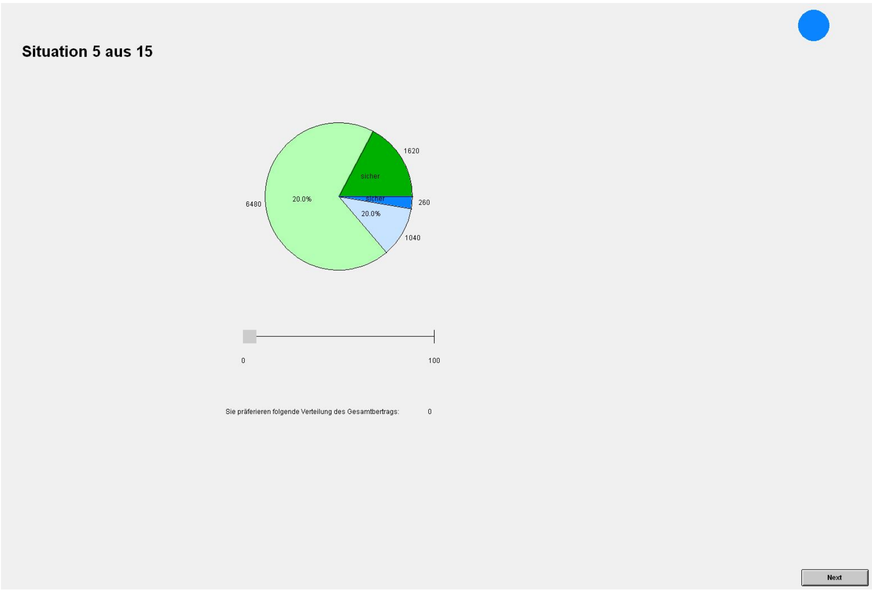


Figure D.15: Screen decision.



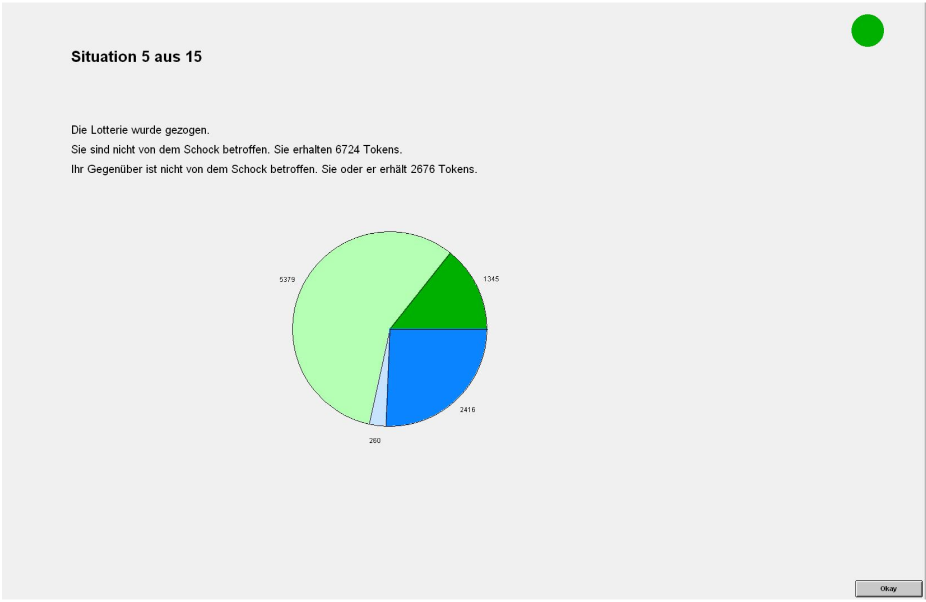
Graph D.13 to Graph D.16 show the screenshots for one specific situation in the allocation game. Screens in the decision-making phase look the same for decision-makers and recipients. Outcomes are based on decision-maker allocation decisions[10].

D.4 Survey Questions

The post-experiment questionnaire included the following questions. Participants were informed that they could skip any question that they did not wish to answer.

10. The screens I illustrate here show one of the 16 allocation problems in Table **??** in the main text.

Figure D.16: Screen lottery draw.



1. How old are you? (free text)

2. What is your major subject? (free text)

3. What is your sex? (2 nominal choices)

4. Are you member of a religious community? (yes/no)

5. If yes, which one? (free text)

6. Which of the descriptions comes closest to how you feel about your family's income nowadays? (5 point scale)

7. How interested would you say you are in politics? (4 point scale)

8. In politics people sometimes talk of "left" and "right", where would you place yourself on this scale, where 0 means left and 10 means right? (10 point scale)

9. Which party would you vote for if the parliamentary election was this Sunday? (free text)

10. Now thinking about the government in Berlin, how satisfied are you with the way it is doing its job? (10 point scale)

11. To what extent do you agree with the statement that the government should take measures to reduce differences in income levels? (5 point scale)

12. How important is it to you that every person in the world should be treated equally, and that everyone should have equal opportunities in life? (7 point scale)

13. How important is it to you to be very successful, and that people recognize your achievements? (7 point scale)

14. Thinking about the experiment again, how easy was it for you to understand the instructions? (10 point scale)

15. If you could participate again, would you make changes in your overall transfer decisions? (5 point scale)

16. Why would you make changes? (free text)

D.5 Descriptive Statistics Experiment

Table D.7: Descriptive statistics. Means, standard deviations, and percentages.

Continuous	N	Min	Max	Mean	SD
Age	170	18.00	59.00	22.73	4.56
Family income	170	1.00	5.00	2.35	0.87
Redistribution	170	1.00	5.00	2.44	0.98
Interested in politics	170	1.00	4.00	2.06	0.83
Leftright	171	1.00	10.00	5.30	1.71
Instructions	173	1.00	9.00	2.88	2.10
Make changes in transfer decisions	174	1.00	6.00	4.97	1.23
Number of clicks (transfer decision)	174	1.00	46.00	4.04	3.84
Dichotomous	N		%		
Female	174		53		
Member religious community	172		49		

Table D.7 contains information on socioeconomic background for all participants, as well as political attitudes and experiment-specific questions.

D.6 Average Transfers

Figure D.17 illustrates average transfers across decision-makers.

D.7 Social Insurance Principle and Selfish Participants

Figure D.18 replicates Figure 4 in the main text but for those 37 participants which I categorize into selfish types. Two important patterns can be detected. First, average transfers are close to zero in all six allocation problems. And second, transfer shares in Panel (b) and Panel (c) are higher in the flat-rate relative to the earnings-related allocation problem. These differences are statistically significantly different from zero, but driven by only a few observations. One rational for the reversed relationship is that transfers to the recipient increase welfare gains (recipients get the transferred units for sure).

Figure D.17: Average transfers by decision-makers.

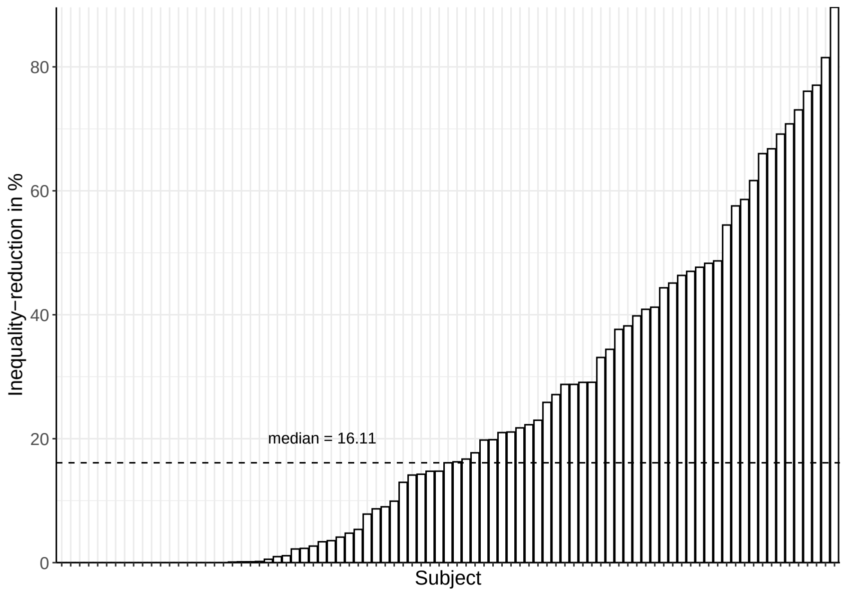
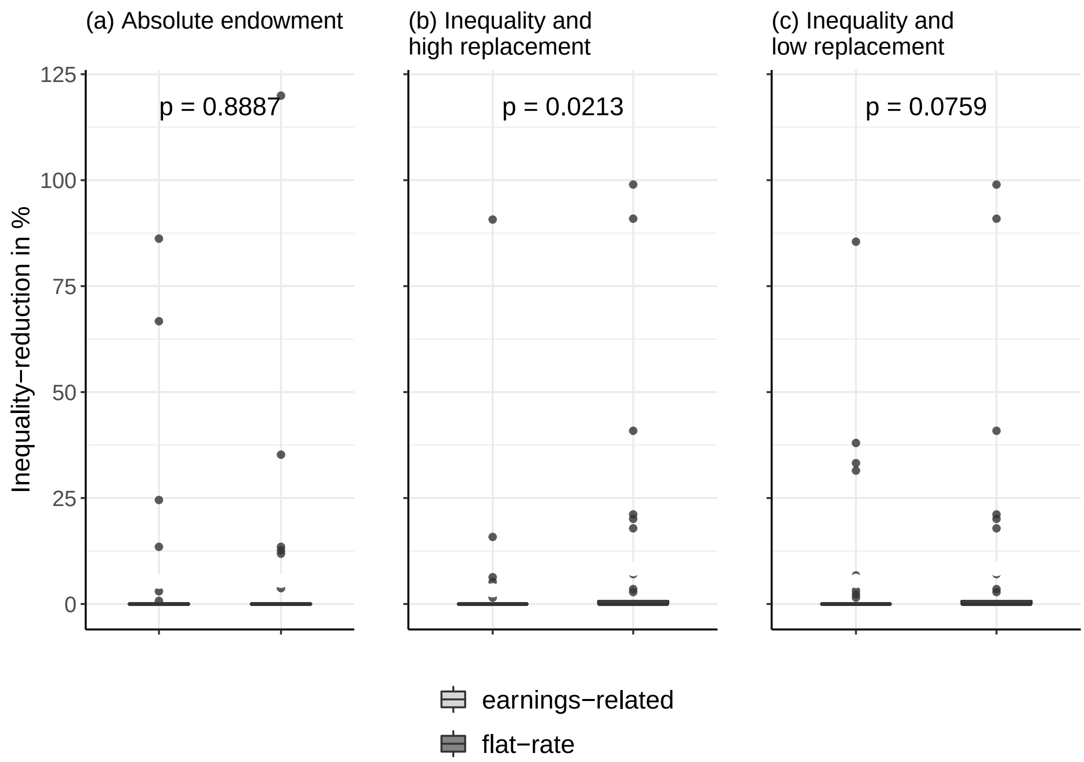


Figure D.18: Effect of social insurance principle on transfers among selfish participants.



Note: Panel (a) compares transfers in AP 2 vs. 9 (in Table 1 in the main text), panel (b) compares transfers in AP 8 vs. AP 13, and panel (c) compares transfers in AP 6 vs 13.

References

Alesina, A, and GM Angeletos. 2005. "Fairness and Redistribution." *American Economic Review* 95 (4): 960–980.

Alesina, A, S Stantcheva, and E Teso. 2018. "Intergenerational Mobility and Preferences for Redistribution." *American Economic Review* 108 (2): 521–54.

Holt, CA, and SK Laury. 2002. "Risk Aversion and Incentive Effects." *American economic review* 92 (5): 1644–1655.

Honaker, J, and G King. 2010. "What to Do about Missing Values in Time-series Cross-section Data." *American journal of political science* 54 (2): 561–581.

Hout, M. 2004. *Getting the Most out of the GSS Income Measures.* National Opinion Research Center Chicago.

King, G, J Honaker, A Joseph, and K Scheve. 2001. "Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation." *American Political Science Review* 95 (1): 49–69.

Kopczuk, W, E Saez, and J Song. 2010. "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937." *The Quarterly Journal of Economics* 125 (1): 91–128.

Korpi, W, and J Palme. 1998. "The Paradox of Redistribution and Strategies of Equality: Welfare State Institutions, Inequality, and Poverty in the Western Countries." *American Sociological Review* 63 (5): 661–687.

Mahler, VA, and DK Jesuit. 2006. "Fiscal Redistribution in the Developed Countries: New Insights from the Luxembourg Income Study." *Socio-Economic Review* 4 (3): 483–511.

Rehm, P. 2011. "Social Policy by Popular Demand." *World Politics* 63 (02): 271–299.

Rubin, DB. 1987. *Multiple Imputation for Nonresponse in Surveys.* Wiley Series in Probability and Mathematical Statistics Applied Probability and Statistics. New York, NY [u.a.: Wiley.

Rueda, D. 2018. "Food Comes First, Then Morals: Redistribution Preferences, Parochial Altruism, and Immigration in Western Europe." *The Journal of Politics* 80 (1): 225–239.

Rueda, D, and D Stegmueller. 2016. "The Externalities of Inequality: Fear of Crime and Preferences for Redistribution in Western Europe." *American Journal of Political Science* 60 (2): 472–489.