

Why Some Care More About Free Riding Than Others and Why It Matters

Online Appendix

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A. The Structure of Tax/Spend Preferences: ESS Analysis

A.1. Socio-Economic Variables: Overview

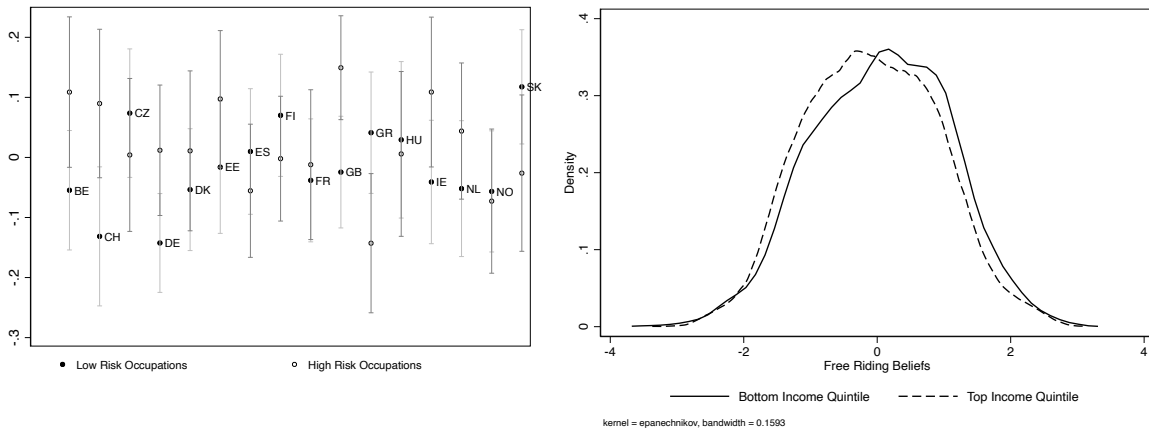
Table 1: Socioeconomic Variables (ESS Analysis)

	ESS variable	Comments
Income	The ESS provides a categorical income variable designed to match the income distribution of the surveyed country: e.g. individuals who are in category 1 are individuals who declare a household income below the country's first decile.	This income measure is designed to be comparable across countries. As a robustness check, I examined whether the thresholds used by the ESS align with those recovered using the Luxembourg Income Study's datasets. For some countries, I found evidence of a mismatch between the two. As a result, I examine whether the results are robust to using a trichotomous recoding of the 1-to-10 income variable that relies on LIS-derived estimates of key income cutoffs. First, I use the LIS to compute country-specific values of the 20th and 80th percentiles of the household income distribution. I then recode the income value to identify respondents who, according to these measures, belong to the top and bottom quintiles.
Unemployment risk	The ESS provides data on individuals' occupation, using the ISCO88 classification at the 3 digit level	I use the occupation variable to match respondent to a measure of occupational unemployment rate. To compute the latter, I use the European Labour Force Survey. I measure the share of individuals in a given occupation who are unemployed at the time of the survey. I pooled three years of labour force surveys to decrease measurement error. Occupations that have too few observations are dropped. In a robustness check, I also ran the same analysis using the number of individuals who are unemployed as well as individuals who are in involuntary part-time or in a fixed-term contracts as the numerator.
Education	The ESS provides the following categorical variable: Less than lower secondary education/Lower secondary education completed / Upper secondary education completed /Post-secondary non-tertiary education / Tertiary education completed	I identify respondents who have a post-secondary education as having a "tertiary degree."
Years of schooling	Years of full-time education completed	I standardize this measure using country-specific mean and SD. I use this measure in conjunction with the "tertiary degree" variable to control for years of education and degree.
Labor market status	The ESS asks respondents about their main activity in the past 7 days	I distinguish between the employed, the unemployed and those out of the labor market. Within the employed, I single out individuals in a more precarious situation, i.e., individuals who have experienced unemployment in the past year and are working part time or on a fixed-term contract.

A.2. Free Riding Beliefs and its Correlates

Figure 1 uses measures of occupational unemployment to distinguish individuals working in jobs where unemployment is high (top quintile of the unemployment risk, measure) from individuals working in jobs where unemployment is low (bottom quintile). Information on the unemployment risk measure is provided in Table 1. As the figures show, respondents working in occupations exposed to high unemployment or living in the bottom quintile households are not more likely to express pessimistic free riding.

Figure 1: Free Riding Beliefs, Unemployment Risk and Income



Left panel: plots the average free riding beliefs score among the top (high risk) and bottom (low risk) unemployment risk quintiles. Higher values mean more pessimistic/right-wing free riding beliefs. *Right panel:* plots the distribution of free riding beliefs score among the top and bottom income quintiles. See Table 1 for more information on the unemployment risk and income measures. Working age population only.
Source: ESS wave 4

Table A.2, column (1) uses education and labor market status as additional predictors. To focus on the population at large, I drop the unemployment risk variable, which only exists for people in the labor force. The unemployed have more optimistic/left-wing free riding beliefs: relative to a working insider, their free riding belief score is 0.29 SD lower. This is the only coefficient that suggests free riding beliefs are shaped by reliance on social transfers. Being less educated, in contrast, is associated with more pessimistic/right-wing free riding beliefs. Column (2) documents the correlation between free riding beliefs and liberal-authoritarian values (LAVs). LAVs were measured using weights recovered from an exploratory factor analysis ran on the pooled data. The items used are worded as follow:

1. Schools should teach children to obey authority
2. People who break the law should receive much harsher sentences
3. Terrorist suspect in prison until police satisfied
4. Men should have more right to job than women when jobs are scarce
5. Gays and lesbians free to live life as they wish
6. Women should be prepared to cut down on paid work for sake of family

Table 2: Predicting Differences in Free Riding Beliefs

	(1)	(2)
	b/se	b/se
Income (10 deciles)	-0.01 (0.00)	0.00 (0.00)
Unemployed [ref: employed]	-0.22*** (0.05)	-0.26*** (0.05)
Outsider [ref: insider]	-0.07** (0.02)	-0.06* (0.03)
Years of education †	-0.10*** (0.01)	-0.04** (0.01)
College degree	-0.21*** (0.03)	-0.08** (0.03)
Man [ref: woman]	-0.03* (0.01)	0.01 (0.01)
Age	0.00*** (0.00)	-0.00 (0.00)
Liberal Authoritarian Values † (LAVs)		0.56*** (0.05)
Constant	0.01 (0.06)	0.02 (0.05)
N	27864	26555

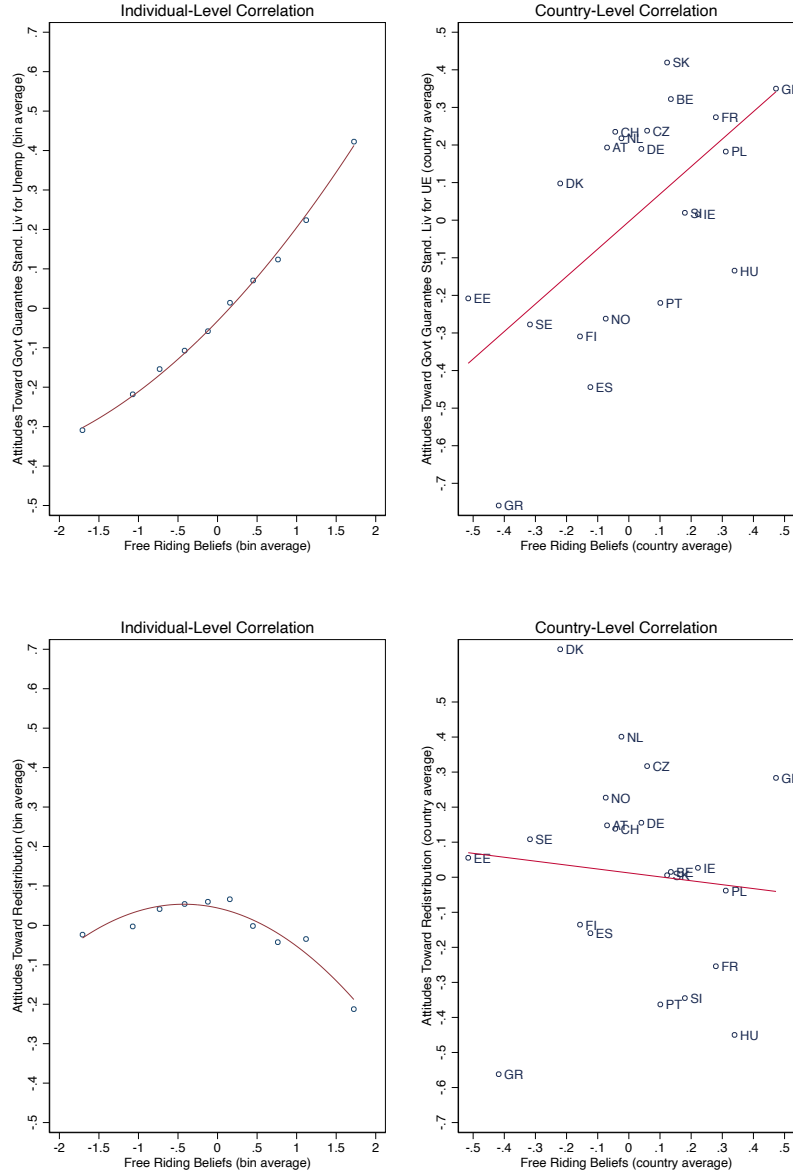
Results from multilevel linear regressions. Outcome variable is standardized using country-specific mean and SD. Higher values mean more pessimistic/right-wing free riding beliefs. Variables marked with † have been de-meant and divided by 2 SDs. Coefficients on these variables can be interpreted as a β standard deviation change in free riding beliefs following a 2 SD change in the predictor.

Source: ESS round 4, weighted

A.3. Beyond Tax/Spend Attitudes

Figure 2 plots individuals and country-level correlations between free riding beliefs and two survey items commonly used in research on social policy preferences. One is an item asking about the government’s role in financially supporting the unemployed. The other asks about income redistribution. In line with previous findings by Cavaille and Trump (2015), the latter item does not correlate with free riding beliefs (bottom panel). In contrast, there is a strong correlation between perceptions of free riding among people who cannot provide for themselves and support for government income support (top panel).

Figure 2: Social Policy Preferences and Free Riding Beliefs



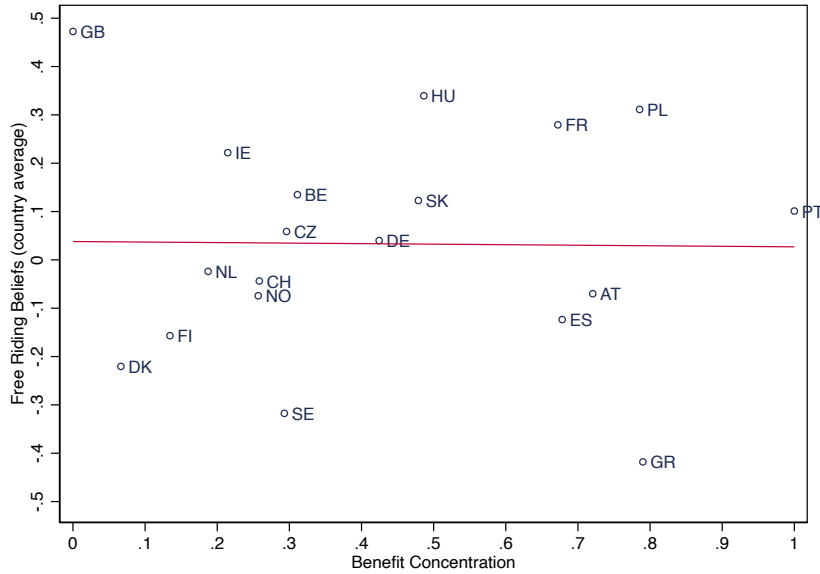
X-axis: Average free riding beliefs. The higher a respondent's score, the more likely she is to be concerned about free riding. Y-axis, top panel: "How much responsibility do you think the governments should have to ensure a reasonable standard of living for the unemployed?" Average answer on a 0 (Should not be governments' responsibility at all) to 10 (Should be entirely government's responsibility) response scale. **The scale is reversed** so that higher values indicate more disagreement. Y-axis, bottom panel: "The government should take measures to reduce differences in income levels" Average answer on a 1 (Agree strongly) to 5 (Disagree strongly) response scale. Left panel: scores are standardized using **country-specific** mean and SD. Right panel: scores are standardized using the mean and SD from the **pooled** data.
 Source: ESS wave 4, weighted

A.4. Benefit Concentration

Figure 3 demonstrates that countries with more targeted benefits are not countries with more pessimistic free riding beliefs. Table 3 examines how the correlation between free riding beliefs and tax/spend attitudes varies with benefit concentration. Results using the full sample (column (1)) suggest that the size of the correlation decreases as benefit concentration decreases. As column (3)

shows this relationship is limited to individuals in the top income quintile. When benefit concentration decreases, even this group stands to loose from spending cuts. As a result, as benefit concentration decreases, this group decreases its reliance on fairness reasoning. As the coefficient on benefit concentration shows, within this group, moving from high (0) to low (1) concentration decreases opposition to cuts by 0.26 SD. This decrease is larger for people with the most pessimistic free riding beliefs, i.e., with a free riding score 1 SD above the country mean ($-0.26 + 0.5 * -0.39 = -0.45$).

Figure 3: Correlation Between Free Riding Beliefs and Benefit Concentration



X-axis, top panel: Normalized benefit concentration scores, from high (0) to low (1). Y-axis: Average free riding beliefs. The higher a respondent's the score, the less likely she is to be concerned about free riding. The scores are standardized using the mean and SD from the pooled data.

Source: ESS wave 4, weighted

Table 3: Predicting Tax/Spend Attitudes: Additional Analyses

Sample used depending on income category	(1)	(2)	(3)
	Full Sample	Bottom quintile	Top quintile
Income [1 to 10]	0.01* (0.01)		
Free riding beliefs	0.54*** (0.04)	0.35*** (0.07)	0.76*** (0.08)
Benef. concentration High (0) to low (1)	0.05* (0.02)	0.19 (0.10)	-0.26** (0.08)
Free riding beliefs * Benef. Con.	-0.24 (0.13)	0.16 (0.16)	-0.39* (0.18)
N	27812	5403	4393

Results from multilevel linear regressions. Outcome variable is standardized using **country-specific** mean and SD. Free riding belief scores are demeaned and divided by 2 standard deviations using **country-specific** mean and SD. Coefficients can consequently be interpreted as a β SD(s) change in support for cuts following a 2 SDs change in free riding beliefs. Income variable ranges from 1 (1st decile) to 10 (10th decile). Benefit concentration variable is normalized: coefficient can be interpreted as a β_{BC} standard deviation(s) change in tax/spend attitudes following a change from the highest to the lowest benefit concentration value. See Table 1 for detail on the top and bottom quintiles income measures.

Source: ESS wave 4.

Probing the OECD measure The OECD uses country-specific income surveys provided by member states to compute the measures used in the analysis in section 2. These surveys cover the

2004-2008 period. To test the robustness of this measure, I used the Luxembourg Income Study (LIS 2015), which harmonizes income and labour force surveys to make them comparable across countries, to compute measures of benefit concentration, using a formula identical in spirit to the Gini coefficient (see code below). Because LIS does not provide enough information on the nature and origin of transfers, I rely on a second best solution, which is to examine the distribution of cash transfers in the working-age population (18-62 years old). This allows me to compute a measure that does not take into account pension and old-age related transfers. However, when compared to the OECD measure, the reference population is different, providing only an imperfect point of comparison. I find a strong correlation between the OECD working-age cash transfer and the LIS measure (0.76 with a sample size of 20). The main problematic case is Switzerland: the concentration levels are much higher in the LIS data than in the OECD data. However, a recent 2011 version of this measure released by the OECD confirms the country ranking in the 2008 measure (OECD 2014).

I also examined whether measures of benefit concentration are related, as assumed, to the distribution of unemployment risk in the population, as well as to policy design. To measure risk concentration, I use a measurement strategy similar to the one in Rehm, Hacker and Schlesinger (2012) (see the article for more details). Unfortunately, the size of my sample drops from 20 to 11, in this small sample, the correlation between benefit concentration and risk concentration is 0.66. As a result, I prefer to use average unemployment rates over the previous five years as a proxy for risk concentration. The assumption is that countries with higher resilient unemployment rates are most likely to be countries where unemployment risks expand beyond the low skilled poor workers (i.e. higher average unemployment rate indicates lower risk concentration). As a proxy for policy design, I use average income replacement rates for unemployment insurance. I use an updated version of Ferrarini et al. (2013) that was kindly provided to me by the authors. Unemployment rate and replacement rates predict the working-age benefit measure well: the explained variance is close to 0.7 and the standardized coefficients on each measure are substantive (ranging from 0.4 to 0.7 depending on specifications).

Code submitted to LIS platform (data is only accessible remotely):

```
program define welfdimP
drop if age > 62
drop if age < 18
drop if dhi == .
drop if hwgt == .
replace hwgt = 0.01 if hwgt == 0
gen pwt = hwgt * nhmem

gen transfer = hit - hitp
replace transfer = hit if transfer == .
drop if transfer == .
replace transfer = 0 if transfer < 0
replace transfer = transfer / (sqrt(nhmem))

* pre transfer income
gen pretrinc = dhi - transfer
replace pretrinc = pretrinc / (sqrt(nhmem))
```

```
replace pretrinc=0 if pretrinc<0
```

```
*concentration coefficient generated here  
sgini transfer [aweight=pwt], sortvar(pretrinc)
```

```
end
```

```
foreach ccy in at04 be00 cz04 dk04 ee04 fi04 fr05 de04 gr04 hu05 ie04 nl04 no04 pl04 sk07 es04 se05  
ch04 uk04
```

```
di "'ccy'"
```

```
use age dhi hwgt nhmem hit hitp hits hitsu hitsa using '$ccy'h, clear  
welfdimP
```


A.5. Additional Results With Controls

Table 4: Predicting Tax/Spend Attitudes: Adding SES Controls

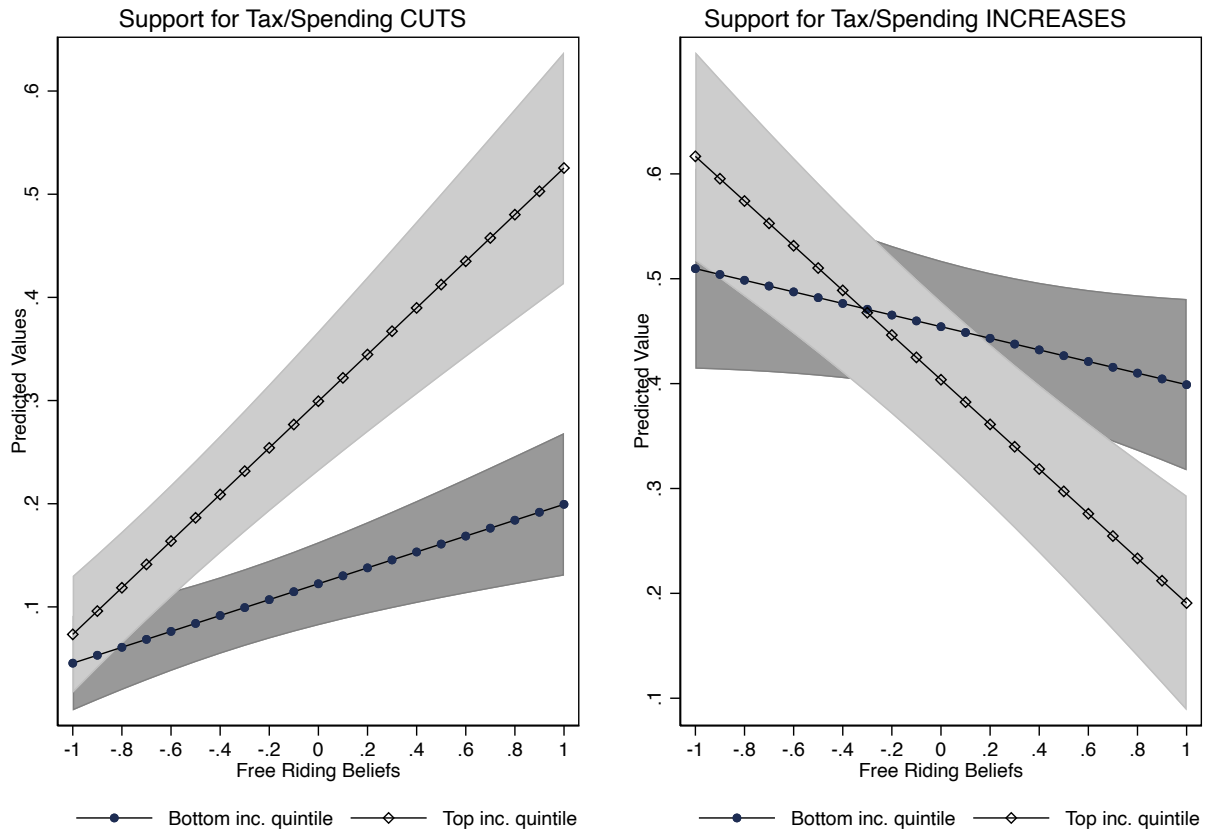
	(1)	(2)
	b/se	b/se
Income (10 deciles)	0.01 (0.01)	0.01 (0.01)
Free riding Beliefs †	0.43*** (0.04)	0.26*** (0.05)
Free riding Beliefs * Income		0.03** (0.01)
Unemployed [ref: employed]	0.02 (0.03)	0.01 (0.03)
Outsider [ref: insider]	-0.00 (0.03)	-0.01 (0.03)
Years of education †	-0.01 (0.01)	-0.01 (0.01)
College degree	-0.02 (0.02)	-0.01 (0.02)
Man [ref: woman]	-0.01 (0.02)	-0.01 (0.02)
Age	-0.01*** (0.00)	-0.00*** (0.00)
_cons	0.17** (0.06)	0.17** (0.06)
Random-effects parameters		
sd(income)	0.02*** (0.00)	0.02*** (0.00)
sd(free riding)	0.16*** (0.03)	0.16*** (0.03)
sd(years schooling)	0.04*** (0.01)	0.04*** (0.01)
sd(age)	0.00*** (0.00)	0.00*** (0.00)
N	27534	27534

Results from multilevel linear regressions. Outcome variable is standardized using **country-specific** mean and SD. Higher values mean more pessimistic/right-wing free riding beliefs. Variables marked with † have been de-meant and divided by 2 SDs. Coefficients on these variables can be interpreted as a β standard deviation change in free riding beliefs following a 2 SD change in the predictor.

Source: ESS round 4, weighted

A.6. Explaining Tax/Spend Attitudes in Denmark

Figure 4: Explaining Tax/Spend Attitudes in Denmark



Left panel: plots predicted share of respondents, alongside 95% confidence intervals, choosing cuts over increases (i.e., a response category inferior to 5 on the 0/10 scale). *Right panel:* plots predicted share of respondents choosing increases over cuts (i.e., a response category superior to 5 on the 0/10 scale).

Outcomes were regressed on free riding beliefs and interacted with income dummies (top quintile, bottom quintile, the rest). Predicted values are generated using free riding scores running from 1 SD below to 1 SD above the mean.

Source: ESS round 4, weighted

A.7. Robustness Checks

Let's assume my results are an artifact of low-income individuals being less likely (relative to high-income individuals) to provide internally consistent survey answers. If true then I would expect the latter to manifest itself in patterns of answers to the free riding items: low-income individuals should be more likely to give conflicting answers on these items, suggesting less well-formed beliefs, which in turn, have more limited effects on policy attitudes. To examine this possibility, Table 5 replicates the factor analysis presented in the main paper in Table 1 separately for low income (bottom quintile) and high income (top quintile respondents, see Table 1 for more detail on the income measure). Of interest here are the Eigenvalues which provide summary measures of the correlation matrices underpinning the analyses. The eigenvalues are similar across the two samples, as are the factor loadings. This indicates that the inter-item correlation matrices are very similar across the two groups, which is inconsistent with low-income respondents having less well formed beliefs and preferences on the issues of free riding and social preferences. This results hold in a country-by-country analysis (not shown). In Table 6, I list two additional robustness checks not mentioned in the main manuscript.

Table 5: Free Riding Beliefs by Income Levels

Item wording	Bot- tom Quin- tile	Top Quin- tile
Beliefs about the prevalence of shirking		
Most unemployed people do not really try to find a job	0.54	0.57
Many manage to obtain benefits/services not entitled to	0.43	0.56
Employees often pretend they are sick to stay at home	0.52	0.50
Beliefs about the disincentive effects of social benefits		
Social benefits/services make people lazy	0.73	0.79
Social benefits/services make people less willing to care for one another	0.77	0.77
Social benefits/services make people less willing look after themselves/family	0.76	0.81
Eigenvalue	2.48	2.04

Exploratory factor analysis on a subset of the data using a polychoric correlation matrix adapted to ordinal variables. Extracted method: iterated principal factor method, robust to using other extraction methods. Analysis includes all countries available in wave 4. *Source:* ESS wave 4

Table 6: Additional Robustness Checks

	Concern	Check	Result
1	Higher country-level unemployment rates predict both low reliance and low income gradient.	Re-ran multi-level analysis controlling for unemployment rates averaged over the 2003-2008 period, as well as the 2008 unemployment rate.	Results hold.
2	Because of large confidence intervals my results run the risk of being mainly driven by the contrast between Great Britain and Denmark on the one hand and Greece on the other (see Figure ??).	I re-ran the multi-level analysis taking each country out in turn.	Results hold.

B. Changes in Welfare Attitudes: BSAS Analysis

B.1. Free Riding Beliefs in Great Britain and Their Correlates

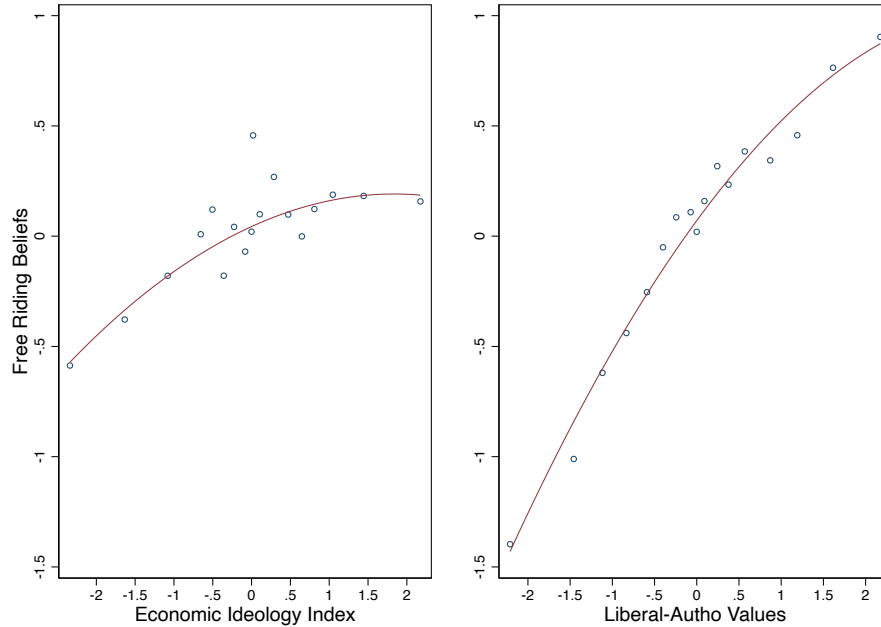
To measure free riding beliefs, I combine answers to the 8 survey items listed in Table 7 (left column). These items ask about the perceived work ethic of the unemployed (whether due to “laziness” or moral hazard), beliefs about the prevalence of shirking and the perceived deservingness of welfare recipients. Both an exploratory and confirmatory factor analysis show that all items load on the same latent variable. I consequently combine these items into a free riding belief score using weights recovered from the exploratory factor analysis. Items are coded so that a higher score indicates more pessimistic/right-wing free riding beliefs.

Table 7: Free Riding Items

<p><i>Free Riding Beliefs</i></p> <p>Benefits for unemployed people: too low and cause hardship vs. too high and discourage job seeking The welfare state encourages people to stop helping each other If welfare benefits weren't so generous, people would learn to stand on their own two feet Many people who get welfare don't really deserve any help Most unemployed people could find a job if they really wanted one Most people on the dole are fiddling</p>	<p><i>Economic/Redistributive Ideology</i></p> <p>Management will always try to get the better of employees if it gets the chance There is one law for rich and one for poor Working people do not get their fair share of nation's wealth Big business benefits owners at the expense of workers It is the responsibility of the government to reduce the differences in income Government should redistribute income from the better-off to those who are least well-off</p>
<p><i>Liberal-Authoritarian Values (LAVs)</i></p> <p>People who break the law should be given stiffer sentences For some crimes, the death penalty is the most appropriate sentence Young people today do not have enough respect for traditional British values Schools should teach children to obey authority</p>	

The items in the right column capture traditional economic/redistributive ideology. The items at the bottom of the table are used to compute Liberal-Authoritarian Values (LAVs) scores. I combine answers to these items using a similar procedure as the one used for free riding beliefs. Note that results are substantively the same if I combine items into separate additive indices. Figure 5 uses binned scatter plots to visually represents the correlation between free riding beliefs, economic ideology and LAVs. Against common expectations, free riding beliefs are only poorly correlated with survey items traditionally used to measure economic/redistributive ideology: only the most left-wing respondent (1 SD below the mean) express free riding beliefs that align with their economic/redistributive ideology. Instead, as mentioned in the main manuscript, free riding beliefs better correlate with survey items used to measure differences in non-economic/cultural ideology, specifically differences in LAVs.

Figure 5: Free Riding Beliefs and Its Ideological Correlates: Great Britain (2016)



Binned scatter plots, The variable on the X-axis is split into 20 bins. The line represents a quadratic fit computed using the full underlying data. Scores have been standardized. Higher values are associated with right-wing beliefs and attitudes (i.e., high prevalence of free riding, authoritarian values, right-wing on economic issues).

Source: British Social Attitude Survey, 2016

B.2. Measuring Income in the BSAS

BSAS respondents were asked to provide an assessment of household income from all sources by choosing among a list of income brackets. New top income brackets were regularly added through the years. First, I transform the income intervals into their common-currency mid points (ex: [2000–3000] becomes 2500). Second, for the top category, I use the method recommended by Hout (2004), which imputes an income value that is a function of the number of respondents in the top category and the number of respondents in the bracket that precedes it. This information, combined with a few assumptions regarding the skew of the income distribution, seeks to compensate for under-estimating income levels among those with the highest income in the sample. Finally, I multiply the estimate by the GDP deflator available on the Bank of England website and adjust for household size by dividing by the square root of the number of people living in the household. I then divide this income measure into year-specific quintiles. Income trends in the BSAS are similar to those found in Labour Force Surveys: in the BSAS, the gap between the mean bottom quintile household income and the mean top quintile household income has increased from a multiple of 9 in 1986 to a multiple of 15 in 2009.

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