**"Don’t play it if you can’t win“ - does economic inequality undermine political equality?**

**Armin Schäfer and Hanna Schwander, European Political Science Review**

Supplementary file

Appendix 1: Regression models with the Theil index

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DV: Voter turnout | RE | RE with year fixed effects | PCSE | PCSE with LDV | Bootstrap | DRIS | MLM |
| Theil index (EHII) | -0.49\* (0.23) | -1.20\*\*\* (0.25) | -1.06\*\*\* (0.16) | -0.26\* (0.12) | -1.22\*\*\* (0.19) | -1.22\*\*\* (0.09) | -0.53\* (0.21) |
| Compulsory voting (Reference: None) |  |  |  |  |  |  |  |
| *Without sanctions* | 8.01+ (4.63) | 11.44\*\*\* (2.14) | 10.25\*\*\* (1.81) | 3.32\*\* (1.22) | 11.13\*\*\* (1.48) | 11.13\*\*\* (0.94) | 8.20\* (4.08) |
| *With sanctions* | 13.68\* (5.38) | 13.44\*\*\* (2.53) | 13.62\*\*\* (1.72) | 4.79\* (1.86) | 14.02\*\*\* (2.31) | 14.02\*\*\* (1.57) | 13.52\*\* (4.75) |
| Presidentialism | -8.23\* (3.90) | -9.76\*\*\* (1.73) | -9.98\*\*\* (1.41) | -2.63+ (1.56) | -9.68\*\*\* (1.50) | -9.68\*\*\* (1.42) | -8.31\* (3.43) |
| Index of bicameralism | 0.85 (2.47) | 0.23 (1.07) | 0.51 (0.83) | 0.03 (0.66) | 0.13 (1.03) | 0.13 (0.57) | 0.88 (2.18) |
| Gallagher index of disproportionality | -0.13 (0.11) | -0.32\*\* (0.11) | -0.26\* (0.11) | -0.10 (0.10) | -0.30\*\* (0.11) | -0.30\* (0.11) | -0.14 (0.11) |
| Effective no. of parties | -0.30 (0.51) | 0.21 (0.41) | 0.09 (0.22) | -0.16 (0.16) | 0.12 (0.33) | 0.12 (0.23) | -0.24 (0.47) |
| Distance 1st and 2nd party (log.) | -0.70 (0.43) | -1.86\*\* (0.65) | -1.30\*\* (0.49) | -0.84+ (0.43) | -1.99\*\* (0.60) | -1.99\*\*\* (0.17) | -0.73+ (0.41) |
| Population (log.) | -1.59 (2.03) | -0.58 (0.89) | -0.99 (0.68) | -0.18 (0.57) | -0.49 (0.91) | -0.49 (0.46) | -1.58 (1.79) |
| GDP per capita (log.) | -5.91\* (2.51) | 0.25 (2.73) | -1.14 (2.38) | 1.96+ (1.18) | -0.54 (2.57) | -0.54 (1.39) | -5.61\* (2.39) |
| Decade (Reference: 1980s) |  |  |  |  |  |  |  |
| *1990s* | -1.02 (1.15) |  | -1.27 (0.88) | -0.89 (0.83) | -2.02 (1.37) | -2.02\* (0.76) | -1.09 (1.11) |
| *2000-present* | -2.78 (1.82) |  | -4.06\*\* (1.46) | -1.60 (1.19) | -4.95\* (2.25) | -4.95\*\*\* (0.61) | -2.90+ (1.74) |
| Lagged dependent variable |  |  |  | 0.74\*\*\* (0.09) |  |  |  |
| Year fixed effects |  | Yes |  |  |  |  |  |
| Constant | 171.67\*\*\* (30.04) | 129.04\*\*\* (31.62) | 140.26\*\*\* (23.68) | 13.73 (21.83) | 137.70\*\*\* (29.62) | 137.70\*\*\* (14.89) | 169.93\*\*\* (28.35) |
| R² | 0.66 | 0.77 | 0.91 | 0.88 | 0.75 | 0.75 |  |
| N (elections) | 147 | 147 | 147 | 125 | 147 | 147 | 147 |
| N (countries) | 21 | 21 | 21 | 21 | 21 | 21 | 21 |

Standard errors in parentheses; + p<0.1 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001

Note: This table includes the coefficients of six regression models that use the Theil index as the measure of income inequality which uses the distribution of resources between (geographical) units to calculate inequality. The columns include the following models:

RE Random Effects model

RE\_yfe Random Effects model with year fixed effects

PCSE Panel Corrected Standard Errors

PCSE\_LDV Panel Corrected Standard Errors with the Lagged Dependent Variable

Bootstrap Reiterated OLS Regression that resample observations 200 times

DRIS Driscoll and Kraay standard errors that account for heteroscedastic and auto-correlated data

MLM Linear Multilevel Regression Model that assumes that observations are nested within countries

Appendix 2: Regression models with the Gini coefficient

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DV: Voter turnout | RE | RE year fixed effects | PCSE | PCSE with LDV | Bootstrap | DRIS | MLM |
| Gini (SWIID) | -0.395\* (0.155) | -0.545\*\*\* (0.157) | -0.472\*\* (0.164) | -0.168+ (0.099) | -0.636\*\*\* (0.161) | -0.636\*\*\* (0.077) | -0.317\* (0.152) |
| Compulsory voting (Reference: None) |  |  |  |  |  |  |  |
| *Without sanctions* | 8.138\* (3.716) | 8.267\*\*\* (1.960) | 8.105\*\*\* (1.474) | 1.923+ (0.998) | 8.800\*\*\* (1.965) | 8.800\*\*\* (0.905) | 7.770+ (4.419) |
| *With sanctions* | 13.278\*\* (4.244) | 12.933\*\*\* (2.340) | 12.560\*\*\* (2.411) | 3.371\* (1.388) | 12.406\*\*\* (2.471) | 12.406\*\*\* (1.879) | 13.768\*\* (4.983) |
| Presidentialism | -8.594\*\* (3.169) | -11.669\*\*\*  (1.817) | -9.052\*\*\* (1.561) | -2.329\* (1.009) | -10.534\*\*\* (1.477) | -10.534\*\*\* (1.270) | -8.425\* (3.759) |
| Index of bicameralism | 1.732 (1.950) | 0.006  (1.049) | 2.089+ (1.163) | 0.078 (0.661) | 0.510 (1.117) | 0.510 (0.525) | 1.639 (2.258) |
| Effective no. of parties | -0.664 (0.441) | -0.260 (0.445) | -0.406 (0.309) | -0.274 (0.212) | -0.443 (0.397) | -0.443\*\* (0.109) | -0.758+ (0.434) |
| Gallagher index of disproportionality | -0.074 (0.106) | -0.327\*\* (0.108) | -0.247\* (0.105) | -0.026 (0.052) | -0.270\* (0.115) | -0.270\* (0.120) | -0.033 (0.103) |
| Distance 1st and 2nd party (log.) | -0.824+ (0.421) | -2.348\*\*\*  (0.650) | -0.653 (0.445) | -0.752\* (0.336) | -1.966\*\*\* (0.561) | -1.966\*\*\* (0.428) | -0.729+ (0.393) |
| Population (log.) | -2.340 (1.621) | -1.042 (0.907) | -2.574\* (1.113) | -0.251 (0.613) | -1.285 (0.927) | -1.285\*\* (0.396) | -2.395 (1.866) |
| GDP per capita (log.) | -3.459 (2.450) | 4.633+ (2.562) | -2.447 (2.210) | 1.689 (1.070) | 3.805 (2.763) | 3.805\* (1.499) | -4.140+ (2.377) |
| Decade (Reference: 1980s) |  |  |  |  |  |  |  |
| *1990s* | -1.451 (1.089) |  | -0.740 (0.769) | -0.757 (0.713) | -2.852\* (1.418) | -2.852\*\*\* (0.606) | -1.363 (1.026) |
| *2000-present* | -3.910\* (1.665) |  | -3.689\*\* (1.336) | -1.555 (1.101) | -8.471\*\*\* (2.046) | -8.471\*\*\* (0.494) | -3.600\* (1.593) |
| Lagged dependent variable |  |  |  | 0.797\*\*\* (0.070) |  |  |  |
| Year fixed effects |  | Yes |  |  |  |  |  |
| Constant | 147.847\*\*\* (27.636) | 68.637\*  (27.906) | 141.252\*\*\* (22.947) | 8.133 (15.830) | 78.782\*\* (28.785) | 78.782\*\*\* (13.574) | 153.035\*\*\* (27.421) |
| R² | 0.65 | 0.77 | 0.93 | 0.90 | 0.71 | 0.71 |  |
| N (elections) | 171 | 171 | 171 | 157 | 171 | 171 | 171 |
| N (countries) | 21 | 21 | 21 | 21 | 21 | 21 | 21 |

Standard errors in parentheses; + p<0.1 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001.

Note: This table includes the coefficients of various regression models that use the Gini coefficient (Solt 2016) as the measure of income inequality. The columns include the following models:

RE Random Effects model

RE\_yfe Random Effects model with year fixed effects

PCSE Panel Corrected Standard Errors

PCSE\_LDV Panel Corrected Standard Errors with the Lagged Dependent Variable

Bootstrap Reiterated OLS Regression that resample observations 200 times

DRIS Driscoll and Kraay standard errors that account for heteroscedastic and auto-correlated data

MLM Linear Multilevel Regression Model that assumes that observations are nested within countries

*Appendix 3: Regression models for Germany*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | PCSE | PCSE\_LDV | Boot | RE | MLM | DRIS |
| Inequality | -18.698\*\*\* | -9.862\*\* | -16.751\*\*\* | -30.440\*\*\* | -31.964\*\*\* | -16.751\*\*\* |
|  | (4.64) | (4.97) | (1.19) | (1.16) | (1.19) | (1.93) |
| Average state income (log) | -25.417\*\* | 2.676 | -26.825\*\*\* | -27.117\*\*\* | -29.522\*\*\* | -26.825\*\*\* |
|  | (10.80) | (11.96) | (0.77) | (0.67) | (0.54) | (6.64) |
| Distance 1st and 2nd party | 0.163 | 0.281 | 0.311\*\*\* | 0.167\*\* | 0.136\*\* | 0.311\*\*\* |
| (log.) | (0.35) | (0.35) | (0.07) | (0.08) | (0.07) | (0.11) |
| East–West dummy | -7.132\*\*\* | 0.101 | -7.781\*\*\* |  | -5.869\*\*\* | -7.781\*\*\* |
|  | (2.37) | (2.32) | (0.31) |  | (0.38) | (1.90) |
| Population (log.) | 1.051\*\*\* | 0.511 | 1.082\*\*\* | 1.078\*\*\* | 1.059\*\*\* | 1.082\*\*\* |
|  | (0.31) | (0.35) | (0.13) | (0.25) | (0.22) | (0.07) |
| L.Average turnout |  | 0.560\*\*\* |  |  |  |  |
|  |  | (0.19) |  |  |  |  |
| Constant | 327.630\*\*\* | 6.188 | 338.994\*\*\* | 351.234\*\*\* | 377.561\*\*\* | 338.994\*\*\* |
|  | (108.71) | (126.19) | (8.21) | (7.78) | (6.65) | (65.03) |
| R2 | 0.884 | 0.567 | 0.488 | 0.312 |  | 0.488 |
| N | 2369 | 1984 | 2369 | 2369 | 2369 | 2369 |

Standard errors in parentheses; + p<0.1 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001.

Note: The columns include the following models:

RE Random Effects model

PCSE Panel Corrected Standard Errors

PCSE\_LDV Panel Corrected Standard Errors with the Lagged Dependent Variable

Bootstrap Reiterated OLS Regression that resample observations 200 times

DRIS Driscoll and Kraay standard errors that account for heteroscedastic and auto-correlated data

MLM Linear Multilevel Regression Model that assumes that observations are nested within countries

*Appendix 4: Regression models for Germany over time*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1998 | 2002 | 2005 | 2009 | 2013 | 2017 |
| Inequality | -4.587\*\*\* | -8.668\*\*\* | -9.511\*\*\* | -14.404\*\*\* | -15.478\*\*\* | -13.567\*\*\* |
|  | (1.54) | (1.34) | (1.34) | (1.78) | (1.66) | (1.49) |
| State average income (log.) | -35.442\*\*\* | -0.793 | -13.200\*\*\* | -17.673\*\*\* | -23.202\*\*\* | 5.796 |
|  | (3.26) | (2.91) | (3.00) | (4.15) | (4.14) | (3.82) |
| Distance 1st and 2nd party | -0.848\*\*\* | 0.493\*\*\* | 0.096 | 0.182 | -0.000 | 0.221 |
| (log.) | (0.14) | (0.14) | (0.12) | (0.17) | (0.19) | (0.17) |
| East–West dummy | -11.407\*\*\* | -6.225\*\*\* | -4.931\*\*\* | -8.215\*\*\* | -6.447\*\*\* | -0.445 |
|  | (0.80) | (0.67) | (0.69) | (0.76) | (0.89) | (0.79) |
| Population (log.) | 1.636\*\*\* | 0.811\*\*\* | 1.136\*\*\* | 1.288\*\*\* | 1.806\*\*\* | 1.013\*\*\* |
|  | (0.23) | (0.21) | (0.21) | (0.25) | (0.25) | (0.23) |
| Constant | 411.231\*\*\* | 82.710\*\*\* | 199.626\*\*\* | 240.763\*\*\* | 291.527\*\*\* | 14.613 |
|  | (32.33) | (28.97) | (30.22) | (41.97) | (42.15) | (39.05) |
| R2 | 0.465 | 0.608 | 0.373 | 0.531 | 0.462 | 0.437 |
| N | 385 | 394 | 394 | 394 | 401 | 401 |

Standard errors in parentheses; + p<0.1 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001.

Note: Models are based on ordinal linear regressions

*Appendix 5: Inequality and individual voter turnout*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DV: Voted last general election | Model 1 | Model 2 | Model 3  (turnout weighted) | Model 4  (countries weighted equally) | Model 5 | Model 6 |
| Gender  (female=1) | 0.01 (0.03) | -0.01 (0.03) | -0.02 (0.03) | -0.00 (0.03) | -0.00 (0.03) | -0.00 (0.03) |
| Age | 0.10\*\*\* (0.01) | 0.10\*\*\* (0.01) | 0.10\*\*\* (0.01) | 0.11\*\*\* (0.01) | 0.10\*\*\* (0.01) | 0.10\*\*\* (0.01) |
| Age\*Age | -0.00\*\*\* (0.00) | -0.00\*\*\* (0.00) | -0.00\*\*\* (0.00) | -0.00\*\*\* (0.00) | -0.00\*\*\* (0.00) | -0.00\*\*\* (0.00) |
| Union member  (0=no; 1=yes) | 0.32\*\*\* (0.04) | 0.36\*\*\* (0.04) | 0.32\*\*\* (0.06) | 0.37\*\*\* (0.05) | 0.37\*\*\* (0.04) | 0.36\*\*\* (0.04) |
| Married  (0=no; 1=yes) | 0.34\*\*\* (0.04) | 0.32\*\*\* (0.04) | 0.33\*\*\* (0.04) | 0.31\*\*\* (0.04) | 0.31\*\*\* (0.04) | 0.31\*\*\* (0.04) |
| Unemployed  (0=no; 1=yes) | 0.15\*\*\* (0.01) | 0.16\*\*\* (0.02) | 0.13\*\*\* (0.02) | 0.16\*\*\* (0.02) | 0.15\*\*\* (0.02) | 0.16\*\*\* (0.02) |
| Household Income | 0.15\*\*\* (0.01) | 0.16\*\*\* (0.02) | 0.13\*\*\* (0.02) | 0.16\*\*\* (0.02) | 0.15\*\*\* (0.02) | 0.16\*\*\* (0.02) |
| Gini (SWIID) | -0.05\*\*\* (0.01) | -0.05\*\*\* (0.01) | -0.04\*\*\* (0.01) | -0.04\*\* (0.01) | -0.06\*\*\* (0.02) | -0.06\*\*\* (0.02) |
| Income\*Gini (SWIID) |  |  |  |  | 0.01\* (0.00) | 0.01\* (0.00) |
| Decade  (Reference: 1980s) | -0.01 (0.01) | -0.00 (0.01) | -0.04\*\*\* (0.01) | -0.00 (0.01) | -0.00 (0.01) |  |
| *1990s* | -0.41 (0.36) | -0.20 (0.21) | 0.02 (0.23) | -0.23 (0.25) |  | -0.20 (0.21) |
| *2000s* | -0.48+ (0.26) | -0.31 (0.20) | -0.55\*\* (0.20) | -0.37 (0.23) |  | -0.31 (0.20) |
| *2010s* | -0.32 (0.31) | -0.20 (0.22) | -0.60\*\* (0.22) | -0.19 (0.25) |  | -0.20 (0.22) |
| Year fixed effects |  |  |  |  | Yes |  |
| Compulsory voting (Reference: None) |  |  |  |  |  |  |
| *Without sanctions* |  | 1.09\*\*\* (0.16) | 0.99\*\*\* (0.16) | 1.00\*\*\* (0.17) | 1.11\*\*\* (0.16) | 1.09\*\*\* (0.16) |
| *With sanctions* |  | 1.15\*\*\* (0.30) | 1.47\*\*\* (0.27) | 0.42 (0.34) | 1.01\*\*\* (0.30) | 1.15\*\*\* (0.30) |
| Presidentialism  (0=no; 1=yes) | 0.43 (0.30) | 0.46+ (0.27) | 0.17 (0.32) | 0.49 (0.32) | 0.42 (0.30) | 0.43 (0.30) |
| Bicameralism  (0=no; 1=yes) | 0.26\*\* (0.10) | 0.27\* (0.14) | 0.18+ (0.10) | 0.30\*\*\* (0.09) | 0.27\*\* (0.10) | 0.26\*\* (0.10) |
| Disproportionality  (Gallagher Index) | 0.01 (0.01) | -0.04\*\* (0.01) | 0.01 (0.01) | 0.00 (0.01) | 0.01 (0.01) | 0.01 (0.01) |
| Effective no. of parties | -0.12\*\* (0.04) | -0.12\*\*\* (0.03) | -0.06 (0.04) | -0.10\* (0.04) | -0.12\*\* (0.04) | -0.12\*\* (0.04) |
| Distance 1. and 2. party | 0.06 (0.05) | 0.03 (0.05) | 0.01 (0.05) | 0.01 (0.05) | 0.05 (0.05) | 0.06 (0.05) |
| Population (log.) | -0.41\*\*\* (0.10) | -0.31\* (0.16) | -0.28\*\* (0.10) | -0.44\*\*\* (0.09) | -0.41\*\*\* (0.10) | -0.41\*\*\* (0.10) |
| GDP per capita (log.) | 0.18 (0.19) | 0.01 (0.18) | 0.23 (0.22) | 0.09 (0.20) | 0.17 (0.19) | 0.18 (0.19) |
| Constant | 24.14 (29.61) | 2.97 (18.50) | 73.09\*\* (22.71) | -0.87 (21.98) | 2.93 (18.49) |  |
| Pseudo R² | 0.09 | 0.13 | 0.13 | 0.11 | 0.11 | 0.13 |
| N (individuals) | 104,827 | 88,034 | 82,279 | 88,034 |  | 88,034 |
| N (countries) | 21 | 21 | 21 | 21 |  | 21 |
|  |  |  |  |  |  |  |

Standard errors in parentheses. + p<0.1 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001.

Note: This table shows the coefficients of logistic regression models with standard errors clustered within country-years.