**Appendix for**

**"Median Voter and Power Resources Revisited:**

**A Composite Model of Inequality"**

**18 Countries included**: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and United States

**Descriptive Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
| Left seat | 465 | 41.71  | 14.69  | 3 | 67.1 |
| Left vote | 465 | 40.30  | 11.43  | 7 | 57.1 |
| Corporatism | 465 | 3.05  | 1.38  | 1 | 5 |
| Union density | 464 | 39.12  | 21.80  | 7.6 | 87.4 |
| MMR | 465 | 1.12  | 0.16  | 1.01  | 2.37  |
| Redistribution | 235 | 36.24  | 8.94  | 21.7 | 52.1 |
| Turnout | 465 | 75.81  | 11.54  | 42.25 | 95.83 |
| GDP per capita | 465 | 22255.57  | 9860.3  | 3790.55 | 60479.8 |
| Gov. exp. | 465 | 20.28  | 3.69  | 11.09 | 29.9 |
| Manufact. employ | 465 | 17.43  | 4.04  | 8.91  | 29.91  |
| Unemployment | 465 | 7.42  | 3.45  | 1.49  | 19.53  |
| Female labor | 416 | 56.61  | 12.54  | 25.79  | 80.96  |
| Old age population | 465 | 14.35 | 2.40 | 8 | 20.5 |
| Debt | 382 | 51.69  | 28.40  | 6.0  | 118.3  |
| ENPP | 465 | 3.52  | 1.45  | 1.69 | 9.05 |

**Correlation Figures**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 　 | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| (1) Left seat | 1 |  |  |  |  |  |  |  |  |  |  |  |  | 　 |
| (2) Corporatism | 0.22  | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| (3) Union density | 0.20  | 0.48  | 1 |  |  |  |  |  |  |  |  |  |  |  |
| (4) MMR | 0.04  | -0.63  | -0.36  | 1 |  |  |  |  |  |  |  |  |  |  |
| (5) Redistribution | 0.15  | 0.67  | 0.77  | -0.47  | 1 |  |  |  |  |  |  |  |  |  |
| (6) Turnout | 0.27  | 0.31  | 0.41  | -0.37  | 0.47  | 1 |  |  |  |  |  |  |  |  |
| (7) GDP per capita | 0.00  | -0.16  | -0.21  | 0.38  | -0.17  | -0.41  | 1 |  |  |  |  |  |  |  |
| (8) Gov. exp | 0.02  | 0.34  | 0.72  | -0.41  | 0.80  | 0.55  | -0.37  | 1 |  |  |  |  |  |  |
| (9) Manufacturing | 0.11  | 0.40  | 0.43  | -0.35  | 0.46  | 0.03  | -0.40  | 0.29  | 1 |  |  |  |  |  |
| (10) Unemployment | -0.24  | -0.16  | 0.05  | 0.14  | 0.10  | 0.10  | -0.23  | 0.16  | 0.04  | 1 |  |  |  |  |
| (11) Female labor | 0.23  | -0.04  | 0.45  | 0.07  | 0.11  | -0.16  | 0.38  | 0.15  | 0.03  | -0.50  | 1 |  |  |  |
| (12) Old age pop. | 0.33  | 0.53  | 0.60  | -0.21  | 0.65  | 0.06  | 0.17  | 0.39  | 0.43  | -0.34  | 0.57  | 1 |  |  |
| (13) Debt | -0.13  | 0.14  | 0.39  | -0.04  | 0.52  | 0.11  | -0.02  | 0.51  | 0.17  | 0.25  | -0.07  | 0.33  | 1 |  |
| (14) ENPP | -0.08  | 0.64  | 0.40  | -0.41  | 0.54  | -0.07  | 0.15  | 0.16  | 0.32  | -0.08  | 0.03  | 0.53  | 0.46  | 1 |

**Robustness Tests**

***Explaining Left Vote Share***

As mentioned in the article, the insignificance of every variable except MMR in all specifications in the tests of H1 could be a source of concern. First, I suspect this may be due to the use of two sets of fixed effects absorbing ‘too much’ variation. If country fixed effects are removed from model M1 in Table A1, the magnitude of the coefficients of MMR is reduced, but remains significant at the 10% level. No other variable, except ENPP, is significant at conventional levels. Similar things occur when year dummies are replaced by decadal ones in model M2. The second reason might be the change in politics over time. Separate regressions are run for observations before and after 1989 (mid-point in the panel) in models M3 and M4. The distinction is immediately obvious: in the earlier time period, four other variables are significant, but not MMR; in the more recent period, only MMR and turnout are significant. In the 70s and 80s, corporatism, union density, and manufacturing employment all increased votes for the left (the direction of turnout is unexpected due to the inclusion of MMR; it would become insignificant if MMR is excluded). These factors were no longer predictors of voting behaviors from the 90s, and in fact there was an increase in the influence of the median voter on election results, demonstrated in the rise in magnitude and significance of MMR, and the insignificance of most other factors, in M4. It is not that voters stop voting according to class lines (or the median voter result would not appear), but the distribution of income becomes the overriding concern of the electorate, over the role of unions or even occupational status.

***Measures of Redistribution***

The study uses the redistribution measure provided by Mahler and Jesuit (2006, 2008). However, there are some limitations to this measurement. First, the scope of this dataset is relatively small in terms of time (up to 2004) and case coverage. Second, despite the advantage of using the reduction of inequality as redistribution, it could be argued that this measure is limited as it does not account for a wide range of other public goods provision. As a result, two alternative measurements of redistribution are used. First, in the *Comparative Welfare States* (CWS)dataset, Brady *et al*. (2014) provided figures for both pre- and post-fisc inequality among households (with head of the household aged 25-59) by relying on the LIS database. Here, I have created the variable ‘Redist-CWS’ as the distance between pre- and post-fisc inequality, a similar redistribution measure as the primary one I use by Mahler and Jesuit (2006, 2008). While it provides much better coverage (all 18 countries are included), I did not use it as the primary measure as it is unclear how the dataset handles some of the minor sources of income, unlike Mahler and Jesuit (2006) (the authors of the CWS also did not discuss whether it is appropriate for the two series to be used this way). In any event, in model M6 of Table A2, the result returned by this alternative indicator is very similar.

Redistribution can also be operationalized as an input, i.e., social spending. This is another common way of measuring redistribution (e.g., Rueda, 2008). The variable used here is total public social expenditure as a share of GDP (OECD, 2013; Brady *et al*., 2014). Estimations with this alternative indicator can be found in Table A2 model M7. Although it seems to be the case that the result is *more* robust (the main variables all increase in magnitude and level of significance with the exception of MMR), as I discuss in the manuscript, interaction models should always be interpreted in terms of the dynamics of the effects, such as focusing on marginal effects (e.g., Brambor *et al*., 2006). This is done in Figure A1. All main variables, including the interaction term, can be seen to have increased in magnitude and the level of significance, but the graph of marginal effects says otherwise: the effect of left seat share on social spending does not depend on the corporatism.

However, while this result could be taken as evidence against the robustness of the main findings, it could also arise from the change in the redistribution. It is not surprising that different political dynamics apply when we consider welfare input (e.g., social spending) versus output (the reduction in Gini). The different conclusions previously reached also attest to this being a likely scenario (Rueda, 2008; Beramendi and Cusack, 2009). This point is tackled in the Discussion section in the article. In short, although a similar pattern in social spending can be identified, the same dynamics between partisanship and corporatism cannot be expected. This provides another justification for conceiving redistribution as a Gini reduction in this research. A detailed discussion of the dynamics underlying welfare input and output, unfortunately, must be left for future research.

***Fixed Effects Estimations***

As discussed in the Research Design section, a two-way fixed effects design is used for all main tests. However, since fixed effects take away all variations of interest of the cross-sectional dimension (i.e., across countries with country dummies included), Plumper, Troeger, and Manow (2005) warn against using this design if we are interested in the effect of independent variables on the initial levels of dependent variables. In this study, H3 is affected as initial power resources should have an effect on the initial level of redistribution and income inequality. The regression without unit fixed effects is presented in Table A3 model M9. The effects of MMR and left seat share are similar in size and level of significance. However, union density has become insignificant. As they are both measurements of power resources, it can be concluded that H3 is robust to these alternative specifications. Both the position of the median voter (current MMR) and power resources determine future MMR. However, the effects of union density are more prominent within a single case than across cases.

***Lagged Dependent Variable***

In studies with a time-series cross-sectional design, it is quite common to include a lagged dependent variable (LDV) (Beck and Katz, 1995), but this method has been criticized by others as it suppresses the effects of other dependent variables (e.g., Achen, 2000; Huber and Stephens, 2001, 2012). A potential problem of LDV with country-specific intercepts is that it can lead to biased estimates by inducing correlation between the centered error term and the centered lagged dependent variable (Nickell, 1981; Behr, 2003; Adolph et al., 2005; but see Beck and Katz, 2011). Different viewpoints regarding LDV can also be found in the literature on inequality (e.g., Rueda [2008] and Pontusson *et al*. [2002] included a LDV while Bradley *et al*. [2003] and Beramendi and Cusack [2009] did not).

H3 is operationalized similar to an LDV set-up, so robustness tests for H1 and H2 with an LDV are performed. The results are reported in Table A1 model M5 and Table A2 model M8. Although there is a drop in the magnitude and significance level in the variables of interest, a similar and significant result can be found. A lag length of 2 years is chosen as it can absorb serial correlation (based on the Lagrange multiplier test suggested by Beck [2001: 279-280]) while returning a similar result. A higher lag length will return more significant coefficients but will not sufficiently account for serial correlation. It is acknowledged that a lag length of 1 year would render the results insignificant. This may be due to the issue of LDV suppressing the power of other independent variables as suggested by Achen (2000). A 1-year LDV explains almost all variations of interest in H1 and H2 (over 90% of both left vote and redistribution). However, this should be expected in a panel with a large number of interpolated observations. I discuss the problem of interpolation below.

***Stationarity and Error Correction Models***

Another concern underlying this research is that some measures may potentially be non-stationary, which would lead to the problem of spurious regression. In this section, I test stationarity and alternative specifications to better address the problem. MMR and Redistribution over time for each country are shown in Figures A2 and A3. It would appear that stationarity is indeed a problem, at least in the case of MMR for some countries. Following Morgan and Kelly (2013), two groups of tests are performed to determine (1) whether the level of the variables included is stationary; and (2) whether the residuals of regressions on unit-root explanatory variables are stationary.

The first test focuses on the level form of all main variables. The Fisher-type (based on the Dickey-Fuller test) unit root test is used. A lag length of 2 is chosen (the suitable lag length is always between 1 and 2 according to the AIC performed with the Im-Pesaran-Shin test). The results are presented in Table A4 below. A significant test statistic indicates a rejection of a unit root.

The existence of a unit root in several variables, including MMR and Redistribution, is actually a cause of concern, and further tests are conducted to investigate the plausibility of the results and estimations. As discussed, the next step repeats the unit root test on the residuals from regressions of the dependent variables (i.e., Redistribution in H2 and MMR in H3) on the unit root explanatory variables in level form. The results are reported in Table A5. Perhaps most importantly, the residual from the pair Redistribution-MMR is stationary.

Still, the stationarity of other explanatory variables might influence the reliability of the main variables, so I perform an alternative estimation method by using an Error Correction Model (ECM). A simple ECM can be expressed as the following equation:

△Y t = α0 +α1 Y t-1 + β1 △X t +β2 X t-1 + εt

The distinctive feature of this model is that there are two parameters to estimate for each independent variable X: one for the differenced variable (β1) and one for the lagged level of X (β2). An explanatory variable can be considered significant if either of them indicates a statistically significant relationship. β1 represents the initial change in Y associated with a shock to X known as the ‘short-term’ effect, which will wholly occur at a specific point in time (but not that the effect is not permanent). The ‘error correction component’ of the model consists of α1, which is called the error correction rate, and β2. As opposed to the short-term effect, the ‘long-term’ effect is the portion of the effect distributed over time so it is felt in each period over a time span. The size of the effect is calculated by dividing β2 by α1. ECMs then allow us to estimate the immediate effects, and those that are spread over time, of the explanatory variables.

Some argue that using an ECM imposes the fewest possible restrictions in the estimation process (e.g., De Boef and Keele 2008). De Boef and Keele (2008) go as far as to suggest that the ECM is suitable for stationary and integrated data and there is no need to discuss unit roots, cointegration, and long-run equilibria. An ECM then enables us to minimize the possibility of spurious regressions arising from integrated or near-integrated series.

However, even if De Boef and Keele (2008) are correct, we should always ensure that a true long-run relationship is present when ECM is used with integrated data. That is, the residuals of a regression on a unit-root explanatory variable must be stationary. Therefore, in the ECM estimations below, the variables with non-stationary residuals (Table A5) are excluded to ensure the validity of the results (including them does not affect the outcome). While H3 hypothesizes that a 3-year gap should be allowed for the effects to materialize, it is less clear whether this design is required in an ECM. I have tested using both concurrent MMR and MMR lead by 3 years as the dependent variables here.

The results of the ECMs are shown in Table A6. Model M11 replicates the results of H2. It can be seen that the effects match those reported in the article and an interaction effect similar to Figure 3 in the article is replicated. MMR demonstrates a positive, short-term effect on redistribution and a long-term interactive effect between left partisanship and corporatism. For H3, the left seat share has a long-term effect on MMR with a 3 year time lag (model M12), and union density a short-term effect (p<0.1) on the concurrent MMR (model M13). The two results may be a better reflection of the underlying significance of both terms reported in the article. This finding also justifies the choice of a 3-year gap allowed for the policies to come into effect. Finally, given that the results in the article are largely similar to those returned from the ECM, they are kept for the ease of interpretation, particularly for interaction terms.

***Missing Data***

While interpolation could be a justifiable strategy for handling data with gaps between observations (e.g., LIS data), there are concerns about this method, particularly when the proportion of interpolated data is large. First, robustness tests with non-interpolated data are conducted. However, this setup is not applicable for H3 with a component over time. While it can potentially be estimated, it would require a more complex model and more importantly, render the estimations and interpretation different across the hypotheses. Replications for H1 and H2 using only non-interpolated data, and results for H1 with only observations in election years (country-election as unit of analysis) can be found in Table A7. Similar results can be obtained.

Alternatively, multiple imputation can be used to tackle the problem of missing data, and is recommended by some scholars (e.g., Honaker and King, 2010). I prefer linear interpolation over multiple imputation in this research, although I agree with the statistical superiority of imputation over list-wise deletion. MMR and Redistribution are both slow-changing series, so linear interpolation adds in valuable information that would otherwise be lost in an imputed dataset. According to Honaker and King (2010: 562), list-wise deletion after interpolation can be problematic (see also Little and Rubin, 2002). However, I argue that this problem is less severe for my dataset, as I performed interpolation for gaps in between observations, so was able to include the entire time period covered by the first to the last LIS survey. In a sense, the time period not covered by the survey can be considered to be ‘external’ to the dataset (e.g., Denmark before 1987 or Japan, where only one survey was done in 2008) and their exclusion should not pose a problem. On the contrary, even though the method of imputation could be applied, it does not make much sense to include the case of Japan and impute all observations for it from 1970-2009, except 2008. An alternative solution might be to use imputation but to limit the scope of analysis to the period covered by surveys (e.g., Denmark from 1987 onwards, the US from 1974 onwards). This is what I do next.

The software Amelia II developed by Honaker *et al*. (2009) is used as it enables imputation to be performed with a cross-sectional unit, as if fixed effects were used. The results are shown in Table A7. Although the results are weaker, H1 and H3 both hold. For H2, however, it is acknowledged that the interaction effect between left partisanship and corporatism cannot be replicated, and instead, union density becomes significant at p<0.01. I argue that this may be a reflection of the difference between interpolation and imputation, as interpolation (which is used in the main tests) takes into account the slow-changing nature of both MMR and redistribution, so the additional information allows for the testing of a more nuanced hypothesis. Imputation treats the gaps in between as sources of uncertainty and thus the interaction effects cannot be discerned. This makes union density significant, as they are closely related. From a wider perspective, the effects of both median voter and power resources on redistribution can be confirmed regardless of how we handle missing data.

A final way to operationalize panel data is to aggregate observations into 5-year averages. This can reduce the influence of interpolation and perhaps even concerns about autocorrelation. With this dataset, the main results of all hypotheses can be replicated, and are given in the last three columns of Table A7. The exception here is the effect of MMR in H2. Although the magnitude of the effect is comparable to the estimation in other models, the uncertainty is too high for it to reach statistical significance. Following the discussion above, collapsing the dataset can cause important variations underlying the effects of MMR to be discarded. Taking all alternative estimations in Table A7 together, while it could be concluded that H2 is weaker, the overall results do not appear to be sensitive to the method of linear interpolation.

***Mediation Analysis***

Based on the framework estimated, it appears to be the case that the relationship between MMR, left vote share, and redistribution can be estimated by structural equation modeling and the causal mediation framework developed by Imai and others (e.g., Imai *et al*., 2011). The framework is used to identify causal mechanisms with mediation. For our purpose, the relationship can be simplified as:

The direct and indirect effects of MMR on redistribution can be decomposed into two equations (Baron and Kenny, 1986; Imai *et al*., 2011):

 *Left vote i* = *α*1 + *β*1 *MMR i* + *ξ*1 *Xi* + *ε*i1 ,

 *Redistribution i* = *α*2 + *β*2 *MMR i* + δ*Left vote i* + *ξ*2 *X'i* + *ε*i2 ,

where *X* and *X*’ are vectors of control variables for the respective dependent variables, and the direct and indirect effects of MMR on redistribution are represented by *β*2 and *β*1 ×δ, respectively. However, it must be noted that the estimations below are different from those reported elsewhere in several important ways. First, as this framework is developed for identifying the effect of a ‘treatment,’ MMR has to be transformed into a binary treatment variable (0/1). Two treatment variables are developed: MMR as high/low (cut-off at mean across all observations) or an increase in MMR (increase = 1) as compared to last year. Both methods discard a lot of potentially useful variations, in particular the cross-national differences in the former. Second, given the change in the operationalization of MMR, it is no longer efficient to use the fixed effects estimation throughout the article and other tests, and thus the estimations here do not include fixed effects. Third, the temporal dynamics (e.g., AR(1)) are not modeled in this estimation. To the best of my knowledge, these problems cannot be resolved in the current mediation analysis framework, which is why this method is still primarily used in survey research (except Bates and Block, 2013; however, their treatment variable allows for the inclusion of fixed effects in a time-series cross-sectional study). Finally, left vote is used as the intervening variable here, which is different from the vote share/seat share design in the article. Given the differences, the results here are reported for further discussion. It would be interesting to see how they change as the framework is further developed.

The results of the mediation analysis are shown in Table A8, and are similar regardless of the transformation of MMR into a treatment variable. MMR is found to indirectly affect redistribution through left vote share, but has an insignificant effect on redistribution directly. This is confirmed by the estimation of the average causal mediation effect and average direct effect (Imai *et al*., 2011). Again, this should not be taken as evidence against the results presented in the article; instead, we can see that a different dynamic can be found, based on largely cross-national variations with this analysis (among other differences).

**Table A1. Robustness Tests for H1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | M1 | M2 | M3 | M4 | M5 |
| Dependent variable | Left vote | Left vote | Left vote | Left vote | Left vote |
| Period | 　 |  | 1970-1989 | 1990-2009 |  |
| MMR | 4.46\* | 4.36\*\* | 3.26 | 7.35\*\* | 3.53\* |
|  | (2.30) | (2.14) | (6.16) | (3.33) | (1.90) |
| Corporatism | 0.070 | 0.074 | 0.27\* | -0.20 | 0.0064 |
|  | (0.16) | (0.12) | (0.16) | (0.33) | (0.17) |
| Union density | 0.023 | 0.0073 | 0.17\* | 0.061 | 0.046 |
|  | (0.054) | (0.071) | (0.10) | (0.11) | (0.062) |
| ENPP | -0.87\*\* | -0.82\*\*\* |  |  | -0.54\* |
|  | (0.35) | (0.28) |  |  | (0.30) |
| Lagged DV (2-year) |  |  |  |  | 0.30\*\*\* |
|  |  |  |  |  | (0.061) |
| GDP per capita | 0.00012 | 0.00011\* | 0.00066 | 0.000097 | 0.00011 |
|  | (0.000083) | (0.000063) | (0.00056) | (0.00015) | (0.000091) |
| Gov. exp. | 0.041 | -0.071 | 0.082 | -0.035 | -0.061 |
|  | (0.13) | (0.15) | (0.13) | (0.12) | (0.18) |
| Unemployment | -0.048 | -0.085 | 0.31 | -0.16 | 0.026 |
|  | (0.068) | (0.12) | (0.20) | (0.17) | (0.13) |
| Turnout | -0.0022 | 0.0019 | -0.13\*\*\* | 0.038\* | -0.0081 |
|  | (0.030) | (0.017) | (0.023) | (0.022) | (0.024) |
| Manufact. employ | 0.40 | 0.37 | 2.24\*\*\* | 0.74 | -0.048 |
|  | (0.36) | (0.25) | (0.44) | (0.62) | (0.30) |
| Country FE | N | Y | Y | Y | Y |
| Time FE | Year | Decade | Year | Year | Year |
| N, #Countries | 464, 18 | 464, 18 | 144, 14 | 269, 14 | 464, 18 |
| rho | 0.89 | 0.82 | 0.69 | 0.72 | 0.62 |
| R-squared | 0.582 | 0.799 | 0.964 | 0.855 | 0.884 |

*Notes*: Dependent variable is vote share obtained by left parties. Parameters are estimated by the Prais-Winsten estimator with panel-corrected standard error in parentheses. The common AR(1) parameter is denoted by rho. Constant terms included in all models but not reported. Model M4 only covers the countries included in model M3 for comparison. MMR = Mean-median ratio; ENPP = Effective number of parliamentary parties.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A2. Robustness Tests for H2**

|  |  |  |  |
| --- | --- | --- | --- |
| Model | M6 | M7 | M8 |
| Dependent variable | Redist-CWS | Social exp. | Redist. |
| MMR | 4.25\*\* | 1.49\*\*\* | 3.35\*\* |
|  | (1.86) | (0.54) | (1.54) |
| Left seat | -0.018 | -0.055\*\*\* | -0.015 |
|  | (0.012) | (0.020) | (0.023) |
| Corporatism | -0.34\*\* | -0.43\*\* | -0.81\* |
|  | (0.15) | (0.20) | (0.44) |
| Left seat\*Corporatism | 0.0070\*\* | 0.010\*\* | 0.017\* |
|  | (0.0031) | (0.0051) | (0.0091) |
| Union density | 0.017 | -0.027 | 0.029 |
|  | (0.026) | (0.030) | (0.029) |
| Lagged DV (2-year) |  |  | 0.72\*\*\* |
|  |  |  | (0.072) |
| ENPP | 0.29 | -0.21 | -0.14 |
|  | (0.24) | (0.14) | (0.13) |
| GDP per capita | -0.000039 | -0.000042 | 0.000043 |
|  | (0.000096) | (0.000064) | (0.000082) |
| Gov. exp. | 0.091 | 0.48\*\*\* | 0.19\*\* |
|  | (0.078) | (0.079) | (0.090) |
| Growth | -0.0089 | -0.11\*\*\* | -0.043 |
|  | (0.027) | (0.039) | (0.033) |
| Unemployment | 0.035 | 0.14\*\*\* | 0.092 |
|  | (0.055) | (0.034) | (0.067) |
| Turnout | 0.014 | 0.017 | 0.012\* |
|  | (0.0095) | (0.015) | (0.0069) |
| Debt | 0.027\* | -0.00069 | -0.026\* |
|  | (0.016) | (0.0095) | (0.015) |
| Old-age population | -0.92\*\* | 0.082 | 0.62\* |
|  | (0.39) | (0.12) | (0.35) |
| Country FE | Y | Y | Y |
| Year FE | 1980-2008 | 1980-2009 | 1982-2004 |
| N, #Countries | 318, 18 | 382, 18 | 182, 16 |
| rho | 0.95 | 0.65 | 0.90 |
| R-squared | 0.524 | 0.940 | 0.986 |

*Notes*: Dependent variables are measures of redistribution and social expenditure. Parameters are estimated by the Prais-Winsten estimator with panel-corrected standard error in parentheses. The common AR(1) parameter is denoted by rho. Constant terms included in all models but not reported. MMR = Mean-median ratio; ENPP = Effective number of parliamentary parties.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Figure A1. Marginal Effect of Left Seat Share on Social Expenditures**

*Notes:* Graph of marginal effect of share of left party seats on social expenditures as corporatism changes. The broken lines represent the 95% confidence interval for two-tailed tests. Plotted with the coefficient matrix and the variance-covariance matrix of model M7 (Table A2). See Brambor *et al*. (2006) for a description of the methods and the computer code used to generate the graph.

**Table A3. Robustness Tests for H3**

|  |  |  |
| --- | --- | --- |
| Model | M9 | M10 |
| Dependent variable | MMR t+3 | MMR t+3 |
| MMR | 0.88\*\*\* | 0.78\*\*\* |
|  | (0.031) | (0.058) |
| Left seat | -0.00055\*\*\* | -0.00051 |
|  | (0.00018) | (0.00039) |
| Corporatism |  | 0.0024 |
|  |  | (0.0068) |
| Left seat\*Corporatism |  | 1.6e-06 |
|  |  | (0.00014) |
| Union density | 0.00030 | -0.0023\*\*\* |
|  | (0.00021) | (0.00068) |
| ENPP | -0.0082\*\*\* | -0.0027 |
|  | (0.0029) | (0.0030) |
| GDP per capita | -7.3e-07 | 3.9e-06\*\* |
|  | (9.2e-07) | (1.5e-06) |
| Gov. exp. | -0.0012 | 0.0014 |
|  | (0.00092) | (0.0025) |
| Growth | -0.0011\* | -0.00088 |
|  | (0.00062) | (0.00085) |
| Unemployment | -0.0038\*\*\* | -0.0034\*\* |
|  | (0.0010) | (0.0014) |
| Female labour | -0.00090\* | 0.0013 |
|  | (0.00049) | (0.0010) |
| Manufact. employ | -0.0025\*\* | -0.0088\*\* |
|  | (0.0012) | (0.0039) |
| Country FE | N | Y |
| Year FE (1970-2007) | Y | Y |
| N, #Countries | 416, 18 | 416, 18 |
| rho | 0.84 | 0.81 |
| R-squared | 0.933 | 0.947 |

*Notes*: Dependent variable is mean-median ratio lead by 3 years. Parameters are estimated by the Prais-Winsten estimator with panel-corrected standard error in parentheses. The common AR(1) parameter is denoted by rho. Constant terms are included in all models. MMR = Mean-median ratio; ENPP = Effective number of parliamentary parties.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Figure A2. Trends of Redistribution by Country**

*Notes:* Redistribution based on Gini reduction. Data from Mahler and Jesuit (2008).

**Figure A3. Trends of MMR by Country**

*Notes:* Mean-to-median income ratio. Data from Luxembourg Income Study (2015) surveys.

**Table A4. Unit Root Tests for All Variables**

|  |  |
| --- | --- |
| Variable | Significance |
| Left seat | 0.00  |
| Left vote | 0.00  |
| Corporatism | 0.00  |
| Union density | 0.09  |
| MMR | 1.00  |
| Redistribution | 0.39  |
| Turnout | 0.55  |
| GDP per capita | 1.00  |
| Gov. exp. | 0.67  |
| Growth | 0.00  |
| Manufact. employ | 0.87  |
| Unemployment | 0.00  |
| Female labour | 0.53  |
| Old-age population | 1.00  |
| Debt | 0.19  |
| ENPP | 0.01  |

*Notes*: Fisher-type unit root test based on augmented Dickey-Fuller tests. Performed with xtunitroot package of STATA. Null hypothesis indicates unit root. Significant statistic indicates rejection of unit root.

**Table A5. Unit Root Tests of Residuals from Regressions on Unit Root Explanatory Variables**

|  |  |  |
| --- | --- | --- |
| Dependent Variable | Explanatory Variable | Significance |
| Redistribution | MMR | 0.06  |
| Redistribution | GDP per capita | 0.72  |
| Redistribution | Gov. exp. | 0.32  |
| Redistribution | Old-age population | 0.01  |
| Redistribution | Debt | 0.03  |
| Redistribution | Turnout | 0.09  |
| MMR | GDP per capita | 0.19  |
| MMR | Gov. exp. | 0.95  |
| MMR | Manufact. employ | 0.86  |
| MMR | Female labour | 0.99  |

*Notes*: Fisher-type unit root test based on augmented Dickey-Fuller tests. Performed with xtunitroot package of STATA. Null hypothesis indicates unit root. Significant statistic indicates rejection of unit root.

**Table A6. Error Correction Models**

|  |  |  |  |
| --- | --- | --- | --- |
| Model | M11 | M12 | M13 |
| Dependent Variable | ∆Redistribution | ∆MMR t+3 | ∆MMR t |
| Dependent Variable t-1 | -0.0026 | 0.13\*\*\* | 0.072\*\*\* |
|  | (0.024) | (0.020) | (0.021) |
| ∆ MMR | 12.5\*\*\* |  |  |
|  | (2.32) |  |  |
| MMR t-1 | 0.071 |  |  |
|  | (0.97) |  |  |
| ∆ Left seat | 0.016 | 0.00027 | 0.00020 |
|  | (0.026) | (0.00035) | (0.00043) |
| Left seat t-1 | -0.049\*\* | -0.00057\*\*\* | 2.7e-07 |
|  | (0.023) | (0.00020) | (0.00020) |
| ∆ Union density | 0.036 | -0.0011 | -0.0020\* |
|  | (0.027) | (0.00094) | (0.0011) |
| Union density t-1 | -0.012 | 0.000062 | 0.000024 |
|  | (0.016) | (0.00049) | (0.00041) |
| ∆ Corporatism | 0.32 |  |  |
|  | (0.45) |  |  |
| Corporatism t-1 | -1.33\*\*\* |  |  |
|  | (0.38) |  |  |
| ∆ Left seat\*Corporatism | -0.0057 |  |  |
|  | (0.0090) |  |  |
| Left seat\*Corporatism t-1 | 0.024\*\*\* |  |  |
|  | (0.0073) |  |  |
| ∆ ENPP | 0.099 | -0.0037 | 0.0047 |
|  | (0.19) | (0.0040) | (0.0058) |
| ENPP t-1 | -0.30\* | 0.0024 | 0.0031 |
|  | (0.16) | (0.0034) | (0.0038) |
| ∆ Growth | 0.022 | -0.0017 | 0.00096 |
|  | (0.032) | (0.0012) | (0.0012) |
| Growth t-1 | -0.13\*\*\* | 0.0029\*\* | -0.00027 |
|  | (0.046) | (0.0014) | (0.0018) |
| ∆ Unemployment | -0.071 | 0.0018 | 0.0056\*\* |
|  | (0.071) | (0.0019) | (0.0022) |
| Unemployment t-1 | 0.076\* | -0.0017\*\* | -0.00013 |
|  | (0.038) | (0.00068) | (0.00095) |
| ∆ Turnout | 0.020\*\* |  |  |
|  | (0.0099) |  |  |
| Turnout t-1 | -0.019 |  |  |
|  | (0.012) |  |  |
| ∆ Debt | 0.011 |  |  |
|  | (0.013) |  |  |
| Debt t-1 | -0.029\*\*\* |  |  |
|  | (0.0092) |  |  |
| ∆ Old-age population | 0.15 |  |  |
|  | (0.73) |  |  |
| Old-age population t-1 | 0.33\*\* |  |  |
|  | (0.15) |  |  |
| Country FE | Y | Y | Y |
| Year FE | 1980-2004 | 1980-2006 | 1980-2009 |
| N | 182 | 388 | 442 |
| R-squared | 0.714 | 0.553 | 0.394 |

*Notes*: Dependent variables are change in redistribution (M11), change in MMR (with 3-year lag; M12), and change in current MMR (M13). OLS estimates with robust standard errors in parentheses. Constant terms are included in all models. MMR = Mean-median ratio; ENPP = Effective number of parliamentary parties.

\*\*\*p=0.01. \*\*p=0.05. \*p=0.10.

**Table A7. Robustness Tests for Missing Observations**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 　 | Election-year only | Non-interpolated | Multiple imputation (m=5) | 5-year periods |
| Hypothesis | H1 | H1 | H2 | H1 | H2 | H3 | H1 | H2 | H3 |
| Dependent variable | Left vote | Left vote | Redist. | Left vote | Redist. | MMR t+3 | Left vote t+1 | Redist t+1. | MMR t+1 |
| MMR | 9.77\*\* | 7.45\*\*\* | 3.55\* | 4.56\* | 10.86\*\*\* | 0.33\*\*\* | 2.98\*\* | 6.53 | 0.76\*\*\* |
|  | (4.36) | (2.18) | (2.54) | (2.45) | (3.22) | (0.12) | (1.29) | (6.79) | (0.051) |
| Left seat |  |  | -0.11\*\*\* |  | 0.028 | 0.0013 |  | -0.07\*\*\* | 0.0012 |
|  |  |  | (0.041) |  | (0.086) | (0.0015) |  | (0.020) | (0.00072) |
| Corporatism | -0.17 | -1.81 | -1.47\*\* |  | -1.18 | -0.00083 | 0.72 | -1.10\*\*\* | 0.011 |
|  | (0.62) | (1.23) | (0.64) |  | (1.58) | (0.034) | (0.44) | (0.33) | (0.012) |
| Left seat\*Corporatism |  |  | 0.033\*\* |  | 0.013 |  |  | 0.02\*\*\* |  |
|  |  |  | (0.013) |  | (0.017) |  |  | (0.0054) |  |
| Union density | 0.13 | 0.12 | 0.058 |  | 0.25\*\*\* | -0.0090\* | -0.055 | 0.30 | -0.0048\*\* |
|  | (0.16) | (0.11) | (0.072) |  | (0.093) | (0.0050) | (0.057) | (0.19) | (0.0022) |
| N | 140 | 119 | 79 | 351 | 351 | 312 | 101 | 48 | 99 |
| R-squared | 0.932 | 0.920 | 0.975 | - | - | - | 0.928 | 0.980  | 0.862 |

*Notes*: Models estimated by Prais-Winsten estimations with full set of controls and country fixed effects included. Robust standard error in parentheses. Multiple imputation performed with Amelia II (Honaker *et al*., 2009). N is larger in the imputed datasets as there are time periods that is covered by either Redistribution or MMR only (that would be dropped in the main results as no extrapolation was done). MMR = Mean-median ratio.

**Table A8. Mediation Analysis**

|  |  |  |
| --- | --- | --- |
| Treatment | MMR High/Low (1/0) | MMR Increase (1/0) |
| Dependent variable | Left vote | Redistribution | Left vote | Redistribution |
| MMR (Treatment) | 9.75\*\*\* | 0.10 | 3.27\*\* | -0.76 |
|  | (2.20) | (0.82) | (1.50) | (0.47) |
| Left vote |  | 0.13\*\*\* |  | 0.13\*\*\* |
|  |  | (0.04) |  | (0.04) |
| Corporatism | 0.67 | 4.16\*\*\* | -0.14 | 3.92\*\*\* |
|  | (0.68) | (1.06) | (0.67) | (1.06) |
| Union density | 0.10\*\* | 0.02 | 0.08\* | 0.02 |
|  | (0.05) | (0.02) | (0.05) | (0.02) |
| N | 191 | 191 | 191 | 191 |
| R-squared | 0.30  | 0.91 | 0.24 | 0.90  |
|  | 　 | 95% CI | 　 | 95% CI |
| Average causal mediation effect | 1.24 | [0.35 2.41] | 0.42 | [0.02 0.98] |
| Average direct effect | 0.11 | [-1.43 1.73] | -0.75 | [-1.63 0.18] |
| Average total effect | 1.35 | [-0.33 3.17] | -0.33 | [-1.34 0.68] |

*Notes*: Models estimated by OLS with full set of controls included for Left vote and Redistribution. Standard error in parentheses. Analysis performed with medeff package for STATA (Hicks and Tingley, 2011) based on the mediation analysis framework developed by Imai and others (e.g., Imai *et al.*, 2011). MMR = Mean-median ratio.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

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