Demand for Redistribution and Party Fractionalization: How Does it Impact the Size of Government?*

Elvire Guillaud†

May 12, 2008

Abstract

In this paper, we highlight the link between the political demand and social policy outcome while taking into account the design of the party system. More precisely, the political demand is based on individual preferences and the design of the party system is defined as the extent of party fractionalization. Our argument captures the claim made by Persson, Roland and Tabellini (2007), according to which the degree of fractionalization of political parties has a positive impact on the level of public expenditures. However, we account for an additional channel, so far neglected in the literature: The composition effect of the demand. Indeed, the heterogeneity of the demand, more than the level of the demand itself, is shown to have a positive impact on Welfare State generosity that increases with the degree of fractionalization of the party system. We run regressions on a sample of 18 OECD countries over 23 years, carefully dealing with the issues raised by the use of time-series cross-section data.

Keywords: Political Demand, Party Fractionalization, Redistribution, Time-Series-Cross-Section Data
JEL Code: D78, H10, H53, C33

*This paper is an extension of Amable, Gatti and Guillaud (2008).

†PSE - Paris School of Economics, 48 boulevard Jourdan, 75014 Paris, elvire.guillaud@pse.ens.fr

1 Introduction

The way social expectations are brought together and conveyed into the set of choices of government is a major determinant of public policy outcome. In democracies, coalitions between social groups are generally formed inside the Parliament, which is a central body of national representation where elected parties meet each other and bargain together. The type of competition that governs political parties' negotiation is thus decisive, since it affects both their representativity and the number of parties that will finally accede power.

In this paper, we develop an empirical analysis of the link between the political demand for redistribution and the redistributive policies actually implemented, taking into account the degree of fractionalization of the political supply. This is, to our knowledge, the first attempt in the literature to empirically link the political demand and the policy outcome with the help of a direct measure of preferences, and therefore to consider an interaction term between the demand and the structure of the political supply.

There is a long research tradition in political science that deals with the influence of electoral rules on party structures (Cox, 1990 ; Lijphart, 1994 and 1999). The Duverger's law predicts that the majority rule will lead to a two-party system (Grofman, 2006). The outcome of the elections will be a single-party government much more often that when elections are held under the proportional rule. Indeed, the latter has a positive impact on the fractionalization of political parties and leads to coalition governments (Laver and Schofield, 1990).

Moreover, some recent empirical research in political economics aims at studying the effect of electoral rules on social policy. Results show that majoritarian rule induces lower government spending, smaller budget deficits and more generally less protective Welfare States than proportional rule (Iversen, 2005). However, the mechanism that is behind this result is not clear cut. On one hand, Milesi-Feretti, Perotti and Rostagno (2002) who study the size of goverment and Persson and Tabellini (1999) who consider the composition of government spending, all claim that the electoral rule has an effect on the incentives of politicians, hence on public policy outcome. On the other hand, recent articles by Bawn and Rosenbluth (2006) and Persson, Roland and Tabellini (2007) points out that the electoral rule affects the level of public expenditures through the party structure and the type of government: Compared to single-party governments, coalition governments would lead to higher government expenditures.

An electoral accountability argument is proposed by Bawn and Rosenbluth (2006): Single-party governments, even if they represent heterogeneous social groups, are supposed to internalise more efficiently the cost of their policy, as compared to several small parties that vie together within coalition governments and represent each a single social group. This argument is close to the common-pool problem that arises in centralised decision making, when the costs of a policy are shared while the benefits are concentrated (Weingast, Shepsle and Johnsen, 1981).

Persson, Roland and Tabellini (2007) highlight the fact that economic policy formation is built on electoral conflicts between the government and opposition, but also between parties within coalition governments. Given that the eletorate can discriminate between different parties in a coalition government, the authors conclude (and empirically test) that social spending is higher under coalition governments, due to increased intra-government electoral competition. Finally, they claim that the mechanism that yields to inflate public expenditures under the proportional electoral regime has no direct link with the electoral rule, but instead owes to the fractionalization of political parties:

> "PR induces higher spending than majoritarian elections, but only through more party fragmentation and higher incidence of coalition government. In other words, if we hold the type of government constant, the electoral rule has no direct effect on public spending." (p.158).

In democracies, by definition, political demand has a central role in policy formation. Hence, a proper analysis of economic policy should take into account the role played by the demand. This demand does, however, interact with the structure of the political supply. Indeed, the way heterogeneous demands, when it comes to redistribution or social protection, are conveyed into the policy arena determines the size of public spending or the generosity of the Welfare State. This depends on the structure of the political supply, in terms of party system and electoral rules. Consequently, it is the interaction between the conflictual demands and the way to satisfy them in accordance with the proper objectives of the political parties that determines the final policy equilibrium.

In this perspective, Amable and Gatti (2007) propose a model of determination of the level of employment protection legislation and of the level of redistribution. The model, that builds on Pagano and Volpin (2001, 2005), studies the political equilibria of an economy where three groups of agents live together: employed workers, unemployed and entrepreneurs. As a standard simplification, the model assumes that each party represents a distinct social group. None of the party can win a majority by itself. As a consequence, representative parties of each group form coalitions. The model shows that the redistributive effort of the State is positively correlated to the bargaining power of the "employed workers" group.

The notion of bargaining power can be interpreted with the help of comparative political economy, namely the contributions of Korpi and Palme (2003) and Crepaz (1998). These authors underline that the bargaining power of social groups depends on their capacity to access State decision-making bodies. This access is notably eased by the representation in elected organs (e.g. Parliament). Crepaz (1998) highlights in particular that an increase in the number of "veto points" within the political system raises the representativity of elected bodies and the number of parties present in Parliament. This allows to enlarge the sphere of influence of lower and middle classes. The bargaining power of those is therefore directly linked to the nature of the political supply. This implies that the link between the political demand and the social policy outcome is shaped by the structure of the political system.

Our empirical analysis uses a micro- and a macroeconomic database that covers 18 OECD countries and spans over 23 years (1980-2002). We study the determinants of the generosity of the Welfare State, as measured by a global indicator of generosity elaborated by Scruggs (2004). The political demand is derived from microeconomic data, gathered in ISSP surveys along several years. More specifically, we use information concerning the proportion of individuals that agree with government redistribution, i.e. those who answered positively to the following question: "It is the responsibility of the government to reduce the differences in income between those with high income and those with low income". Finally, we consider the degree of fractionalization of the party system, measured by the fractionalization index of Rae (1967), taken from the database of Armingeon *et al.* (2004). Our argument captures the claim made by Persson, Roland and Tabellini (2007), according to which the degree of fractionalization of political parties has a positive impact on the level of public expenditures. However, we account for an additional channel, so far neglected in the literature: The composition effect of the demand. Indeed, the heterogeneity of the demand, more than the level of the demand itself, is shown to have a positive impact on Welfare State generosity that increases with the degree of fractionalization of the party system.

The paper is organised as follows. In Section 2, we present our estimation strategy. In Section 3, we describe the data used in the empirical analysis. Results of the regressions are presented in Section 4. Section 5 concludes.

2 Estimation Strategy

The study uses time-series cross-section data for 18 OECD countries[1] over the period 1980-2002. Data come from different sources, some microeconomic ones when we deal with the demand for redistribution (ISSP surveys over several years[2]) and other macroeconomic ones when it comes to the size of the State (generosity index from Scruggs, 2004). Moreover, we use political variables that come from the widely-used databases of Armingeon *et al.* (2004), Cusack and Engelhardt (2002) and Huber *et al.* (2004).

2.1 Model Specification

Our baseline model is the following:

$$y_{it} = \beta_1 f_{it} + \beta_2 p_{it} + \beta_{12} f_{it} p_{it} + \delta_t + \epsilon_{it} \tag{1}$$

where $\epsilon_{it} = \eta_i + \mu_{it}$

y_{it} being the overall generosity score of the Welfare State, which is defined by country (i) and by year (t), f_{it} being the level of party fractionalization measured by the Rae formula, p_{it} being either the level or the coefficient of

[1]Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom and USA.

[2]We use data from the following ISSP modules "Social Inequality I, II and III" and "Role of Government I, II and III" that took place in years 1985, 1987, 1990, 1992, 1996 and 1999 (data available at www.gesis.org). To proxy the demand for redistribution, we calculate the share of people who agree with redistribution. In order to have a demand variable that is continuous, and given that mean preferences by country are slowly changing over time, we interpolate the missing points between two surveys and suppose that the demand is invariant over the beginning period 1980-1985. Several robustness check have been done (using the mean answer of individuals with and without weights, using the median answer, dropping some time span), which do not affect the results.

variation of preferences for redistribution, and $f_{it}p_{it}$ being the interaction between party fractionalization and preferences (level or dispersion). In other words, we test a reduced form of a relationship with a complementarity effect. Moreover, country fixed effects and time dummies allow us to control both for shocks that are common to all countries (time dummies δ_t) and specific to one country (country dummies η_i). This specification takes advantage of the time-series cross-section nature of our dataset and allows to control for potential bias caused by omitted variables. Hence, we are interested in the intra-country variation of the generosity of the Welfare State.

In a second specification of our model, we add some of the controls usually found in the literature:

$$y_{it} = \beta_1 f_{it} + \beta_2 p_{it} + \beta_{12} f_{it} p_{it} + \gamma_1 u_{it} + \gamma_2 w_{it-1} + \gamma_3 g_{it} + \delta_t + \epsilon_{it} \qquad (2)$$

u_{it} being the unemployment rate, w_{it-1} being the log of labor productivity in $t-1$ and g_{it} being a measure of the partisanship of the government (continuous left-right index)[3].

Finally, in a third specification, we allow for non linear relationships between variables, as it would make sense according to our descriptive statistics (Figures 10, 11 and 12). To do this, we apply a logarithmic transformation to our dependent and continuous independent variables[4] in equation (1).

2.2 Interaction Term and Marginal Effect

Since we consider an interaction term between fractionalization and preferences ($f_{it}p_{it}$) in equation (1) and (2), the assessment concerning the expected *overall* effect of p_{it} needs the computation of its marginal effect *conditional* on specific values of f_{it} (Mullahy 1999, Braumeoller 2004):

$$\frac{\partial E(y_{it}/\mathbf{x})}{\partial p_{it}} = \widehat{\beta}_2 + \widehat{\beta}_{12} f_{it} \qquad (3)$$

[3]It is worth to notice that we do not include a measure of age dependency (e.g. share of the population below 15 or over 65), since this would be strongly correlated with our demand variable, which is precisely the reason why it is usually included in the literature (Tabellini, 2000).

[4]Doing this means that we run an approximation of a translog CES function without the squared terms, hence assuming that these tend to be zero (Kmenta, 1967).

given that $\mathbf{x}$ is the vector of explanatory variables.

Hence, it is worth to notice that a positive and significant β_2 means nothing but that preferences for redistribution increase the generosity of the State, only for those countries where the degree of party fractionalization is zero ($f_{it} = 0$). That is for the unrealistic case of a single-party legislature[5]. Similarly, in order to assess the significance of the effect of p_{it} on y_{it} conditional on f_{it} values, the standard error of the sum $(\beta_2 + \beta_{12} f_{it})$ will be computed in the following way (Friedrich 1982):

$$se = \sqrt{var(\widehat{\beta}_2) + f_{it}^2 var(\widehat{\beta}_{12}) + 2 f_{it} cov(\widehat{\beta}_2 \widehat{\beta}_{12})} \tag{4}$$

Keeping in mind that the coefficient and standard errors that appear in the output of the regressions are partial ones -and not general ones like in an additive model-, it is not surprising that statistically insignificant (and negative) coefficients might combine to produce statistically significant (and positive) overall effects. Hence in the following, we systematically report marginal effects of preferences for redistribution at different sample values of party fractionalization (minimum, mean minus one standard deviation, mean, mean plus one standard deviation, maximum).

2.3 Coping with Time-invariant Variables and Fixed Effects

Our measure of preferences (p_{it}), be it in level or in dispersion, is considered as a rarely changing variable (Figure 1). This means that the demand for redistribution is almost time-invariant or at least cross-sectionally dominated. Indeed, as shown in the appendix, the *between* variance is more than 3 times higher than the *within* variance (Table 13). Hence, we are confronted to the well-known problem of estimating a fixed effects model with time-invariant variables. The problem comes from the fact that all the effect of the time-invariant variables is likely to be captured by the unit fixed effects. To deal with this issue, we make use of the estimator proposed by Plümper and Troeger (2007): a three-stage panel fixed effects vector decomposition model (FEVD procedure).

[5]This case, actually, could be achieved through a dictatorship, but since we only include democratic countries in our dataset zero party fractionalization never occurs.

The FEVD process allows for the inclusion of time-invariant variables and efficiently estimates almost time-invariant explanatory variables within a panel fixed effects framework. More precisely, the first stage estimates a pure fixed effects model in order to obtain an estimate of the unit effects (here our country effects η_i). The second stage decomposes the fixed effects vector into a part explained by the time-invariant or almost time-invariant variables (here our demand the redistribution p_{it}) and an unexplainable part -the error term of the second stage. Finally, the third stage re-estimates the original model by pooled OLS, including the error term of the second stage. This third step assures to control for collinearity between time-varying and invariant right-hand side variables, and adjusts the degrees of freedom. To complement the estimation process, we apply *panel corrected standard errors* to the third stage pooled-OLS, following Beck and Katz (1995, 1996). Hence, when computing the standard errors and the variance-covariance estimates, the model assumes that the disturbances are heteroskedastic and contemporaneously correlated across panels, and corrects for it as will be detailed in the following.

2.4 Time-Series Cross-Section Issues

There are a number of problems coming with the use of cross-section time-series data. Below, we discuss some of them and the solutions we adopted to deal with them. Specifically, we explain our choice of PCSE estimation process and test whether our data fit the conditions of the method (panel-level heteroskedasticity and contemporaneous spatial correlation, but no temporal autocorrelation). We further deal with dynamic issues and test for stationarity of the data.

2.4.1 Heteroskedasticity and Spatial Correlation

As a start, we run a standard fixed effect model. Indeed, we see the inclusion of fixed effects as a way to allow for heterogeneity. Since our estimated fixed effects are always large and clearly significant, not including them in the model would result in a presumably serious omitted variable bias. However, there are a number of statistical properties to verify while using the fixed effects model.

First, cross-section correlation (spatial correlation) is a problem for fixed effect estimation. Then, after running the fixed effect model, we look at the Breusch-Pagan statistic, that tests for cross-section independance in the residuals[6]. Indeed, a fixed effect model assumes the independence of the errors. A likely deviation from independent errors in the context of pooled cross-section time-series data is the presence of contemporaneous correlations across cross-sectional units (here across countries). The null hypothesis of the Breusch-Pagan test is that of cross-sectional independence[7]. The test rejects the null hypothesis, hence there is spatial correlation in our data.

Second, a fixed effect model assumes homoskedasticity. The most likely deviation from homoskedastic errors in the context of pooled cross-section time-series data like ours is the presence of error variances specific to the cross-sectional unit. Hence, we calculate a modified Wald statistic for group-wise heteroskedasticity in the residuals of a fixed effect regression model[8]. The null hypothesis of homoskedasticity is strongly rejected.

Hence, the above tests suggest that we might not use the standard fixed effect procedure without taking into account spatial correlation and panel heteroskedasticity. Since *panel corrected standard errors* can be applied to the third stage of the *fixed effect vector decomposition* estimator, we systematically calculate them in the following. As a robustness check, though keeping in mind that we include an almost time-invariant variable in our regression along with unit country effect, we follow Beck and Katz (1995) and also run an OLS model with fixed effects and *panel corrected standard errors*[9].

2.4.2 Dynamic Issues

The PCSE procedure assumes that the disturbances are heteroskedastic and contemporaneously correlated across panels, but that there is no serial au-

[6]We use the *xttest2* Stata command, following Greene (2000).

[7]In the context of a slightly unbalanced panel like ours, the observations used to calculate the test statistic are those available for all cross-sectional units. Here, the number of available observations reported is 16.

[8]We use the *xttest3* Stata command, following Greene (2000).

[9]Importantly, the authors show the superiority of PCSE estimates over GLS estimates when T is not significantly higher than N. When T does not tend to infinity, as is the case in our dataset, the Park method (GLS estimate) yields standard errors that are too small -up to 600 percent- and therefore overconfident results. By contrast, so long as $T > 15$ (which is our case, since $T = 23$), Monte Carlo experiments show that PCSEs are considerably better than OLS standard errors when there is panel heteroskedasticity and contemporaneous correlation of the errors.

tocorrelation. To run PCSE estimates, therefore, we must get rid of serial autocorrelation. We test for it using the Wooldridge test for autocorrelation in panel data[10]. The test strongly rejects the null hypothesis of no first-order autocorrelation.

Hence, we have two options: (i) Treating the model as static or (ii) Explicitely using the dynamics.

(i) If we treat the model as static and the temporal correlation as a problem, we assume that the latter has no substantive interest. Then, we should estimate ρ and use this estimate to correct the errors[11]. This is the AR(1) error model:

$$y_{it} = \beta_1 f_{it} + \beta_2 p_{it} + \beta_{12} f_{it} p_{it} + \delta_t + \eta_i + \mu_{it} \tag{5}$$

where $\mu_{it} = \rho \mu_{it-1} + \nu_{it}$,
or equivalently $\mu_{it} = \rho y_{it-1} - \Sigma \beta_k \rho x_{kit-1} + \nu_{it}$

(ii) If we are interested in a dynamic specification of the model, we can explicitly include the lagged dependent variable (LDV) into the model:

$$y_{it} = \rho y_{it-1} + \beta_1 f_{it} + \beta_2 p_{it} + \beta_{12} f_{it} p_{it} + \delta_t + \eta_i + \mu_{it} \tag{6}$$

With such a specification, we should get rid of the error autocorrelation, since the lagged dependent variable includes lagged error term (Beck and Katz, 2004). Contrary to the AR(1) specification that assumes an immediate adjustment of the dependent variable, here we measure long-term effects or slow adjustment of the dependent variable to a change in the independent variables.

We have no *a priori* expectations on the speed of adjustment of our dependent variable. However, the *fixed effect vector decomposition* estimator can only take into account the AR(1) error process[12]. But the inclusion of a

[10] We use the *xtserial* Stata command, following Wooldridge (2002) and Drukker (2003).

[11] Using the *ar1* option in the *xtpcse* Stata command.

[12] Indeed, no correction is applied to the error of the second stage, while running an LDV model, though this second-stage error is to be used in the third stage OLS estimate. By opposition, the FEVD procedure has been designed to apply the AR(1) Cochrane-Orcutt transformation in the third stage. Not knowing the resulting bias in the LDV specification, we therefore only run the AR(1) model.

lagged dependent variable with fixed effects, be it implicit or explicit, raises new issues. Indeed, it induces a correlation between $\hat{y}$, the lagged dependent variable in terms of deviation from its mean ($\hat{y}_{it-1} = y_{it-1} - \frac{1}{T}\sum y_{it-1}$) and $\hat{\mu}$, the error term in terms of deviation from its mean ($\hat{\mu}_{it-1} = \mu_{it-1} - \frac{1}{T}\sum \mu_{it-1}$). Hence it leads to a biased estimate (Nickell, 1981).

To deal with this issue, many alternative estimators have been proposed in the econometric literature. However, all of them are specifically designed for panel data ($T < 10$ and N very large), not for TSCS data ($T > 20$ and $N < 30$)[13]. Adding a correlation between the unit effects and the exogenous variables, Beck and Katz (2004) produce Monte Carlo experiments for TSCS alike data. They aim to compare the performance of the LSDV estimator including a lagged dependent variable (like our dynamic specification), with the Anderson-Hsiao estimator and the Kiviet correction, as both T and ρ vary (the other parameters are fixed at a single value, with $N = 20$). The authors show clear evidence that there is a downward bias using the LSDV estimator, which dramatically decreases with T and slightly increases with ρ. Moreover, the authors give strong advice not to use the Anderson-Hsiao estimator for TSCS data, the cost of using it being very high in terms of root-mean square error (namely, the estimation variability is very high). Finally, they advise to use the LSDV estimator preferably to the Kiviet correction (which, in all cases, would not fit our unbalanced data), as long as $T > 20$. Consequently, when testing the dynamic specification of the model, we stay with our FEVD estimator, which has the enormous advantage to be able to estimate the coefficient of the slowly-changing variable of interest, namely the political demand.

2.4.3 Unit Roots

Finally, a last check should be done, which concerns the presence of unit roots (non-stationarity) in the data. Indeed, if our dependent variable is not stationary, then the introduction of a lagged dependent variable to model dynamics will lead to spurious regressions. Thus, we first run a test of the null that the data have no unit roots. To do it, we run a Fisher's test,

[13]For instance, the instrumental variables procedure suggested by Anderson and Hsiao (1982) might be at the cost of raising dramatically the mean squared error (Beck and Katz, 2004) ; GMM (Arellano and Bond, 1991) only works if N is very large ; Kiviet (1995) approach assumes the data are balanced, among other important issues that do not fit our data.

following Maddala and Wu (1999), which assumes that all series are non-stationary under the null hypothesis against the alternative that at least one series in the panel is stationary[14]. Results are in the Appendix. Moreover, after estimating the dynamic version of the model, we systematically check whether the residuals appear stationary (to do that, we run an autoregression of the residuals on their lags and check if the coefficient of the lagged residuals is close to one). Finally, we also run a series of autoregression for all our variables, thus examining the size of the coefficient of the lagged variables (Beck, 2006). We conclude that there is no unit root in our panel.

3 Data

In order to measure the economic policy that deals with income protection, we use a global index of generosity of the Welfare State, calculated by Scruggs (2004)[15]. This includes net replacement rates of unemployment benefits, sickness benefits and pension insurance, the extent of program coverage and duration -it is actually an extension of the decommodification index of Esping-Andersen (1990). The advantage of this index is that it gives a better idea of the willingness of the States to protect income that the ratio social expenditures over GDP, since it encompasses not only generosity scores, but also measures of access conditions.

The political demand is here defined as being the share of people who agree with government redistribution. More precisely, it is the share of individuals, in each country, who agree or strongly agree while answering to the following ISSP survey question: "What is your opinion of the following statement: It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes", that has been submitted in several years (Table 14). The heterogeneity of the political demand is hence defined as being the coefficient of variation of preferences for redistribution (Figures 2 to 7). We first calculate the standard deviation, for each survey year and each country, of answers to the previous question on redistribution ; we then divide the standard deviation by the

[14]We use the *xtfisher* Stata command that fits unbalanced data like ours, preferably to the test porposed by Im, Pesaran and Shin (2003) that requires a balanced panel.

[15]Scruggs' Overall Generosity Score is available on his website. See also Allan and Scruggs (2004).

country mean answer, in order to have a scale-free measure of dispersion[16].

Finally, the fractionalization of the party system is taken from Armingeon *et al.* (2004) and measured according to the formula of Rae (1967):

$$F = 1 - \sum_{i=1}^{m} t_i^2$$

with t_i the share of votes for party i and m the number of parties (Figure 8).

As for controls[17], we include in our regressions the government's ideological position in the left-right spectrum (continuous variable), weighted by votes, calculated by Amable, Gatti and Schumacher (2006) using information from Cusack and Engelhardt (2002) database. This database builds itself on the *Comparative Manifesto Project* (Budge *et al.*, 2001). Finally, the unemployment rate, standardized whenever possible (OECD), is used as an additional macroeconomic control, along with a measure of productivity (natural logarithm of GDP per employed worker in $t-1$, based on US dollars 2002, OECD).

Our time-series cross-section data set contains 18 OECD countries over 23 years. However, only 15 countries participated to the ISSP modules we are interested in to construct our demand variable. Indeed, Belgium and Finland did not participate, and data for Denmark are available only for the last wave (year 1999), on a non standardized separate data set. Hence, we did not include it in the analysis. Moreover, when dealing with the generosity score of the Welfare State constructed by Scruggs (2004), the data for Portugal and Spain are not available. Finally, we run the regressions for 13 countries over the time span 1980-2002.

4 Results

Since we are interested in the joint effect of (the fragmentation of) the demand with the fractionalization of the party system, we systematically intro-

[16] We could also take advantage of a measure of the asymmetry of the distribution of preferences by country, either proxied by the difference between the mean and the median divided by the standard deviation of the distribution (Pearson's skewness), or calculated with respect to the third moment about the mean (Fisher's skewness). However, since the distribution of preferences is systematically skewed to the right in our sample (mean > median), results are similar to those obtained using the mean level of preferences.

[17] We also checked for the inclusion of a measure of inflation and budget deficit, but these never turned out to be significant, so we do not include them in the final regressions.

duce an interaction term into our regressions. Thus, we seek to know to what extent the level of generosity of the Welfare State depends on the level (of the dispersion) of the expressed demand for redistribution and on the degree of atomicity of the political supply: we think that the impact of the demand should be positive and increase with the number of parties.

4.1 What Drives the Generosity of the Welfare State?

In Tables 1 to 3 that test the argument according to which the level of the demand for redistribution determines the generosity of the Welfare State, we find indeed that the marginal effect of the demand, always very significant, is positive and increases with the degree of fractionalization of political parties (Table 2). If taken in isolation, the impact of the fractionalization of the supply on the generosity of the State is positive, but becomes significant only when the demand for redistribution is above the mean (Table 3). These results imply two important things:

(i) The political demand is indeed conveyed to the political arena, since it has a direct impact on the level of generosity of the State, even when the fractionalization of the political supply is weak (in other words, democracy works well). In addition, the political demand and the fractionalization of parties are complementary.

(ii) The fractionalization of political parties has a positive impact on the Welfare State only to the extent that it exists a relatively high demand for redistribution. Hence, contrary to what has been found in the literature (Bawn and Rosenbluth, 2006), we do not find strong evidence of a direct impact of the fractionalization of parties on the size of the State.

As a robustness check, we also run OLS estimates with country fixed effects and *panel corrected standard errors*. In columns [1b], [2b] and [3b] of Table 2, we notice that almost all the effect of the demand has been captured by the country fixed effects. This is the reason why the marginal effect of the demand, though clearly increasing with the fractionalization of the party system, is merely significant and much less important in size in this second set of estimations. As for party fractionalization, its marginal effect does not change when we turn to the OLS specification, as expected[18].

4.2 How is the Heterogeneity of Preferences Conveyed by Party Fractionalization?

We now turn to the dispersion model. Here, we test the idea that the fragmentation of the political demand, measured by its coefficient of variation, has a positive impact on the generosity of the Welfare State. This impact is assumed to increase with the fractionalization of the party system. Tables 4 to 6 give the results of regressions. The marginal effect of the dispersion of the demand is indeed positive, increasing with Rae's index, and highly significant (Table 5): The generosity of the State is higher when the demand is spread out, and the fractionalization of parties help to convey the dispersion of this demand[19]. We add two important comments on the results:

(i) Results are robust to the choice of the estimation process (fixed effect vector decomposition or OLS with country dummies and panel corrected standard errors). Even if the unit fixed effect partly captures the impact of the demand when running an OLS with country dummies, the coefficient of the demand dispersion remains positive and significant.

(ii) The impact of the political demand on the generosity of the Welfare State increases very rapidly with the degree of the fractionalization of parties: it triples when the fractionalization varies from its minimum value to its maximum value.

Hence, the parallelism between heterogeneity of preferences and abundance of the political supply seems relevant.

Some comments on the control variables. First, we notice that the coefficient of the ideological position of governments never turns out to be significant. This would suggest that governments directly encompass the demand within their policy decision, and have themselves no preferred policy.

[18] The size of the coefficient is exactly the same, but the standard errors are gently higher, leaving the result unchanged.

[19] We notice here that the marginal effect of the demand, though a bit smaller, seems very robust to a change in estimation technique, although the slowly-changing variable is still captured by country fixed effects. In addition, the size of the effect of party fractionalization is very close to the one of the previous set of regressions.

But we could also assume that the partisan position of governments, due to a feedback effect, is already captured by the term which expresses individual preferences. Concerning the macroeconomic controls, we notice the non-significance of the labour productivity in our regressions. However, the unemployment rate seems to act negatively on the index of generosity of the Welfare State. We interpret this as a downward adjustment of the benefits to an increase in the number of beneficiaries (e.g. increase in the number of unemployed).

4.3 Speed of Adjustment of the Generosity of the Welfare State

Following our descriptive statistics, we suspect some path dependency regarding the overall level of generosity of the Welfare State (Figure 9). We thus apply the dynamic specifications defined in equations 5 and 6, in order to evaluate the speed of adjustment of the generosity of the Welfare State.

Tables 7 and 10 give the results of the estimates. We notice the non trivial values of ρ, which confirms the existence of an adjustment mechanism of the Welfare State generosity of each country towards its long term value. Moreover, we continue to capture the complementarity between the political demand and the fractionalization of parties (Tables 8 and 11): The more the fractionalization of the party system is important, the more the demand for redistribution (or its fragmentation) is conveyed to the policy implemented by the government. The marginal effects of the demand are very comparable to the ones obtained in the static specifications of the model discussed above[20].

5 Conclusion

This paper proposes an empirical analysis of the interaction between the demand for redistribution expressed by individuals and the structure of the political supply. Hence, conflictual demands of heterogeneous agents can find a way to be expressed in public policies, according to the design of the political mediation. The latter partly depends on political institutions, namely election rules and the structure of the political supply. This implies that the matching of the supply to the political demand determines the nature

[20]To the contrary, the marginal effects of party fractionalization are much smaller and even less significant in the dynamic model than in the static one.

of the Welfare State, specifically the level of redistribution. We thus expect the structure of the party system to impact the generosity of the State, while allowing or not heterogeneous demands for redistribution to be taken into account. In particular, a more fractionalized party system will raise the representativity of elected bodies and enhance the reflection of political demand that comes from lower and middle class. Consequently, the higher the fractionalization of the party system, the better reflected the demand for redistribution into social policy outcomes.

The empirical literature on the subject only tests the influence of the supply on the nature of public expenditures, be it in level or in composition (Iversen, 2005 ; Persson and Tabellini, 1999). The originality of this paper is then to take into account the interaction between the demand for redistribution and the structure of the political supply to explain the level of generosity of the Welfare State and its variation within countries. Econometric regressions are done using time-series cross-section data, on a sample of 18 OECD countries spanned over the period 1980-2002. The data originates from both microeconomic databases (preferences for redistribution) and macroeconomic databases (policy outcome, party fractionalization). Results clearly show that the demand for redistribution leads to a more generous Welfare State, the more the party system is fractionalized (the higher the number of parties in Parliament). This is robust to a large variety of econometric specifications.

Yet, as Shepsle and Weingast (1984) put it: "Each of the above conclusions depends upon a rather special sort of preference revelation. Individual agents are assumed to be *sincere* revealers of their preferences so that the majority preference relation (built up from sincerely revealed individual preferences) may be taken as descriptive of the voting behaviour of majorities." (p.50). This is a strong, though necessary, assumption that we have done in this study.

References

[1] Allan, J. and L. Scruggs (2004) "Political Partisanship and Welfare State Reform in Advanced Industrial Societies", *American Journal of Political Science*, 48(3): 493-512

[2] Amable, B. and D. Gatti (2007) "The Political Economy of Job Protection and Income Redistribution", mimeo

[3] Amable, B., D. Gatti and E. Guillaud (2008) "Générosité de l'Etat social : l'interaction entre la demande de redistribution et la fractionnalisation des partis", mimeo PSE

[4] Amable, B., D. Gatti and J. Schumacher (2006) "Welfare-State Retrenchment: The Partisan Effect Revisited", *Oxford Review of Economic Policy*, 22(3): 426-444

[5] Anderson, T.W. and C. Hsiao (1982) "Formulation and Estimation of Dynamic Models Using Panel Data", *Journal of Econometrics*, 18(1): 47-82

[6] Arellano and Bond (1991) "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58(2): 277-297

[7] Armingeon, K., M. Gerber, P. Leimgruber, M. Beyeler and S. Menegale (2004) "Comparative Political Data Set 1960-2002", Institute of Political Science, University of Berne

[8] Bawn, K. and F. Rosenbluth (2006) "Short versus Long Coalitions: Electoral Accountability and the Size of the Public Sector", *American Journal of Political Science*, 50(2): 251-265

[9] Beck (2006) "Time-Series-Cross-Section Methods", draft, New York University

[10] Beck, N. and J.N. Katz (1995) "What to do (and not to do) with Time-Series Cross-Section Data", *American Political Science Review*, 89(3): 634-647

[11] Beck, N. and J.N. Katz (1996) "Nuisance vs. Substance: Specifying and Estimating Time-Series-Cross-Section Models", *Political Analysis*, 6(1): 1-36

[12] Beck, N. and J.N. Katz (2004) "Time-Series-Cross-Section Issues: Dynamics, 2004", draft, New York University and California Institute of Technology

[13] Braumoeller, B.F. (2004) "Hypothesis Testing and Multiplicative Interaction Terms", *International Organization*, 58(4): 807-820

[14] Budge, I., H.-D. Klingemann, A. Volkens, J. Bara and E. Tanabaum (2001) *Mapping Policy Preferences: Estimates for Parties, Electors, and Governments, 1945-1998*, Oxford: Oxford University Press

[15] Cox, G. (1990) "Centripetal and Centrifugal Forces in Electoral Systems", *American Journal of Political Science*, 34(4): 903-935

[16] Crepaz, M.M.L. (1998) "Inclusion versus Exclusion: Political Institutions and Welfare Expenditures", *Comparative Politics*, 31(1): 61-80

[17] Cusack, T.R. and L. Engelhardt (2002) "The PGL File Collection", WZB

[18] Drukker, D.M. (2003) "Testing for Serial Correlation in Linear Panel-data Models", *Stata Journal*, (3)2: 168-177

[19] Esping-Andersen, G. (1990) *The Three Worlds of Welfare Capitalism*, Princeton: Princeton University Press

[20] Friedrich, R.J. (1982) "In Defense of Multiplicative Terms in Multiple Regression Equations", *American Journal of Political Science*, 26(4): 797-833

[21] Greene, W. (2000) *Econometric Analysis*, Upper Saddle River, NJ: Prentice-Hall

[22] Grofman, B. (2006) "The Impact of Electoral Laws on Political Parties", *in* Weingast, B. and D. Wittman (Eds) *Handbook of Political Economy*, Oxford: Oxford University Press

[23] Huber, E., C. Ragin, J.D. Stephens, D. Brady and J. Beckfield (2004) "Comparative Welfare States Data Set", Northwestern University, University of North Carolina, Duke University and Indiana University

[24] Im, K.S., M.H. Pesaran and Y. Shin (2003) "Testing for Unit Roots in Heterogeneous Panels", *Journal of Econometrics*, 115(1): 53-74

[25] Iversen, T. (2005) *Capitalism, Democracy, and Welfare*, Cambridge: Cambridge University Press

[26] Kiviet, J.F. (1995) "On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Models", *Journal of Econometrics*, 68(1): 53-78

[27] Kmenta, J. (1967) "On Estimation of the CES Production Function", *International Economic Review*, 8(2): 180-189

[28] Korpi, W. and J. Palme (2003) "New Politics and Class Politics in the Context of Austerity and Globalization: Welfare State Regress in 18 Countries, 1975-95", *American Political Science Review*, 97(3): 425-446

[29] Laver, M. and N. Schofield (1990) *Multiparty Government: The Politics of Coalition in Europe*, Oxford: Oxford University Press

[30] Lijphart, A. (1994) *Electoral Systems and Party Systems: A Study of Twenty-Seven Democracies, 1945-1990*, Oxford: Oxford University Press

[31] Lijphart, A. (1999) *Patterns of Democracy*, New Haven: Yale University Press

[32] Maddala, G.S. and S. Wu (1999) "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test", *Oxford Bulletin of Economics and Statistics*, 61(0): 631-652

[33] Milesi-Ferretti G.-M., R. Perotti and M. Rostagno (2002) "Electoral Systems and the Composition of Public Spending", *Quarterly Journal of Economics*, 117(2): 609-657

[34] Mullahy, J. (1999) "Interaction Effects and Difference-in-Difference Estimation in Loglinear Models", NBER Technical Working Paper 245

[35] Nickell, S. (1981) "Biases in Dynamic Models with Fixed Effects", *Econometrica*, 49(6): 1417-1426

[36] Pagano, M. and P. Volpin (2001) "The Political Economy of Finance", *Oxford Review of Economic Policy*, 17(4): 502-519

[37] Pagano, M. and P. Volpin (2005) "The Political Economy of Corporate Governance", *American Economic Review*, 95(4): 1005-1030

[38] Persson, T., G. Roland and G. Tabellini (2007) "Electoral Rules and Government Spending in Parliamentary Democracies", *Quarterly Journal of Political Science*, 2(2): 155-188

[39] Persson, T. and G. Tabellini (1999) "The Size and Scope of Government: Comparative Politics with Rational Politicians", *European Economic Review* 43(4-6): 699-735

[40] Plümper, T. and V.E. Troeger (2007) "Efficient Estimation of Time-Invariant and Rarely Changing Variables in Finite Sample Panel Analyses with Unit Fixed Effects", *Political Analysis*, 15(2): 124-139

[41] Rae, D. (1967) *The Political Consequences of Electoral Laws*, New Haven: Yale University Press

[42] Shepsle, K.A. and B.R. Weingast (1984) "Uncovered Sets and Sophisticated Voting Outcomes with Implications for Agenda Institutions", *American Journal of Political Science*, 28(1): 49-74

[43] Scruggs, L. (2004) "Welfare State Entitlements Data Set: A Comparative Institutional Analysis of Eighteen Welfare States", Version 1.2

[44] Tabellini, G. (2000) "A Positive Theory of Social Security", *Scandinavian Journal of Economics*, 102(3): 523-545

[45] Weingast, B.R., K.A. Shepsle and C. Johnsen (1981) "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics", *Journal of Political Economy*, 89(4): 642-664

[46] Wooldridge, J.M. (2002) *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press

A Static models of Welfare State generosity

Table 1: Welfare State generosity

	[1]	**[1b]**	**[2]**	**[2b]**	**[3]**	**[3b]**
party fract.	-0.033	-0.033	0.019	0.019		
	(0.053)	(0.113)	(0.043)	(0.103)		
dem. redist. x fract.	0.002***	0.002	0.001*	0.001		
	(0.000)	(0.002)	(0.000)	(0.002)		
demand for redist.	0.072***	-0.175	0.167***	-0.042		
	(0.006)	(0.117)	(0.006)	(0.118)		
unempl. rate			-0.237***	-0.237***		
			(0.062)	(0.062)		
gov. partisanship			0.001	0.001		
			(0.007)	(0.007)		
productivity (-1)			-1.350	-1.350	-0.050	-0.050
			(2.319)	(2.340)	(0.108)	(0.105)
ln[fract.]					-0.819***	-0.819
					(0.124)	(0.791)
ln[dem. redist.] X ln[fract.]					0.236***	0.236
					(0.016)	(0.195)
ln[dem. redist.]					-0.490***	-0.957
					(0.011)	(0.821)
ln[unempl.]					-0.027**	-0.027**
					(0.012)	(0.011)
ln[gov. partis.]					-0.007	-0.007
					(0.013)	(0.012)
Estimator	fevd	ols	fevd	ols	fevd	ols
Year dummies	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes
Number of obs	299	299	266	266	266	266
R-squared	0.958	0.958	0.972	0.972	0.968	0.968

Note: Models 3 and 3b are log models. Panel corrected standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 2: Marginal effect of the demand for redistribution

	[1]	**[1b]**	**[2]**	**[2b]**	**[3]**	**[3b]**
min	0.167***	-0.080**	0.202***	-0.006	0.435***	-0.032
	(0.024)	(0.039)	(0.020)	(0.040)	(0.061)	(0.084)
mean_less_1sd	0.192***	-0.055*	0.211***	0.003	0.488***	0.021
	(0.030)	(0.029)	(0.025)	(0.027)	(0.065)	(0.064)
mean	0.208***	-0.039	0.217***	0.009	0.517***	0.050
	(0.034)	(0.031)	(0.028)	(0.026)	(0.067)	(0.064)
mean_plus_1sd	0.224***	-0.023	0.223***	0.014	0.546***	0.079
	(0.038)	(0.039)	(0.032)	(0.032)	(0.069)	(0.072)
max	0.237***	-0.010	0.228***	0.020	0.565***	0.098
	(0.042)	(0.048)	(0.035)	(0.041)	(0.070)	(0.081)

Note: Models 3 and 3b are log models. Standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 3: Marginal effect of the fractionalization of parties

	[1]	**[1b]**	**[2]**	**[2b]**	**[3]**	**[3b]**
min	0.023	0.023	0.040	0.040	-0.019	-0.019
	(0.045)	(0.067)	(0.039)	(0.058)	(0.103)	(0.159)
mean_less_1sd	0.054	0.054	0.051	0.051	0.079	0.079
	(0.043)	(0.046)	(0.038)	(0.040)	(0.103)	(0.108)
mean	0.076*	0.076*	0.059	0.059*	0.132	0.132
	(0.042)	(0.039)	(0.038)	(0.035)	(0.102)	(0.098)
mean_plus_1sd	0.098**	0.098**	0.067*	0.067*	0.185*	0.185*
	(0.041)	(0.041)	(0.038)	(0.041)	(0.102)	(0.107)
max	0.122***	0.122**	0.077*	0.077	0.222**	0.222*
	(0.042)	(0.053)	(0.040)	(0.055)	(0.102)	(0.122)

Note: Models 3 and 3b are log models. Standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 4: Welfare State generosity (dispersion of preferences)

	[4]	**[4b]**	**[5]**	**[5b]**	**[6]**	**[6b]**
party fract.	0.020	0.020	-0.130***	-0.130		
	(0.052)	(0.179)	(0.049)	(0.164)		
disp. redist. x fract.	0.001**	0.001	0.004***	0.004		
	(0.001)	(0.003)	(0.001)	(0.003)		
disp. demand for redist.	0.012	-0.020	-0.109***	-0.113		
	(0.011)	(0.226)	(0.009)	(0.205)		
unempl. rate			-0.284***	-0.284***		
			(0.065)	(0.063)		
gov. partisanship			0.001	0.001		
			(0.007)	(0.007)		
productivity (-1)			-2.406	-2.406	-0.068	-0.068
			(2.435)	(2.435)	(0.117)	(0.113)
ln[fract.]					-1.729***	-1.729
					(0.121)	(1.738)
ln[disp. redist.] x ln[fract.]					0.484***	0.484
					(0.022)	(0.446)
ln[disp. redist.]					-1.633***	-1.799
					(0.017)	(1.851)
ln[unempl.]					-0.032***	-0.032***
					(0.012)	(0.011)
ln[gov. partis.]					-0.007	-0.007
					(0.013)	(0.012)
Estimator	fevd	ols	fevd	ols	fevd	ols
Year dummies	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes
Number of obs	299	299	266	266	266	266
R-squared	0.958	0.958	0.973	0.973	0.969	0.969

Note: Models 6 and 6b are log models. Panel corrected standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 5: Marginal effect of the dispersion of preferences

	[4]	**[4b]**	**[5]**	**[5b]**	**[6]**	**[6b]**
min	0.086***	0.054	0.089***	0.085	0.260***	0.094
	(0.030)	(0.077)	(0.031)	(0.059)	(0.083)	(0.126)
mean_less_1sd	0.105***	0.073	0.140***	0.136***	0.368***	0.202***
	(0.037)	(0.047)	(0.039)	(0.035)	(0.088)	(0.069)
mean	0.117***	0.085**	0.173***	0.169***	0.428***	0.262***
	(0.042)	(0.041)	(0.044)	(0.039)	(0.091)	(0.085)
mean_plus_1sd	0.129***	0.098**	0.206***	0.202***	0.487***	0.322**
	(0.047)	(0.049)	(0.050)	(0.055)	(0.094)	(0.125)
max	0.140***	0.108*	0.235***	0.231***	0.526***	0.361**
	(0.051)	(0.064)	(0.054)	(0.074)	(0.095)	(0.156)

Note: Models 6 and 6b are log models. Standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 6: Marginal effect of the fractionalization of parties

	[4]	**[4b]**	**[5]**	**[5b]**	**[6]**	**[6b]**
min	0.073*	0.073	0.011	0.011	-0.000	-0.000
	(0.042)	(0.073)	(0.039)	(0.062)	(0.106)	(0.174)
mean_less_1sd	0.082**	0.082	0.037	0.037	0.085	0.085
	(0.042)	(0.057)	(0.039)	(0.047)	(0.107)	(0.119)
mean	0.091**	0.091**	0.060	0.060	0.140	0.140
	(0.042)	(0.045)	(0.039)	(0.038)	(0.108)	(0.101)
mean_plus_1sd	0.099**	0.099**	0.082**	0.082**	0.196*	0.196*
	(0.042)	(0.039)	(0.039)	(0.036)	(0.108)	(0.107)
max	0.113***	0.113**	0.121***	0.121**	0.279**	0.279*
	(0.042)	(0.046)	(0.040)	(0.051)	(0.109)	(0.152)

Note: Models 6 and 6b are log models. Standard errors in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

B Dynamics with AR1 process

Table 7: Welfare State generosity: AR1 error process

	[7]	**[8]**	**[9]**
demand for redist.	0.168***	0.150***	
	(0.006)	(0.005)	
party fract.	-0.055	-0.064*	
	(0.051)	(0.038)	
dem. redist. x fract.	0.001**	0.001***	
	(0.000)	(0.000)	
unempl. rate		-0.132**	
		(0.059)	
gov. partisanship		0.001	
		(0.007)	
productivity (-1)		-0.503	-0.051
		(1.990)	(0.102)
ln[dem. redist.]			-0.269***
			(0.010)
ln[fract.]			-0.749***
			(0.112)
ln[dem. redist.] x ln[fract.]			0.196***
			(0.015)
ln[unempl.]			-0.026**
			(0.011)
ln[gov. partis.]			0.001
			(0.014)
Estimator	fevd	fevd	fevd
Dynamics	ar1	ar1	ar1
ρ	0.860	0.808	0.747
Year dummies	yes	yes	yes
Country dummies	yes	yes	yes
Number of Obs	286	252	252
R-Squared	0.937	0.964	0.964

Note: Model 9 is a log model. Panel corrected standard errors in parentheses. Estimator fevd, stage 3: AR1 Cochrane-Orcutt transformation (serial correlation of the error term). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 8: Marginal effect of demand (AR1)

	[7]	**[8]**	**[9]**
min	0.220***	0.218***	0.497***
	(0.023)	(0.019)	(0.055)
mean_less_1sd	0.234***	0.236***	0.541***
	(0.030)	(0.023)	(0.058)
mean	0.243***	0.247***	0.565***
	(0.034)	(0.027)	(0.060)
mean_plus_1sd	0.252***	0.258***	0.589***
	(0.038)	(0.030)	(0.062)
max	0.259***	0.268***	0.605***
	(0.041)	(0.033)	(0.063)

Note: Model 9 is a log model. Standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 9: Marginal effect of fractionalization (AR1)

	[7]	**[8]**	**[9]**
min	-0.024	-0.024	-0.087
	(0.043)	(0.035)	(0.101)
mean_less_1sd	-0.006	-0.003	-0.006
	(0.040)	(0.035)	(0.101)
mean	0.006	0.013	0.038
	(0.038)	(0.035)	(0.101)
mean_plus_1sd	0.018	0.029	0.082
	(0.038)	(0.036)	(0.102)
max	0.032	0.046	0.113
	(0.039)	(0.038)	(0.102)

Note: Model 9 is a log model. Standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 10: WS generosity: AR1 error process (dispersion of pref.)

	[10]	**[11]**	**[12]**
disp. dem. for redist.	-0.145***	-0.203***	
	(0.011)	(0.009)	
party fract.	-0.225***	-0.277***	
	(0.049)	(0.047)	
disp. redist. x fract.	0.005***	0.006***	
	(0.001)	(0.001)	
unempl. rate		-0.147**	
		(0.061)	
gov. partisanship		0.000	
		(0.007)	
productivity (-1)		-0.091	-0.028
		(2.210)	(0.114)
ln[disp. redist.]			-1.075***
			(0.016)
ln[fract.]			-1.456***
			(0.118)
ln[disp. redist.] x ln[fract.]			0.379***
			(0.021)
ln[unempl.]			-0.026**
			(0.011)
ln[gov. partis.]			0.003
			(0.013)
Estimator	fevd	fevd	fevd
Dynamics	ar1	ar1	ar1
ρ	0.857	0.792	0.731
Year dummies	yes	yes	yes
Country dummies	yes	yes	yes
Number of Obs	286	252	252
R-Squared	0.939	0.967	0.966

Note: Model 12 is a log model. Panel corrected standard errors in parentheses. Estimator fevd, stage 3: AR1 Cochrane-Orcutt transformation (serial correlation of the error term). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 11: Marginal effect of demand dispersion (AR1)

	[10]	**[11]**	**[12]**
min	0.088***	0.090***	0.408***
	(0.029)	(0.030)	(0.078)
mean_less_1sd	0.151***	0.167***	0.494***
	(0.037)	(0.038)	(0.083)
mean	0.189***	0.215***	0.540***
	(0.041)	(0.043)	(0.085)
mean_plus_1sd	0.228***	0.263***	0.587***
	(0.046)	(0.048)	(0.088)
max	0.259***	0.305***	0.617***
	(0.050)	(0.052)	(0.089)

Note: Model 12 is a log model. Standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 12: Marginal effect of fractionalization (AR1)

	[10]	**[11]**	**[12]**
min	-0.059	-0.069*	-0.102
	(0.040)	(0.037)	(0.103)
mean_less_1sd	-0.029	-0.030	-0.036
	(0.039)	(0.036)	(0.104)
mean	-0.002	0.003	0.008
	(0.039)	(0.036)	(0.104)
mean_plus_1sd	0.025	0.037	0.051
	(0.039)	(0.036)	(0.105)
max	0.070*	0.094**	0.116
	(0.040)	(0.037)	(0.106)

Note: Model 12 is a log model. Standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

C Descriptive Statistics

Table 13: Summary statistics

Variable	Mean	SD between	SD within	Min	Max	N	n	T
WS generosity	28.551	7.597	1.654	17.417	45.378	368	16	23
demand for redist.	61.007	14.354	3.039	29.47	90.430	345	15	23
disp. dem. redist.	48.775	6.065	1.793	35.665	63.481	345	15	23
party fract.	73.518	8.255	3.504	50.099	90.325	414	18	23
unempl. rate	7.518	2.911	2.177	1.6	19.5	414	18	23
gov. partisanship	53.392	12.106	13.155	0.587	93.291	377	18	21
productivity	10.861	0.152	0.124	10.187	11.243	414	18	23

Table 14: ISSP survey

Waves	1985	1987	1990	1992	1996	1999
Australia	yes	yes	yes	yes	yes	yes
Austria	yes	yes		yes		yes
Canada				yes	yes	yes
France					yes	yes
Germany	yes	yes	yes	yes	yes	yes
Ireland			yes		yes	
Italy	yes	yes	yes	yes	yes	
Japan					yes	yes
Netherlands		yes				
Norway			yes	yes	yes	yes
Portugal						yes
Spain					yes	yes
Sweden				yes	yes	yes
United Kingdom	yes	yes	yes	yes	yes	yes
USA	yes	yes	yes	yes	yes	yes

Note: Belgium and Finland did not participate to any of the above waves. Data for Denmark are available for the last wave (1999) on a non standardized separate data set. We did not use it for this study.

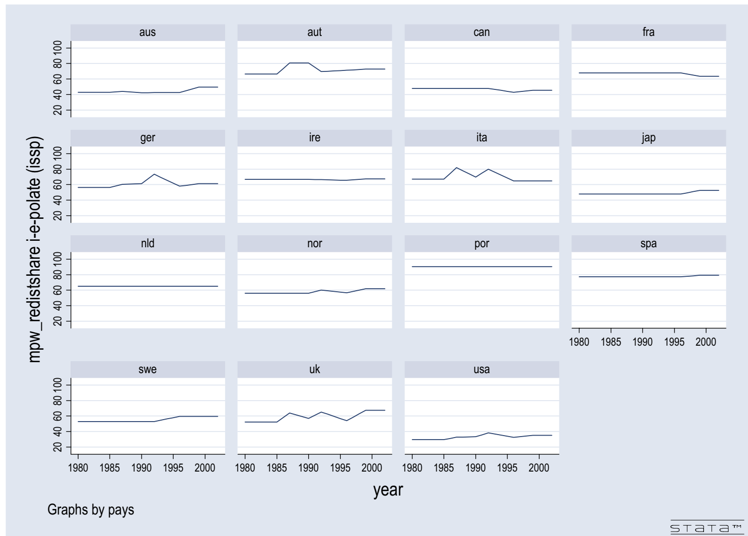

Figure 1: demand for redistribution, by country

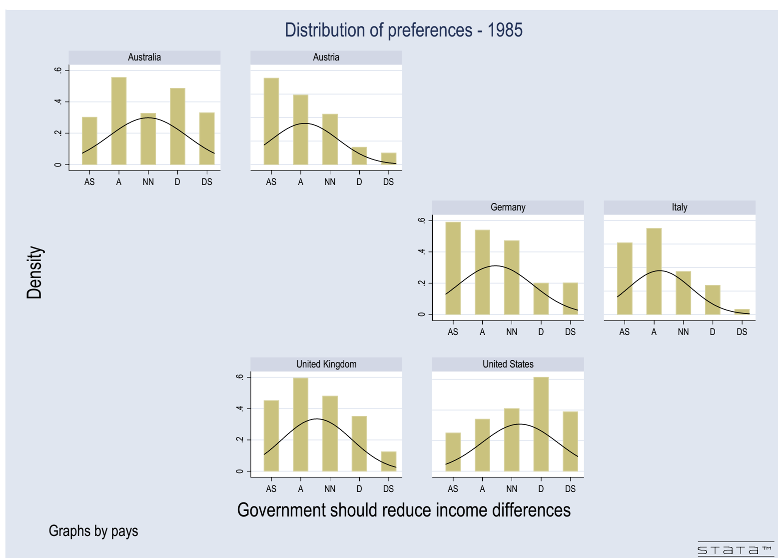

Figure 2: distribution of preferences for redistribution

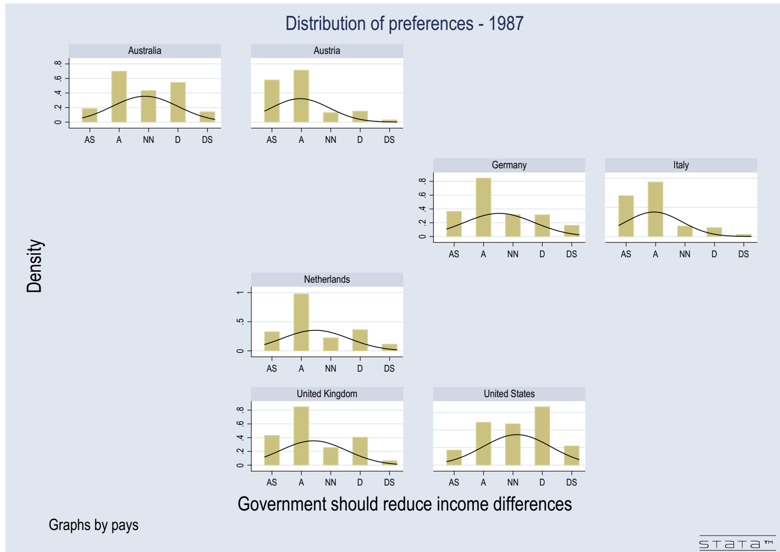

Figure 3: distribution of preferences for redistribution

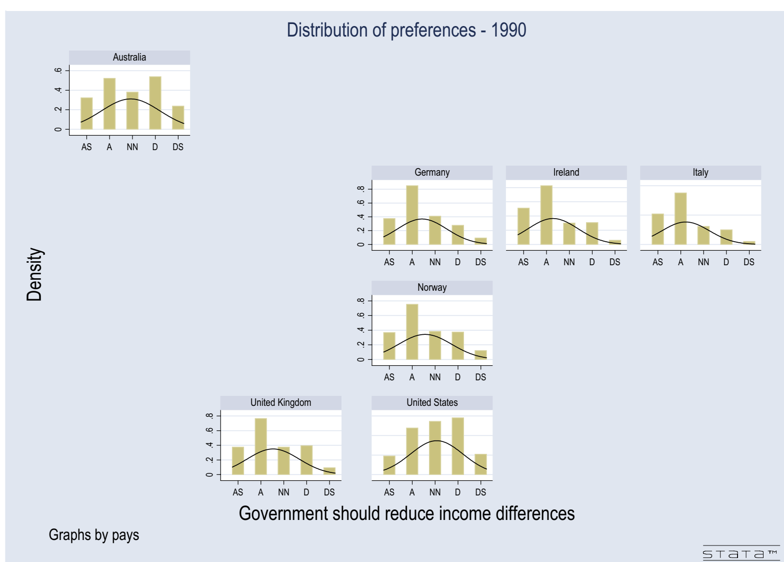

Figure 4: distribution of preferences for redistribution

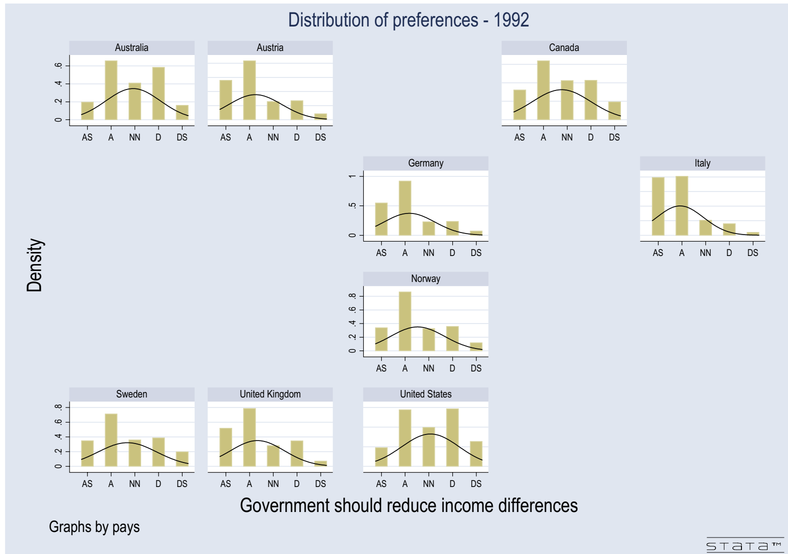

Figure 5: distribution of preferences for redistribution

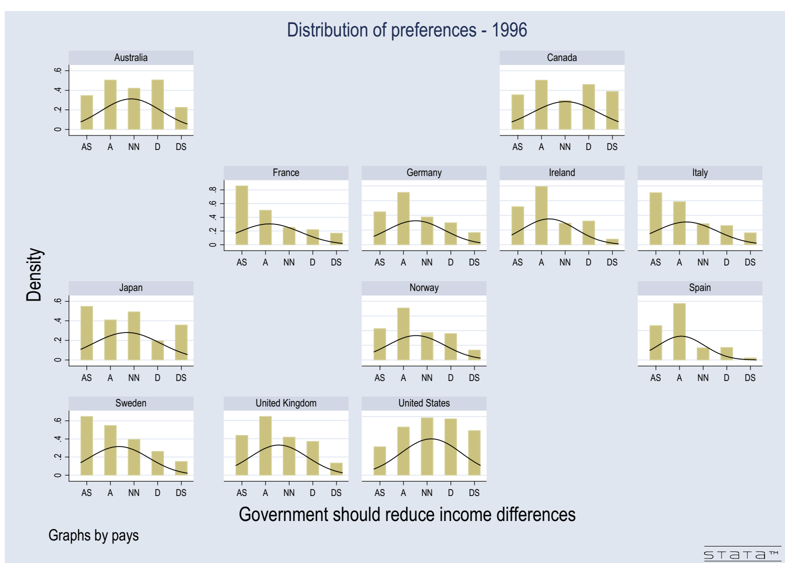

Figure 6: distribution of preferences for redistribution

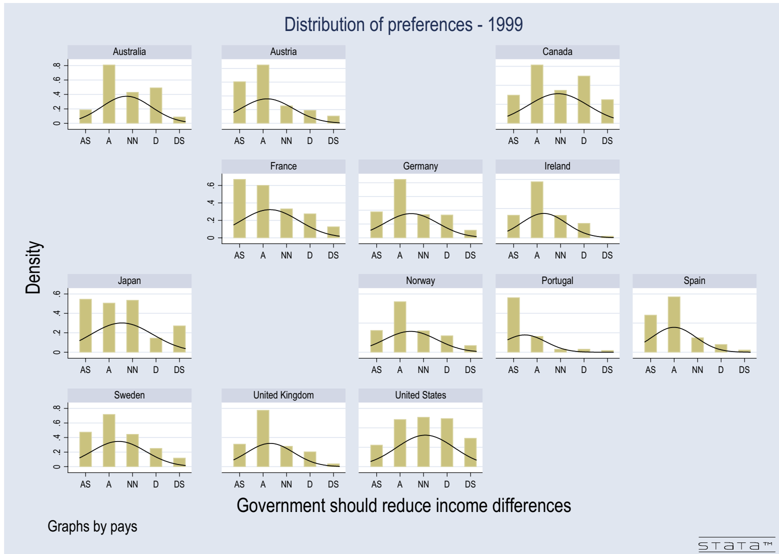

Figure 7: distribution of preferences for redistribution

Figure 8: party fractionalization, by country

Figure 9: Welfare State generosity, by country

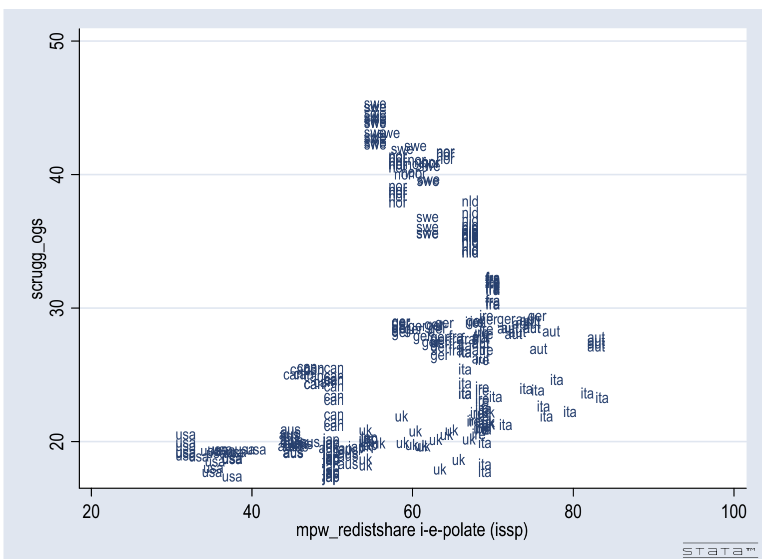

Figure 10: WS generosity and demand for redistribution (corr 0.3377)

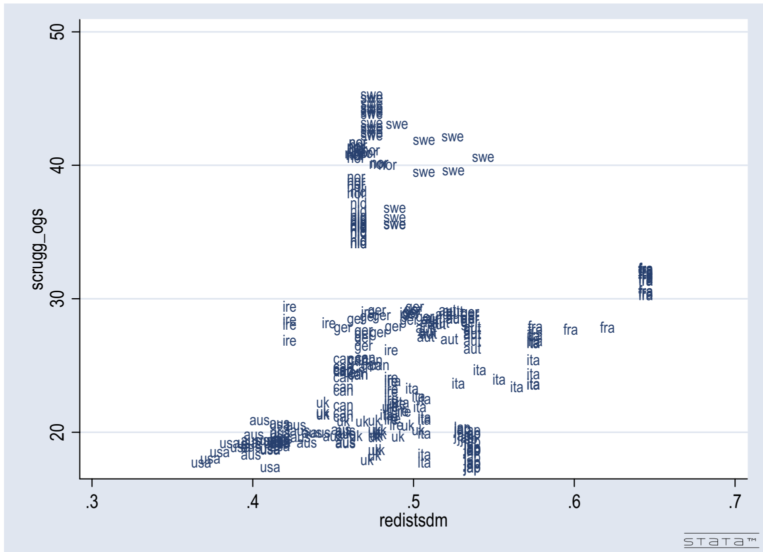

Figure 11: WS generosity and dispersion of the demand (corr 0.1396)

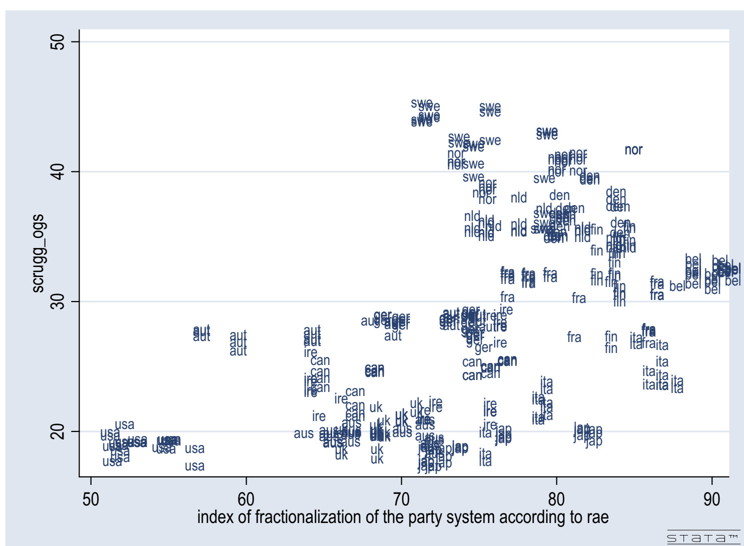

Figure 12: WS generosity and party fractionalization (corr 0.5057)

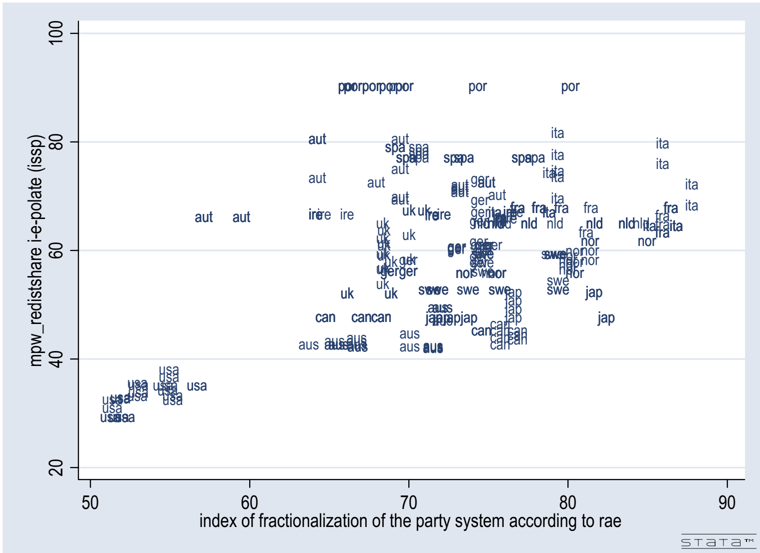

Figure 13: demand for redistribution and party fractionalization (corr 0.3633)

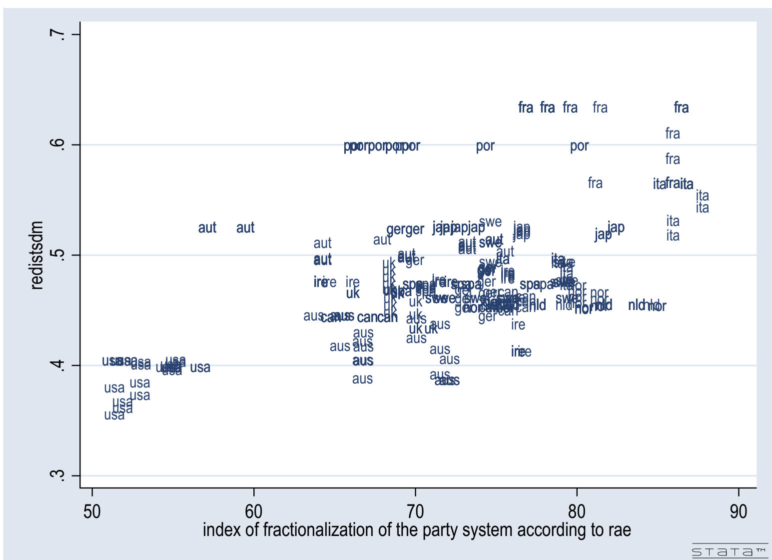

Figure 14: dispersion of the demand and party fractionalization (corr 0.4055)