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HETEROGENEITY IN INDIVIDUAL PREFERENCES FOR PUBLIC EXPENDITURE: WHAT SUGGESTIONS FOR THE ASSIGNMENT OF COMPETENCIES TO THE EU?

CARLO MAZZAFERRO, ALBERTO ZANARDI

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Heterogeneity in individual preferences for public expenditure: what suggestions for the assignment of competencies to the EU?

Carlo Mazzaferro – University of Bologna and Capp
Alberto Zanardi – University of Bologna and Econpubblica-Università Bocconi

VERY PRELIMINARY VERSION

Abstract

Building on the principles of the classical theory of fiscal federalism, the new political economy of multi-level government indicates a number of criteria as a guide for the efficient assignment of competencies between the European Union (EU) and the member states: internalize interregional spillovers; exploit economies of scale; take into account heterogeneity of preferences. The aim of this paper is to compare the welfare effects that the heterogeneity of individual preferences for public expenditures imply with the centralized and the decentralized solutions. In this perspective a median voter mechanism of collective decision is assumed to work both at national and EU level. Using data from a large international survey (ISSP), a series of econometric models has been estimated in order to make individual attitudes for public expenditures representative and comparable across different categories and different countries. A measurement of the individual and total welfare loss has then been derived in the cases when the decision upon the level of public provision is taken by the national or by the median EU voter respectively. The empirical analysis reveals that in some sectors of public expenditure (health, education, employment benefits) centralized solution welfare dominates (or is close to dominating) decentralization even in the absence of economies of scale and interregional spillovers.

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Corresponding author: Alberto Zanardi, Dipartimento di Scienze Economiche, Università di Bologna, email: zanardi@economia.unibo.it

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1. *Introduction*

The question of the optimal assignment of competencies between the European Union (EU) and member states has been one of the central arguments in the economic and political debate during the approval of the European Constitution. EU intervention is already quite extensive in a certain number of tasks: monetary policy, internal market regulation, agriculture, common trade policy. Other fields of public intervention (competition, regional policies, employment and social policies, enterprise policies, equal opportunities, industrial policies, consumer policies, environment, research and technology, transportation, information and telecommunication, energy) represent cases of shared responsibility between the EU and national governments. Lastly, some sectors of public expenditure, namely health, assistance, education, cultural policy, are typically allocated at national or even subnational level.

The optimal balance of power between the EU and national states is far from being clearly defined either in practice or from a theoretical point of view. An important explanation of the current situation may be found in the different speeds at which political and economic convergence occurs across countries: "Europe's fundamental problem is that economic integration has preceded the construction of the relevant political institution" (Berglof et al. 2003). The EU has already many characteristics of a single market, especially in the case of goods and services, but political institutions summoned to regulate markets and to supply public goods are still missing. As a consequence, there is disagreement over which areas of policy making should be transferred to European institutions and also on how much power a European political institution should have in each area (Persson, Roland and Tabellini 1996).

Economists rely on the theory of fiscal federalism when seeking a solution for the optimal assignment of public functions among the EU and national governments. The dispersion of preferences across and inside jurisdictions is an important issue of this theory. The central aim of this paper is to compare the welfare effects that the heterogeneity of individual preferences for public expenditures imply with the centralized and the decentralized solutions when a median voter mechanism of collective decision is assumed to work at both national and the EU levels.

The paper is organized as follows. Section 2 briefly reviews the issue of optimal assignment of political tasks to different levels of government and the solution proposed by the fiscal federalism theory. Section 3 focuses on the role of individual preferences on public expenditures in the assignment of competencies between the EU and national states. Section 4 is the core of our empirical application: data from a large international survey (ISSP) are used to estimate a series of econometric models in order to make individual attitudes for public expenditures representative and comparable across different categories and different countries. In Section 5 a measurement of the individual and total welfare loss is derived in the cases when the decision upon the level of public provision is respectively taken by the national or by the median European voter and, on this basis, the sectors of

public expenditure where the centralized solution welfare dominate decentralization (or the opposite occurs) are identified. Section 6 concludes.

2 *The classical and the new theory of fiscal federalism: what do they suggest about the assignment problem between EU and national states?*

Within the dibate on the assignment of public functions to EU and national countries economists have built most of their conclusions on principles of the classical theory of fiscal federalism (Oates 1972). The theory states that redistributive and stabilization functions are more efficiently assigned to central government. The normative prescription on allocative functions is more mixed: public goods that provide services to the whole population should be allocated to central government, while decentralized governments should supply goods whose beneficial effects are locally limited. The advantage of the decentralization lies in the ability of local governments to tailor the level of local public goods to preferences of populations, which may be differentiated across regions. This very general principle allows different interpretations about the optimal degree of decentralization of public functions in a country: a public good may be defined as local, according to the dimension of the geographical area over which it exerts some positive effects and this area may change across time and space. However, the principle clearly affirms that public output should be provided "at the lowest level of government encompassing, in a spatial sense, the relevant benefits and costs" (Oates 1999). In other words, the theory claims that public goods whose effect are locally limited are always supplied by a local government at least as efficiently as by the central government. The dimension of the welfare gain from decentralization depends, other things being equal, on the informational advantage of local governments on citizens' preferences.

Oates's decentralization theorem has been applied in the debate on the optimal allocation of public functions between the EU and national states. Currently, the widespread use of the principle of subsidiarity in all European treaties witnesses the importance of the decentralization principle in the procedure of assignment of functions between the EU and national states, at least at an institutional level. Accordingly from a theoretical point of view the assignment of public policies should be made after the costs and benefits expected from the centralization/decentralization have been traded-off (Alesina and Spolaore 1997, Alesina, Angeloni and Schucknecht 2002, Buti and Nava 2003; Breuss and Eller 2003). In particular, the optimal assignment of public functions between the EU and national governments should consider welfare gains and losses expected from externalities, economies of scale and heterogeneity of preferences. We will briefly rehearse some important topics on these issues:

i) *externalities in the supply of goods and services.* The idea is that a centralised solution could prevent free riding and under- (over-) supply of goods which emerge if the positive effect of public programmes (the burden of tax financing of public spending) falls on

economic agents other than those financing them (those benefit from expenditure programmes).

ii) *economies of scale*. If unitary costs of production are declining a centralized solution increases the efficiency of the unitary supply.

iii) *heterogeneity of preferences*. When preferences between jurisdictions are heterogeneous, a decentralized provision of public goods is superior with respect to a uniform supply at the central level.

iv) *information about citizens' preferences*. Decentralization may offer an advantage in order to tailor adequately the level of expenditure to citizens' preferences.

Both economies of scale and spillover effects [points i) and ii)] call for a centralization of public policies because of cost reduction and because of the possibility of realizing the correspondence principle. The hypothesis that large jurisdictions could inherently have a more heterogeneous distribution of preferences on the desired level of public policies and the idea that local governments have a deeper knowledge of their citizens' preferences move the balance toward the decentralization of public activities.

Using these ideas, Alesina and Spolaore (1997), Alesina, Angeloni and Etro (2001; 2003) show that in presence of a positive external effect of the public expenditure of a country on the income (welfare) of another country, the level of public expenditure chosen by a social planner is different with respect to the level of the decentralized solution because the social planner decides the optimal level of the public expenditure for the federation by comparing benefits arising from economies of scale and externalities, and the costs of harmonizing policies in the light of the increased heterogeneity of preferences which accompany a larger population.

Alesina and Wacziarg (1999) define the heterogeneity of preferences as the average distance of individuals from the centre, meaning that a country is composed of a group of individuals who must agree on a set of policies and are aligned along a spatial or ideological line. It is clear that in this case a centralization of public policies that increases the affected population size automatically determines greater losses of welfare. On the same topic, Alesina, Baquir and Easterly (1999) and Easterly and Levine (1997) support the idea of decentralization with the argument that ethnic division is an important vehicle of heterogeneity of preferences, an argument which may be quite important in the European context. In general it is claimed that a larger population is likely to be less homogeneous (Alesina, Perotti and Spolaore 1995; Breuss and Eller 2003) because cultural differences between individuals are likely to be positively correlated with the size of the country[1].

As a consequence, on the normative ground, according to this strain of literature the EU should focus on policy areas where economies of scale and externalities are large relative to the heterogeneity of preferences. If the opposite occurs, assignment should be made in favour of national (or even sub-national) governments. Alesina, Angeloni and Schucknecht (2002) construct a series of indicators built on the number of legal, judiciary and other non-

[1] On the other hand, Alesina and Wacziarg (1999) suggest that centralizing policies may induce convergence within Europe by the increased degree of homogeneity thus brought about.

binding acts, emanating from the EU in order to measure the role of European institutions in different policy domains. They find that the action of the EU deviates in many cases from the above normative prescription. In some areas, in particular social protection and agriculture, the European intervention appears to be overextended, while in other areas where economies of scale might exert an important role, in particular defence and foreign relations, it appears too limited. In the same paper the authors use as an alternative source of information, the 2001 Eurobarometer wave, which concerned the question of the assignment of policies between the EU and national states. According to the survey results and to a simulated vote of national representatives in the European Parliament, money and finance, environment, international relations and certain aspects of citizens' and social protection should result in a shared responsibility. A complete centralization would win only for Migration policies. Education, research and culture, Agriculture, Crime, Health and Social Welfare should be undertaken at a national level. Ahrens and Meurers (2004) also use data from Eurobarometer and study heterogeneity of preferences across old and new countries belonging to the EU after the eastward enlargement. They find that heterogeneity across countries is expected to increase significantly. Ferrera (1993) uses the Eurobarometer survey to study preferences of European citizens on the desired level of social policies. He finds a mixed feeling across countries, but also across individuals living within each country, on the desired level of public expenditure on social security, health and unemployment. In general social protection is highly valued by a large majority of Euopean citizens. However country analysis reveals a quite marked variation between the maximalist and the minimalist option. On the same topic Boeri, Boersch-Supan and Tabellini (2001) find, on a representative survey conducted for Italy, Spain, Germany and France, that a majority of citizens oppose cuts to social security and social protection expenditures. However they also find that different opinions on the future of the welfare state are influenced not only by nationality but also by the economic situation of respondents, their labour market state and their age.

3. *The role of preferences in the assignment of competencies between the Eu and national states*

Local governments are closer to their citizens and therefore they will be more responsive to their particular preferences on public policies. Starting from this assumption, the classical theory of fiscal federalism claims that the superiority of the decentralization is a consequence of the ability of local governments to take more account of the tastes of members of each community. This is an advantage when the government offers a uniform quantity of the public good, but it does not mean that the decentralized solution implies the absence of welfare loss from a collective action. As long as preferences are differentiated among members of a community, a public good supplied at a uniform level must always imply compromises among individuals. Even if the uniform level of the local public good is decided by a social planner whose aim is the minimization of welfare losses caused to

citizens by their different tastes on that good, the Pareto-efficient solution implies some welfare loss. The important point made by the decentralization theorem is that the "average" level of the public good, which is supplied by a central government, always imposes welfare losses to citizens of a jurisdiction that are at least as great as the welfare losses expected by the same citizens if they are allowed to consume the "average" level of the same public good set by a local government[2]. Two important points follow: in terms of welfare the centralized solution is equal to the decentralized only if all local governments have the same "average" desired level of the public good; and the gain of the decentralization increases as long as differences across local communities are larger (Oates 1972).

Within the debate upon public functions assignment between the EU and national states, Alesina and Wacziarg (1999) and Alesina, Angeloni and Etro (2001) use this framework in a slightly different context. In order to emphasize the social cost of the centralization of public policies in a federation of national states, they assume that the desired level of public policies is constant within each country, i.e. all citizens in a country have the same desired level of the public policy. It is clear in this case that, at least from the point of view of preferences, the decentralization of public power is always more efficient then the centralization solution. An increase in the intervention of the federation is efficient only if the cost reduction which centralization brings with it can be used to refund individuals for welfare losses they have to accept from a uniform supply. Alesina and Spolaore (1997) assume that individuals who are close to each other in terms of preferences would also like to form a country together. In this case they also assume that geographical closeness implies similar preferences. Besley and Coate (1999) show that disadvantages of the centralization in terms of welfare losses caused by heterogeneity of preferences disappear as long as the central government finances public expenditure through general taxation but local districts can receive different levels of local public goods.

Moving away from the Pareto-efficient/social planner assumption, one must assume some collective decision-making rule usually based on the median voter mechanism and allowing comparison of benefits of majorities with costs of minorities. In these cases the decision to centralize/decentralize leaves someone better off and someone worse off, making welfare comparison dependent on specific value judgments (Persson, Roland and Tabellini 1996). Ellingsen (1998) develops a model where changes in the distribution of preferences across geographic regions and the relative size of regions affect costs and benefits of the decision to centralize or decentralize public policies. Bjorvatn and Cappellen (2003) drop the hypothesis that local communities are inhabited by people with relatively homogeneous tastes and propose a model where people living in a country are not necessarily close in terms of preferences. Local or central decision making on public policies depends on the distribution of preferences, the degree of geographical segregation and the degree of

[2] This result follows from the fact that, the average level of the public good correspond to the Pareto-efficient allocation when the shape of the demand curve for the public good is the same for all individuals along its relevant section. In this case welfare losses can be measured as the squared sum of the distance between the individual and the average level of the public good.

mobility. In particular, they show that, in a particular situation where minorities and majorities are symmetrically distributed across jurisdictions, the centralization may be welfare-superior with respect to the decentralization. This occurs when the median central voter is a moderate and the median local voter has fairly extreme preferences. In this case, assuming that welfare losses are convex, the centralized solution protects local minorities from extreme solutions at a smaller cost (for local majorities) in welfare terms. This result, obtained, as mentioned before, in a rather particular situation, is however interesting because it shows that, even in the absence of economies of scale and externalities, public policies do not necessarily have to be allocated at the lower level of government, as implied by the social planner approach.

When the restrictive assumptions of the model of Bjorvatn and Cappelen are relaxed in order to include more realistic situations, it turns out to be more difficult to derive, on the theoretical ground, general conditions for the welfare dominance of centralization on decentralization. This issue can be fruitfully dealt with at empirical level. In particular, the approach here adopted aims in measuring the attitudes for public expenditures expressed by citizens living in a specific geographical and historical context and in comparing the welfare effects that the heterogeneity of individual preferences for public expenditures imply with the centralized and the decentralized solutions when a median voter mechanism of collective decision is assumed to work at both levels of government.

4. Individual preferences for public expenditures in the European countries: empirical evidence

In this section we present the data we use to give an empirical application to the theoretical approach presented in Section 3, and we discuss the general strategy here adopted to fit the data to the analysis of the role of individual preferences in the choice between centralized/decentralized provision of public services.

4.1 The data

The data used in this empirical application are taken from the International Social Survey Programme (ISSP). The ISSP is a continuing programme of cross-national surveys covering topics relevant for social science research such as social inequality, work orientations, changing role of family and gender, public intervention, and so on[3]. In particular, the survey Role of Government III, conducted in 1996-97 over the population of 23 different countries, is specifically devoted to the analysis of individual attitudes towards the scope of public action; the main tasks to be assigned to the government; the means of public intervention in terms of taxation, public expenditures, regulation; the role of trade unions and of the business community; the functioning of the democratic system; the participation in political issues.

[3] A comprehensive presentation of ISSP is reported at www.gesis.org/en/data%5Fservice/issp. For two interesting applications of IISP data to the analysis of people's attitudes towards redistribution accomplished by the government see Corneo and Gruner (2002), and Bernasconi (2004).

Survey questions V25-V32 are of particular interest for our analysis. They ask individuals whether they would like to see more or less government spending in a series of 8 different areas of public intervention: 1) "environment", 2) "health", 3) "police and law enforcement", 4) "education", 5) "military and defense", 6) "old age pensions", 7) "unemployment benefits", and 8) "culture and arts". Respondents can choose among 5 different possible qualitative answers: "spend much less", "spend less", "spend the same as now", "spend more", "spend much more" together with a residual possibility "can't choose".. Moreover, in order to avoid their not considering individual costs, the respondents are warned that if they choose "spend much more" they might be subject to a tax increase to pay for it. In addition to these questions, the survey provides detailed information (even if not available for all the countries considered) about the socio-economic characteristics of respondents such as gender, age, marital status, household composition, education level, occupation, family income, party affiliation, etc.

If we exclude the new entrants in May 2004, the survey includes 7 EU member countries: Germany, Great Britain, Italy, Ireland, Sweden, Spain and France, that in total accounted for more than 75% of the EU population in 1996. After discarding those observations that do not carry complete information about the most relevant socio-economic characteristics of the respondents, the sample here considered totals more than 6,200 individual observations[4].

Table 1 reports the distributions of frequencies of the answers recorded by the survey relative to each combination of public expenditures category/country. Moreover, a distribution of frequencies corresponding to the sum of these countries (hereafter referred to as the EU) has been derived for each category of public expenditure as the weighted average of the distributions referred to each country, the weights given by the population share of that country over the total population of the EU.

Even if the distribution of answers differs across countries and across categories of public expenditure, some common traits can be recognized. First of all, in less than half (46%) of the country/category of public expenditure cases the answer "the same", which denotes a positive evaluation of the current level of provision, turns out to be the modal answer. On the contrary, in 45% of cases the relative majority of people require "more" public expenditure, whereas in the remaining 9% most people favour "less" public expenditure. Moreover, if we individually consider each category of public expenditure, for most public services the modal case is in favour of "more" expenditure in most of the countries, and this support is particularly strong in the case of "education" and "health" (respectively 6 and 5 countries out of 7). The exceptions are "unemployment benefits", and "culture and arts", where in most of the countries a relative majority of people support the current level of public provision, and "military and defence", where, on the contrary, in 4 countries out

[4] The several missing values that affect the data reported in the ISSP survey have compelled a severe reduction in the size of the considered sample. This problem refers particularly to the information concerning individual and family income, that is affected by refusal to answer, misunderstanding and so on. Moreover, income data are recorded according to definitions that are sometimes different across countries (net or gross of taxes and social contributions, continuous or by intervals, etc.).

of 7 the modal case corresponds to a reduction ("less") or a strong reduction ("much less") of public intervention. Finally, when we flip through the countries, a highly differentiated scenario emerges. Sweden, France and Germany are countries where the relative majority of respondents are satisfied with the current levels of provision for the most public services (respectively 6 out of 8; 6 out of 8; 5 out of 8), whereas in Spain and Italy the modal answer is for an increase in public expenditure in most of the sectors (respectively 6 out of 8; 5 out of 8).

In order better to appreciate the differences in the distributions of preferences across countries and sectors of public expenditure, it is worthwhile summing up those distributions by resorting to a summary index of dispersion. The relative index of dispersion for ordered variables proposed by Leti (1983, 295) d is appropriate to the case here considered, given the categorical but also inherently ordered nature of the variable recording the choice most preferred by the respondents[5]. In particular:

$$d = \frac{4\sum_{h=1}^{k-1} F_h(1-F_h)}{k-1}$$

where k denotes the number of possible outcomes and F_h the relative cumulative frequency. d is maximum ($d=1$) (the dispersion of outcomes is maximum) when population is equally distributed in the two extreme cases ("spend much less" and "spend much more"). On the contrary, d (and the dispersion) takes its minimum value ($d=0$) when the whole population agree on the same answer, whatever it is. Table 2 reports the values of d at each combination of public expenditure category/country.

First of all, note that the values of d are relatively little differentiated across public expenditure categories and countries, always between 0.4 and 0.6. If we look at the sectors of public expenditure one by one, "military and defense", "unemployment benefits" and "culture and arts" are the categories that show a dispersion of preferences higher in the average of the countries than the other public services[6]. In particular, the preferences expressed in Italy about "unemployment benefits", in France about "culture and arts" and in Spain about "military and defense" are particularly polarized. On the contrary, "old age pensions" seems to be the sector where the preferences among people in each country seem to be less differentiated. Finally, at the level of individual countries, Great Britain is the country where preferences for public spending (in the average of all categories) are less dispersed, whereas in France people are more differentiated in their opinions about public intervention.

[5] The Leti index of dispersion accounts not only for the distribution of frequencies but also for the ranking inherent in the possible answers ("spend much less", "spend less", "spend the same as now", "spend more", "spend much more") and is therefore responsive to the distance between the various outcomes (for example, the difference between "spend much less" and "spend much more" is greater than between "spend much less" and "spend less").

[6] The calculation of the average, and in general the comparison across categories and across counties, is however affected by the issues discussed in Section 4.2.

4.2 Empirical issues in dealing with survey data

The distributions of frequencies recorded by the survey and reported in Table 1 cannot, however, be taken as an adequate measurement of the distributions of preferences for public expenditure in the different countries, and this for two different reasons that affect the data just presented. On one hand, the randomness associated with the small national samples of observations included in the survey requires that the phenomenon at stake be econometrically modelled and that the probabilities of the different outcomes be predicted from that model. The distributions of estimated probabilities for the sample on which we estimated the model obviously differ from the distributions of observed probabilities. In Section 4.3, we ran a series of regressions including among the explanatory variables, together with standard controls (sex, age, occupational status, income), a complete set of country-specific dummy variables.

On the other hand, the comparability of the distributions of preferences across countries and categories of public expenditures is critical for the ultimate goal of this paper: to compare the welfare effects that the heterogeneity of individual preferences for public expenditures imply with the centralized and decentralized solutions. In this perspective, the data here considered suffer from what we would refer to as a "reference" problem. Indeed, the way in which the questions about the desired variations of public expenditures are formulated (see Section 4.1) implies that the answers are given by each respondent making reference to the current level of expenditures actually implemented in their own country. The consequence is that, for example, the answer "more" given by people living in a country where the level of public expenditure is quite low may not be compared with the same answer recorded in a country where public intervention is stronger but, to some extent (given the qualitative nature of the variable), with the answer "the same" eventually given in that country. A possible strategy to address this problem consists in generating out-of-sample predictions of the distributions of preferences for a sample that is different from the estimation sample in which the country-specific dummies are set equal to zero for all the considered countries. This means clearing the predicted probabilities from the effect produced by the nationality of respondents, by proceeding as if all observations were referred to the country excluded from the estimation in order to avoid the dummy trap (see Section 4.3). Clearly this approach is affected by a series of evident drawbacks. Firstly, it critically relies on the assumption that all the respondents living in a country experience the same level of public services, uniformly provided throughout the country, and, as a consequence, this common trait can be effectively captured by the country-specific dummy. Secondly, it assumes the level of public intervention to be the main determinant of the national identity, thus overshadowing the relevance of other common cultural, political, and institutional factors in influencing the formation of individual preferences.

4.3 Estimation results

According to the strategy described in Section 4.2, a series of ordered probit models has been distinctively estimated in order to analyze the individual attitudes toward each category of public expenditure recorded by the survey.

The general form of the ordered probit model is:

$$Y_i^* = \mathbf{X_i}\boldsymbol{\beta} + \varepsilon_i$$

where Y_i^* is the unobserved variable measuring the variation of the *j*-th public expenditure category desired by the *i*-th respondent, $\mathbf{X_i}$ a vector of explanatory variables, and ε_i the error term assumed to be normally distributed across the observations. What we observe is a variable Y_i (corresponding to the answers to the relevant questions in the survey) such that:

$$Y_i = 0 \quad if\ Y_i^* \le \mu_1$$
$$Y_i = 1 \quad if\ \mu_1 < Y_i^* \le \mu_2$$
$$Y_i = 2 \quad if\ \mu_2 < Y_i^* \le \mu_3$$
$$Y_i = 3 \quad if\ \mu_3 < Y_i^* \le \mu_4$$
$$Y_i = 4 \quad if\ Y_i^* > \mu_4$$

where μ's are unknown parameters (cut-points) to be estimated together with the vector $\boldsymbol{\beta}$. Therefore, the probability of observing the *k*-th outcome corresponds to the probability that the estimated linear function plus the error term lies within the range of the relevant cut-points estimated for that outcome:

$$\Pr ob(Y_i = 0) = \Phi(\mu_1 - \mathbf{X_i}\boldsymbol{\beta})$$
$$\Pr ob(Y_i = 1) = \Phi(\mu_2 - \mathbf{X_i}\boldsymbol{\beta}) - \Phi(\mu_1 - \mathbf{X_i}\boldsymbol{\beta})$$
$$\Pr ob(Y_i = 2) = \Phi(\mu_3 - \mathbf{X_i}\boldsymbol{\beta}) - \Phi(\mu_2 - \mathbf{X_i}\boldsymbol{\beta})$$
$$\Pr ob(Y_i = 3) = \Phi(\mu_4 - \mathbf{X_i}\boldsymbol{\beta}) - \Phi(\mu_3 - \mathbf{X_i}\boldsymbol{\beta})$$
$$\Pr ob(Y_i = 4) = 1 - \Phi(\mu_4 - \mathbf{X_i}\boldsymbol{\beta})$$

where Φ is the cumulative standard normal distribution.

As stressed by Greene (2000, 878), the interpretation of the estimated coefficients of this model is far from obvious. The direction of the marginal effects of the regressors on the probabilities of observing the different outcomes may be different from the sign of the corresponding estimated coefficients. Therefore, the marginal effects of changes in the regressors must be directly calculated:

$$\frac{\partial \Pr ob(Y_i = 0)}{\partial x} = -\phi(\mu_1 - \mathbf{X_i}\boldsymbol{\beta})\boldsymbol{\beta}$$
$$\frac{\partial \Pr ob(Y_i = 1)}{\partial x} = \left[\phi(\mu_1 - \mathbf{X_i}\boldsymbol{\beta}) - \phi(\mu_2 - \mathbf{X_i}\boldsymbol{\beta})\right]\boldsymbol{\beta}$$
$$\frac{\partial \Pr ob(Y_i = 2)}{\partial x} = \left[\phi(\mu_2 - \mathbf{X_i}\boldsymbol{\beta}) - \phi(\mu_3 - \mathbf{X_i}\boldsymbol{\beta})\right]\boldsymbol{\beta}$$
$$\frac{\partial \Pr ob(Y_i = 3)}{\partial x} = \left[\phi(\mu_3 - \mathbf{X_i}\boldsymbol{\beta}) - \phi(\mu_4 - \mathbf{X_i}\boldsymbol{\beta})\right]\boldsymbol{\beta}$$
$$\frac{\partial \Pr ob(Y_i = 4)}{\partial x} = \phi(\mu_4 - \mathbf{X_i}\boldsymbol{\beta})\ \boldsymbol{\beta}$$

where ϕ is the standard normal density.

Table 3 reports the marginal effects and their corresponding z-values calculated after the estimation of the 8 ordered probit models referred to each category of public expenditure considered in the survey.

All the regressions use the same set of independent variables, including standard control variables available in the survey for all countries considered (sex, age, occupational status) together with a complete set of country-specific dummy variables. The variable income equals the difference between the natural logarithm of the repsondent's income and the natural logarithm of the average income in the respondent's country. In addition we have referred to two different questions included in the survey in order to capture the attitude of the respondents toward public intervention in general. The answers to the question "Does the government have too much power or too little power?" (V35) and those to the question "If the government had a choice between reducing social services or spending more on them, which do you think it should do?" (V56) have been used to define the explanatory variables "Power" and "Tax" respectively. A detailed description of the regressors is given in Table A.1 of the Appendix. In the interpretation of the estimation results in terms of marginal effects, note that in order to avoid the dummy trap one outcome for each dummy variable has been excluded from the regression. Therefore the marginal effects must be interpreted as marginal deviation from a reference type that can be described as male (sex = 1), aged 18-30 (age = 1), employee (occ = 1), resident in Germany (country = 1), that answers "Far too much power/Too much power" to the Question: "Does the government have too much power or too little power?", and that answers "Reduce taxes, even if this means spending less" to the question "If the government had a choice between reducing the or spending more on social services, which do you think it should do?".

In the following, we summarize the main estimation results. As for the gender of the respondent, being female enhances the preferences for more public expenditures in "health", "military and defense", "old age pensions", "unemployment benefits" and "culture and arts" (statistically significant marginal effects positive for "much less" and "less" outcomes and negative for "more" and "much more" outcomes).

As expected, the age of the respondent turns out to have effects of different sign on the various sectors of public intervention here considered. Getting old implies favouring more expenditure for "police and law enforcement", for "military and defense", and for "old age pensions"; and, on the contrary, less expenditure for "environment", and for "education". The other categories of public expenditure seem not to be significantly affected by age, except for "unemployment benefits" where the 60-75 years-old group supports a reduction of public intervention.

Turning to the role of the occupational status, for many categories of public expenditures the corresponding coefficients are statistically non-significant. However, there are some exceptions. The status of self-employed implies (as against that of employee) stronger preferences for an increase of public expenditure for "environment", and for a reduction of "unemployment benefits". Finally, consistently with the expectations, belonging to the

group of "other" occupational positions (unemployed, student, retired, housewife, etc.) implies a request for more public expenditures in "unemployment benefits" and in "police and law".

Though care must be taken in interpreting the evidence on the role of family income (see note 4), the latter turns out to be powerful in accounting for individual attitudes toward public expenditures. In particular, rich people are more likely to support high expenditure for "environment", "culture and arts" and "education", but wealth reduces the probability of favouring more expenditure on "health", "military and defense", "old age pensions" and "unemployment benefits" (the last two categories to a large extent, too). These findings can be in some measure interpreted in terms of the standard economic differentiation between luxuries and necessities (respectively, the first and the second group of categories of public services). In particular, environment and culture are often seen as a kind of publicly provided services that meet second-level needs of population, being increasingly developed as real living standards rise.

The evidence stemming from the two variables "Power" and "Tax" intending to capture the general attitudes for public intervention is to some extent more mixed. As for the variable "Power", people feeling more sympathetic towards the government (government has too little power) favor more public spending in the sectors of "environment", "police and law enforcement", and "culture and arts", but desire an expenditure reduction for "health", "old age pensions" and "unemployment benefits". The general picture is therefore that those backing public intervention require a switch in the composition of the public budget in favor of the more innovative sectors and to the detriment of the more traditional programs of the welfare state. Turning to the "Tax" variable, people who oppose the idea of the Minimal State and support a reinforcement in the fiscal exchange with the government ("Spend more, even if this means higher taxes") are for an increase in all the sectors of public expenditure, with only two exceptions — namely, in the case of "military and defense" (where the variable "Tax" displays a negative, statistically significant sign for an increase in public spending) and "police and law enforcement" (that, however, displays statistically non-significant effects).

Many of the national dummy variables exhibit statistically significant coefficients. With respect to Germany (reference case), the marginal effects across categories of public expenditure and countries are fairly differentiated in terms of sign, size, and statistical significance. As mentioned before, this is the result of a wide array of cultural, political, and institutional factors together with the differences in the current level of expenditures with reference to which national respondents have expressed their opinions. In summary, in the case of environment, people living in Great Britain, Italy, Sweden and France are more likely to support high expenditures for "environment". Analogously, living in Great Britain, Italy, Ireland, Sweden and Spain enhances the preference for the public intervention in "health", while the contrary happens in France. As for public spending in "police and law enforcement", dummy variables denoting Great Britain and Ireland display positive coefficients with the "more" and "much more" cases, whereas Italy, Sweden and France

show the opposite response. People resident in Great Britain, Italy, Spain and France are in favour of more public expenditure in "education". "Military and defense" expenditure is supported by those living in Great Britain, Ireland, Sweden and Spain, but not by Italians. Statistically significant positives on the probability of favoring more expenditure in "old age pensions" are recorded in Great Britain, Italy and Spain, but not in France. Living in Italy, Ireland and Spain is associated with the request for higher public spending in the sector of "unemployment benefits", while dummy variables denoting Great Britain and France exhibit opposite signs. Finally, in the case of "culture and arts", the country-effects are in favour of an increase in the amount of public intervention in Italy, Ireland, and Spain, as against in Great Britain.

As sketched in Section 4.2, in order to address the "reference" problem and to make individual preferences comparable across countries, we rely on estimation results presented in Table 3 to generate the predicted distributions of preferences for a sample where all the national dummy variables are now set equal to zero. Given that Germany is, as mentioned before, the country excluded from the estimation to avoid the multicollinearity implied by the dummy trap, this is equivalent to assuming the whole sample as if it comprised only people living in Germany (and therefore fully comparable among themselves). Table A.2 reports the distributions of preferences for public expenditures estimated and corrected for the "reference" problem. These distributions are the basis for the subsequent steps of our analysis.

5. *The welfare effects of the centralized/decentralized solutions*

The political economy literature of public expenditures is largely based on the median voter hypothesis (Persson and Tabellini 1999). Assuming that the outcome of majority voting corresponds to the choice of the median voter enables powerful simplification of the theoretical and empirical analysis of the collective choice mechanism, even if different strands of criticism have been levelled against this hypothesis (limitations on individual preferences, uni-dimensionality of policy space, etc.). In this Section we assume that a median voter mechanism of collective decision is assumed to work both at national and EU level in each sector of public expenditure.

Using this simplified scheme we simulate a collective decision process which predict, for both the national and the EU level of government, the (qualitative) level of public intervention for each sector of expenditure. Each individual suffers a welfare loss if his/her choice is different with respect to the choice of the median voter. In the simulations presented in this section we contrast welfare losses expected by representative individuals of our data set when public expenditure on each function is decided (separately) by the national median voter, with welfare losses that the same set of individuals would bear were the public expenditure level for each function decided by the EU median voter. The welfare comparison of these two highly simplified allocations enables us to evaluate

whether, net of gains expected from economies of scale and internalization of externalities, a centralized provision would impose higher costs than the decentralized solution in terms of welfare to individual.

Based on individual preferences for public expenditures estimated in Section 4.3 and transformed as discussed above, Table 4 shows the choices of the median voter for each country and for the EU.

The choices of national median voters appear to be fairly homogeneous. In particular, it turns out that in five out of eight sectors the majority of national median voters support an increase of the expenditure ("environment", "health", "police and law enforcement", "education", "old age pension"), in two of them the (adjusted) current level ("unemployment benefits", "culture and arts") and, finally, in the case of "military and defense" a reduction of public spending. The same picture emerges when the choices of the median voter are considered in the context of the EU. In order to get a measure of the dispersion of collective choices across countries we compute, for each public function, the coefficient of variation of choices made by the national median voter. The coefficient is equal to zero in the case of "education", where the choice by the median voter is the same overall. It is equal to 0.2235 for "heath" and to 0.2946 for "unemployment benefits", where only one country takes a decision different from the others. It increases for other functions, reaching its maximum value in the case of "military and defence" expenditure. When the coefficient of variation is considered for the different sectors of public expenditure in each single country, Ireland has the lowest value (0.3497) and Grat Britain the maximum (0.6479). With the exception of these two countries the coefficient of variation of the EU is quite similar to those of remaining countries.

The next step consists in deriving a measure of welfare losses suffered by each individual when the level of public expenditures chosen by the median voter. In order to make calculation possible at this stage, we have to assign a "quantitative" measure to the "qualitative" estimated preferences. We have decided to transform the qualitative scale of answers on the desired level of public expenditures into a linear series from one to five, where one identifies the option "spend much less", two the option "less", and so on. Moreover, following Bjorvatn and Cappellen (2003), we have defined the welfare loss suffered by the *i*-th individual as:

$$L_i = f\left(|h_i - h_m|\right)$$

where f is the loss function for each individual, h_i is the desired choice of the individual i and h_m is the choice of the median voter. Some critical points should be noted. In the empirical calculations we will assume that: i) the loss function is convex ($f' > 0$ and $f'' > 0$); ii) the specification of the loss function is identical for each individual. We have tried different specifications for the loss function. Although results are different in their absolute value, the sign does not change. The loss function adopted in the base case is the following:

$$L_i = \left(|h_i - h_m|\right)^3$$

Table 5 reports the welfare loss in this way derived in the case of decentralized and centralized solution. The figures reported in the table are determined as the sum of individual losses for any combination country/sector of public expenditure. In the upper section of the table welfare losses are computed with respect to the corresponding national median voter choice. The lower section of the table does the same in the case that the collective choice is taken by the EU median voter. In the last columns to the right-hand side (EU) welfare losses are summed across the countries respectively in the decentralized and the centralized solution.

By comparing the results presented in the EU column for the decentralized and the centralized solutions we obtain a measure of the gain/losses expected from the centralization of a specific public function. Only for "health" does a clear dominance for the centralized solution emerge. For "employment benefits" and "education" the comparison of the two solutions displays a situation of substantial neutrality, whereas in all the remaining sectors the uniform level of expenditure chosen by the EU median voter implies a loss in welfare terms that in some cases, in particular "police and law enforcement" and "culture and arts", results to be particularly relevant.

Finally, the welfare effects of the centralization of public policies can be measured for each single country. In this case we contrast the "sum of public expenditures" measured in the two solutions. Unsurprisingly, the comparison shows that the complete centralization of public policies would be costly for all the countries. Welfare losses are particularly heavy in the case of Great Britain, Italy and Ireland. France holds an intermediate position, whereas the welfare losses would be almost negligible in Germany and Spain.

The results now discussed at least partially contradict the policy recommandations put forward by the existing economic literature that, following a more qualitative approch than what here adopted, tries to consider consumer preferences in a wider theorethical and empirical framework including economies of scale and scope, and territorial externalities. For example, Bertola et al. (1999) claim that in the case of social policies providing contingent insurance (including unemployment benefits and certain forms of health insurance) EU interference should not go beyond the specification of minimum contribution rates and regulation of the of the overall character of the scheme, excluding in particular the desidarability of a central co-financing of expenditures. More generally, Breuss and Eller (2003) point out education and research, on the one hand, and social policies, on the other hand, as remarkable examples of public functions where the optimal assignment across different levels of government is discussed contradictorily by the literature, depending on the research focus the different authors have chosen. In the case of education some contributions highlight relevant arguments in favor of decentralization, including consideration of heterogeneous local preferences, effects of inter-jurisdictional competition or limited cross-national externalities (Alesina et al. 2001; Persson et al. 1996).

On the contrary, other authors find reasons supporting EU responsibility in the field of education for example emphasizing the adverse effects that national and sub-national provision could produce on the formation of human capital (Ter-Minassian 1997). In the case of social policies as well, heterogeneity of local preferences and inter-jursdictional competition are recalled as arguments in favor of national and sub-national competencies, whereas the danger of social dumping across countries and the role of social risk-pooling offered by the central intervention are put forward to recommend the EU-level competence.

6. Concluding remarks

The theory of fiscal federalism looks at the heterogeneity of preferences across individuals living in a jurisdiction, together with interregional spillovers and economies of scale, as a guide for the optimal assignment of competencies between central and local governments. When applied to the issue of assignment of public expenditure competencies between the EU and the member countries, this principle implies that a social planner aiming to welfare maximization decides to centralize if the benefits deriving from economies of scale and internalization of externalities compensate costs that a large union of countries causes to citizens in term of heterogeneity of preferences. Moving away from the restrictive assumptions of this theoretical approach it turns out to be more difficult to derive clear and unambiguous conditions for the welfare dominance of centralization on decentralization.
In this paper we tried to deal with this issue from an empirical perspective. In particular, data from a large international survey (ISSP) are used to estimate a series of econometric models in order to make individual attitudes for public expenditures representative and comparable across different categories (environment, health, police and law enforcement, education, military and defense, old age pensions, unemployment benefits, culture and arts) and different EU countries (Germany, Great Britain, Italy, Ireland, Sweden, Spain and France). Estimation results confirms the explanatory power of social, economic and demographic factors such as sex, age, occupational status and relative position in the income distribution in shaping individual preferences for public expenditures, with effects that are generally consistent with the theory. Political and ideological attitude for public intervention in the economy seems to back a switch in the composition of the public budget in favor of the more innovative sectors and to detriment of the more traditional programs. Many of the national dummy variables exhibit statistically significant coefficients, resulting from the diversity in cultural, political, and institutional factors together with the differences in the current level of expenditures with reference to which national respondents expressed their opinions. This makes possible inter alia to clear the predicted distributions of preferences from the effect of this "reference" problem by

generating out-of-sample predictions for a sample in which all the country-specific dummies are set equal to zero.

In the second section of the paper these distributions of preferences for public expenditures (estimated and corrected for the "reference" problem) have been used to simulate the functioning of a collective decision mechanism based on the median voter hypothesis both at the level of each country and of the sum of these countries, with the aim of mimicking the national and the EU solution in the allocation of competencies. By assuming an individual convex loss function and comparing the welfare effects in centralized and decentralized solutions, we derive a welfare criterion in order to evaluate which sectors of public expenditure should more efficiently be primarily assigned to the EU level or to the national governments. The empirical analysis reveals that in some sectors of public expenditure (health, education, employment benefits) the assignment of responsibilities to the EU level welfare dominates (or is close to dominating) decentralization, even in the absence of economies of scale and interregional spillovers. In all the remaining areas of public intervention centralization of public policies implies a net loss in welfare terms with respect to the decentralization solution.

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Tab.1 Preferences for public expenditure categories - distribution of observed frequencies

public expenditure		country							
		Germany	Great Britain	Italy	Ireland	Sweden	Spain	France	EU
environment	much less	0.004	0.010	0.015	0.008	0.006	0.004	0.036	0.014
	less	0.052	0.041	0.076	0.052	0.044	0.046	0.081	0.059
	the same	0.347	0.487	0.318	0.404	0.438	0.284	0.409	0.376
	more	0.366	0.373	0.431	0.413	0.372	0.482	0.328	0.388
	much more	0.231	0.089	0.159	0.124	0.141	0.184	0.145	0.164
	obs	1158	608	851	775	804	1221	826	6243
health	much less	0.005	0.002	0.009	0.001	0.002	0.000	0.037	0.010
	less	0.070	0.005	0.036	0.009	0.011	0.014	0.118	0.051
	the same	0.399	0.070	0.201	0.154	0.230	0.171	0.381	0.258
	more	0.329	0.471	0.467	0.478	0.501	0.556	0.292	0.411
	much more	0.196	0.453	0.287	0.358	0.256	0.259	0.172	0.270
	obs	1166	633	865	779	805	1275	838	6361
police and law enforcement	much less	0.011	0.006	0.055	0.004	0.014	0.005	0.051	0.025
	less	0.056	0.018	0.170	0.019	0.045	0.043	0.086	0.073
	the same	0.349	0.222	0.445	0.204	0.476	0.288	0.470	0.359
	more	0.384	0.528	0.275	0.389	0.371	0.487	0.292	0.387
	much more	0.201	0.227	0.056	0.384	0.094	0.177	0.101	0.156
	obs	1162	618	834	779	800	1266	828	6287
education	much less	0.013	0.002	0.016	0.003	0.000	0.003	0.037	0.014
	less	0.064	0.010	0.037	0.018	0.030	0.016	0.059	0.040
	the same	0.394	0.129	0.234	0.333	0.360	0.209	0.280	0.266
	more	0.370	0.522	0.474	0.415	0.438	0.532	0.386	0.445
	much more	0.160	0.337	0.238	0.231	0.172	0.240	0.238	0.235
	obs	1163	626	862	780	803	1265	842	6341
military and defense	much less	0.299	0.102	0.410	0.052	0.198	0.202	0.316	0.267
	less	0.357	0.257	0.309	0.218	0.327	0.370	0.339	0.325
	the same	0.258	0.464	0.204	0.487	0.343	0.272	0.265	0.296
	more	0.064	0.144	0.057	0.179	0.106	0.119	0.057	0.086
	much more	0.023	0.033	0.020	0.064	0.026	0.038	0.023	0.027
	obs	1148	606	854	770	804	1253	841	6276
old age pensions	much less	0.003	0.005	0.024	0.000	0.001	0.002	0.035	0.013
	less	0.054	0.006	0.054	0.006	0.025	0.020	0.081	0.044
	the same	0.506	0.179	0.242	0.258	0.429	0.289	0.570	0.373
	more	0.315	0.519	0.504	0.442	0.399	0.514	0.207	0.398
	much more	0.123	0.291	0.176	0.294	0.146	0.175	0.107	0.171
	obs	1151	632	847	776	797	1271	828	6302
unemployment benefits	much less	0.027	0.054	0.089	0.017	0.027	0.024	0.136	0.064
	less	0.184	0.155	0.115	0.112	0.146	0.082	0.242	0.161
	the same	0.502	0.432	0.293	0.406	0.435	0.351	0.422	0.412
	more	0.216	0.283	0.369	0.314	0.300	0.399	0.149	0.272
	much more	0.070	0.076	0.135	0.151	0.092	0.143	0.051	0.091
	obs	1151	607	846	774	804	1252	839	6273
culture and arts	much less	0.114	0.307	0.049	0.079	0.161	0.015	0.193	0.142
	less	0.300	0.343	0.098	0.169	0.291	0.093	0.230	0.229
	the same	0.446	0.269	0.418	0.524	0.407	0.404	0.388	0.390
	more	0.117	0.074	0.332	0.171	0.100	0.378	0.143	0.187
	much more	0.023	0.008	0.103	0.057	0.041	0.110	0.046	0.052
	obs	1140	610	843	776	797	1232	830	6228

Tab.2 Preferences for public expenditure categories - relative Leti index

	country							
public expenditure	Germany	Great Britain	Italy	Ireland	Sweden	Spain	France	EU
environment	0.475	0.388	0.474	0.421	0.424	0.424	0.512	0.456
health	0.482	0.326	0.442	0.379	0.391	0.357	0.558	0.439
police and law enforcement	0.477	0.391	0.500	0.439	0.403	0.419	0.496	0.458
education	0.467	0.357	0.453	0.429	0.409	0.380	0.538	0.443
military and defense	0.536	0.499	0.535	0.490	0.548	0.574	0.538	0.534
old age pensions	0.410	0.376	0.457	0.408	0.399	0.383	0.448	0.415
unemployment benefits	0.463	0.517	0.609	0.506	0.491	0.489	0.561	0.524
culture and arts	0.486	0.524	0.510	0.488	0.544	0.458	0.597	0.517

Tab. 3 Oprobit estimation results (marginal effects)

		environment		health		police and law enforcement		education		military and defense		old age pensions		unemployment benefits		culture and arts	
	n. obs	6243		6361		6296		6341		6276		6302		6273		6228	
	log likelihood	-7570.2483		-7467.2939		-7825.648		-7594.5723		-8387.4216		-7179.2101		-8324.2397		-8189.8636	
	variable	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z
MUCH LESS	sex*	-0.001	-1.09	-0.002	-3.60	0.000	0.40	-0.001	-1.67	-0.020	-2.23	-0.002	-3.34	-0.009	-3.56	-0.019	-4.04
	cage2*	0.003	3.29	-0.001	-1.89	-0.002	-1.01	-0.002	-2.19	0.005	0.38	-0.002	-3.13	0.000	-0.05	0.002	0.34
	cage3*	0.008	7.76	-0.001	-2.26	-0.007	-5.07	0.002	1.91	-0.058	-4.95	-0.002	-3.54	-0.002	-0.59	0.003	0.44
	cage4*	0.019	11.55	0.000	-0.53	-0.012	-7.72	0.007	3.71	-0.113	-9.19	-0.005	-6.14	0.016	3.28	0.014	1.73
	cage5*	0.027	7.04	0.001	0.90	-0.011	-5.82	0.012	2.56	-0.153	-9.30	-0.002	-1.19	0.016	1.59	-0.015	-1.16
	power2*	-0.001	-1.49	0.003	4.93	0.001	0.92	0.002	2.08	0.002	0.21	0.005	5.62	0.010	3.37	-0.034	-7.14
	power3*	-0.003	-2.97	0.003	3.05	-0.005	-3.41	-0.001	-0.51	-0.002	-0.16	0.004	2.97	0.022	4.01	-0.022	-3.44
	tax*	-0.008	-12.45	-0.005	-6.59	0.000	0.30	-0.010	-8.22	0.074	7.63	-0.004	-6.13	-0.036	-12.51	-0.050	-10.59
	occ2*	-0.003	-3.60	0.001	0.69	0.004	1.45	-0.002	-1.27	0.018	1.03	0.002	1.84	0.036	5.03	-0.013	-1.74
	occ3*	-0.002	-2.18	-0.001	-1.31	-0.004	-2.53	-0.002	-2.35	0.007	0.58	-0.001	-1.26	-0.011	-3.33	-0.008	-1.43
	linc	-0.002	-3.16	0.002	5.31	-0.001	-0.92	-0.002	-2.80	0.023	2.98	0.005	6.79	0.026	10.74	-0.021	-5.10
	country2*	0.018	10.63	-0.006	-6.73	-0.009	-6.52	-0.011	-9.00	-0.181	-18.83	-0.007	-7.41	0.016	3.15	0.160	11.56
	country3*	0.006	5.41	-0.004	-6.14	0.052	9.45	-0.007	-6.85	0.062	4.24	-0.004	-5.91	-0.021	-7.15	-0.096	-21.84
	country4*	0.007	1.71	-0.004	-6.19	-0.013	-6.76	-0.006	-3.05	-0.190	-10.47	-0.006	-6.81	-0.025	-4.04	-0.047	-3.50
	country5*	0.008	3.01	-0.003	-5.46	0.016	2.58	-0.003	-1.91	-0.093	-4.35	-0.003	-2.53	-0.013	-2.27	0.020	1.25
	country6*	0.002	2.17	-0.004	-6.19	-0.004	-2.29	-0.008	-7.60	-0.107	-9.47	-0.005	-6.51	-0.026	-9.29	-0.104	-23.62
	country7*	0.015	10.65	0.003	3.17	0.026	7.17	-0.004	-4.36	-0.006	-0.45	0.005	3.88	0.042	7.15	0.006	0.89
LESS	sex*	-0.003	-1.09	-0.008	-4.02	0.001	0.40	-0.003	-1.68	-0.004	-2.19	-0.007	-3.56	-0.019	-3.58	-0.022	-4.02
	cage2*	0.013	3.16	-0.005	-1.92	-0.004	-1.01	-0.005	-2.20	0.001	0.39	-0.008	-3.26	0.000	-0.05	0.002	0.34
	cage3*	0.033	6.83	-0.006	-2.32	-0.019	-5.16	0.006	1.96	-0.014	-3.95	-0.009	-3.73	-0.004	-0.59	0.003	0.44
	cage4*	0.066	9.11	-0.002	-0.53	-0.032	-8.32	0.016	4.09	-0.037	-5.99	-0.019	-7.83	0.030	3.48	0.016	1.79
	cage5*	0.085	5.47	0.007	0.94	-0.031	-5.38	0.025	2.93	-0.080	-4.88	-0.006	-1.16	0.029	1.75	-0.018	-1.08
	power2*	-0.004	-1.50	0.017	6.59	0.003	0.92	0.005	2.13	0.000	0.21	0.018	7.31	0.019	3.49	-0.041	-6.88
	power3*	-0.013	-3.18	0.015	3.53	-0.014	-3.31	-0.002	-0.50	0.000	-0.16	0.012	3.30	0.040	4.51	-0.028	-3.16
	tax*	-0.035	-11.41	-0.028	-11.68	0.001	0.30	-0.024	-10.73	0.013	7.04	-0.016	-7.92	-0.076	-13.92	-0.060	-10.35
	occ2*	-0.017	-3.99	0.003	0.71	0.009	1.51	-0.004	-1.24	0.003	1.20	0.008	1.94	0.061	6.05	-0.017	-1.65
	occ3*	-0.008	-2.18	-0.003	-1.33	-0.009	-2.57	-0.006	-2.39	0.001	0.59	-0.003	-1.27	-0.022	-3.37	-0.010	-1.43
	linc	-0.008	-3.14	0.013	7.10	-0.002	-0.92	-0.005	-2.87	0.004	2.90	0.018	9.73	0.053	11.5	-0.024	-5.07
	country2*	0.062	8.39	-0.036	-15.51	-0.026	-6.63	-0.030	-13.31	-0.090	-10.14	-0.029	-13.24	0.031	3.43	0.109	18.47
	country3*	0.025	4.85	-0.023	-9.69	0.095	12.98	-0.018	-7.84	0.008	6.06	-0.017	-7.51	-0.048	-6.89	-0.152	-19.52
	country4*	0.027	1.50	-0.029	-9.44	-0.041	-5.99	-0.016	-2.77	-0.131	-4.71	-0.027	-9.23	-0.062	-3.26	-0.070	-2.72
	country5*	0.030	2.61	-0.022	-6.71	0.035	2.99	-0.009	-1.82	-0.035	-2.74	-0.011	-2.43	-0.030	-2.06	0.022	1.37
	country6*	0.010	2.08	-0.023	-9.77	-0.009	-2.25	-0.021	-9.11	-0.035	-6.23	-0.019	-8.86	-0.062	-9.09	-0.168	-21.93
	country7*	0.054	8.55	0.013	3.58	0.055	8.96	-0.011	-4.52	-0.001	-0.43	0.016	4.46	0.071	8.61	0.007	0.91
THE SAME	sex*	-0.009	-1.09	-0.031	-4.07	0.003	0.40	-0.013	-1.68	0.013	2.23	-0.032	-3.61	-0.010	-3.49	0.008	3.87
	cage2*	0.034	3.34	-0.019	-1.89	-0.009	-0.99	-0.022	-2.16	-0.003	-0.38	-0.038	-3.17	0.000	-0.05	-0.001	-0.34
	cage3*	0.079	8.13	-0.024	-2.26	-0.049	-4.85	0.021	2.03	0.038	4.93	-0.044	-3.59	-0.002	-0.58	-0.001	-0.43
	cage4*	0.128	13.63	-0.007	-0.52	-0.091	-7.33	0.056	4.62	0.073	9.30	-0.106	-7.22	0.013	4.44	-0.007	-1.58
	cage5*	0.126	11.92	0.023	1.00	-0.098	-4.17	0.078	3.69	0.091	12.47	-0.029	-1.07	0.011	2.84	0.005	1.60
	power2*	-0.012	-1.49	0.059	7.22	0.007	0.93	0.017	2.17	-0.001	-0.21	0.077	8.32	0.010	3.59	0.013	6.50
	power3*	-0.038	-2.92	0.049	3.98	-0.037	-3.04	-0.006	-0.50	0.002	0.16	0.051	3.79	0.014	7.00	0.007	4.79
	tax*	-0.100	-12.15	-0.107	-13.50	0.002	0.30	-0.097	-12.50	-0.048	-7.60	-0.078	-8.44	-0.046	11.05	0.019	8.11
	occ2*	-0.052	-3.53	0.010	0.72	0.019	1.60	-0.016	-1.20	-0.011	-1.04	0.033	2.12	0.016	8.53	0.005	2.14
	occ3*	-0.021	-2.18	-0.013	-1.33	-0.023	-2.57	-0.023	-2.40	-0.004	-0.58	-0.014	-1.27	-0.012	-3.28	0.004	1.43
	linc	-0.021	-3.15	0.050	7.44	-0.006	-0.92	-0.019	-2.90	-0.015	-2.97	0.086	11.01	0.029	9.77	0.009	4.70
	country2*	0.117	12.90	-0.189	-19.38	-0.073	-5.71	-0.156	-14.46	0.108	19.76	-0.190	-13.81	0.012	4.76	-0.110	-9.90
	country3*	0.060	5.69	-0.099	-9.23	0.136	21.86	-0.081	-7.46	-0.040	-4.26	-0.092	-6.89	-0.036	-5.21	-0.028	-3.94
	country4*	0.059	1.89	-0.164	-6.51	-0.147	-4.04	-0.077	-2.28	0.097	20.67	-0.209	-5.88	-0.061	-2.12	0.000	0.05
	country5*	0.066	3.36	-0.107	-5.29	0.065	4.01	-0.038	-1.66	0.060	4.58	-0.058	-2.09	-0.021	-1.62	-0.011	-1.09
	country6*	0.025	2.20	-0.099	-9.29	-0.023	-2.14	-0.095	-8.81	0.069	9.52	-0.110	-8.27	-0.050	-6.58	-0.041	-5.15
	country7*	0.109	12.11	0.044	3.95	0.097	12.66	-0.047	-4.26	0.004	0.45	0.065	5.25	0.019	8.93	-0.003	-0.85

Tab. 3 Oprobit estimation results (marginal effects)

		environment		health		police and law enforcement		education		military and defense		old age pensions		unemployment benefits		culture and arts	
	variable	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z	dy/dx	z
MORE	sex*	0.005	1.09	0.005	3.70	-0.002	-0.40	0.004	1.68	0.008	2.22	0.017	3.60	0.023	3.58	0.025	4.03
	cage2*	-0.020	-3.13	0.003	2.11	0.006	1.01	0.006	2.35	-0.002	-0.39	0.019	3.34	0.000	0.05	-0.003	-0.34
	cage3*	-0.052	-6.89	0.003	2.66	0.030	5.41	-0.006	-1.84	0.024	4.55	0.022	3.86	0.005	0.59	-0.004	-0.44
	cage4*	-0.104	-9.71	0.001	0.56	0.047	9.80	-0.021	-3.60	0.052	7.38	0.044	9.47	-0.037	-3.51	-0.018	-1.81
	cage5*	-0.130	-6.02	-0.005	-0.80	0.041	8.85	-0.038	-2.52	0.088	6.04	0.014	1.19	-0.036	-1.77	0.021	1.08
	power2*	0.007	1.51	-0.012	-5.29	-0.005	-0.92	-0.005	-2.06	-0.001	-0.21	-0.044	-7.67	-0.024	-3.48	0.046	6.90
	power3*	0.018	3.37	-0.013	-2.85	0.022	3.50	0.002	0.52	0.001	0.16	-0.031	-3.35	-0.049	-4.59	0.032	3.12
	tax*	0.052	12.01	0.014	5.80	-0.002	-0.30	0.023	8.95	-0.027	-7.69	0.040	8.50	0.094	14.25	0.067	10.29
	occ2*	0.024	4.46	-0.002	-0.65	-0.014	-1.49	0.004	1.42	-0.006	-1.07	-0.019	-1.95	-0.074	-6.25	0.019	1.64
	occ3*	0.012	2.18	0.002	1.33	0.015	2.58	0.006	2.39	-0.003	-0.59	0.008	1.28	0.027	3.37	0.011	1.43
	linc	0.012	3.14	-0.009	-5.54	0.004	0.92	0.005	2.83	-0.009	-2.97	-0.046	-10.42	-0.066	-11.50	0.027	5.11
	country2*	-0.098	-8.88	-0.053	-5.85	0.038	7.68	-0.012	-1.99	0.101	12.49	0.050	14.14	-0.038	-3.48	-0.127	-17.81
	country3*	-0.040	-4.83	-0.001	-0.36	-0.158	-14.65	0.010	5.63	-0.021	-4.59	0.039	8.72	0.060	6.85	0.178	18.73
	country4*	-0.042	-1.49	-0.060	-2.13	0.042	8.47	0.005	0.74	0.129	5.88	0.027	1.88	0.077	3.40	0.080	2.62
	country5*	-0.048	-2.60	-0.014	-1.39	-0.060	-2.97	0.007	3.51	0.045	3.40	0.025	2.70	0.037	2.06	-0.024	-1.37
	country6*	-0.015	-2.05	-0.001	-0.30	0.015	2.30	0.010	4.22	0.049	7.69	0.044	10.76	0.077	9.12	0.197	20.91
	country7*	-0.085	-8.95	-0.011	-2.93	-0.093	-9.30	0.009	5.96	0.002	0.44	-0.040	-4.58	-0.086	-8.99	-0.008	-0.91
MUCH MORE	sex*	0.008	1.09	0.036	4.07	-0.003	-0.40	0.014	1.68	0.003	2.21	0.024	3.60	0.015	3.54	0.008	3.94
	cage2*	-0.030	-3.38	0.022	1.87	0.009	0.99	0.024	2.13	-0.001	-0.39	0.028	3.10	0.000	0.05	-0.001	-0.34
	cage3*	-0.068	-8.34	0.027	2.22	0.046	4.73	-0.022	-2.06	0.011	4.20	0.033	3.48	0.003	0.59	-0.001	-0.44
	cage4*	-0.109	-13.83	0.008	0.52	0.088	6.86	-0.057	-4.85	0.026	6.13	0.086	6.56	-0.022	-3.68	-0.006	-1.87
	cage5*	-0.108	-10.43	-0.026	-1.04	0.099	3.71	-0.077	-4.04	0.054	4.44	0.022	1.03	-0.020	-1.98	0.008	1.01
	power2*	0.011	1.48	-0.066	-7.38	-0.006	-0.93	-0.019	-2.18	0.000	-0.21	-0.056	-8.46	-0.015	-3.56	0.016	6.36
	power3*	0.035	2.83	-0.053	-4.20	0.034	2.95	0.007	0.49	0.000	0.16	-0.036	-3.97	-0.027	-5.19	0.012	2.87
	tax*	0.092	11.99	0.126	13.39	-0.002	-0.31	0.109	12.32	-0.011	-7.11	0.058	8.28	0.065	12.59	0.024	9.18
	occ2*	0.049	3.37	-0.011	-0.73	-0.017	-1.62	0.018	1.18	-0.003	-1.10	-0.023	-2.20	-0.038	-7.48	0.007	1.56
	occ3*	0.019	2.17	0.015	1.33	0.020	2.56	0.024	2.39	-0.001	-0.59	0.010	1.27	0.017	3.36	0.004	1.42
	linc	0.019	3.16	-0.057	-7.52	0.005	0.92	0.020	2.90	-0.004	-2.94	-0.063	-11.10	-0.042	-11.46	0.009	4.98
	country2*	-0.099	-13.09	0.284	15.16	0.070	5.42	0.210	11.93	0.061	8.84	0.175	11.09	-0.022	-3.82	-0.033	-14.58
	country3*	-0.051	-5.86	0.126	8.34	-0.125	-21.26	0.096	6.84	-0.009	-4.67	0.074	6.32	0.045	5.78	0.098	12.04
	country4*	-0.050	-1.96	0.257	4.61	0.159	3.29	0.095	2.00	0.095	3.65	0.214	4.14	0.071	2.28	0.036	2.03
	country5*	-0.056	-3.48	0.146	4.41	-0.056	-4.04	0.043	1.57	0.023	2.87	0.046	1.93	0.027	1.77	-0.008	-1.47
	country6*	-0.022	-2.24	0.127	8.45	0.021	2.11	0.114	8.03	0.024	6.45	0.090	7.48	0.061	7.29	0.116	13.10
	country7*	-0.092	-12.48	-0.048	-4.13	-0.086	-12.73	0.053	4.05	0.001	0.44	-0.045	-5.53	-0.045	-10.19	-0.003	-0.92

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Tab.4 Choices by the median voter

	country							
public expenditure	Germany	Great Britain	Italy	Ireland	Sweden	Spain	France	EU
environment	more	the same	more	more	more	more	the same	more
health	more	much more	more	more	more	more	more	more
police and law enforcement	more	more	the same	more	the same	more	the same	more
education	more	more	more	more	more	more	more	more
military and defense	less	the same	less	the same	less	less	less	less
old age pensions	the same	more	more	more	more	more	the same	more
unemployment benefits	the same	the same	the same	the same	the same	more	the same	the same
culture and arts	the same	less	the same	the same	the same	the same	the same	the same

Tab.5 Welfare loss in the decentralized and the centralized solutions

decentralized solution								
	country							
public expenditure	Germany	Great Britain	Italy	Ireland	Sweden	Spain	France	EU
environment	88215	91974	75695	5389	12298	42268	85452	401292
health	113806	92465	48634	2845	7584	32262	102174	399770
police and law enforcement	103119	54542	78150	2898	14271	44951	84597	382528
education	134190	44112	58497	4250	11370	36269	76416	365104
military and defense	131455	121799	72891	7638	20896	93176	94790	542644
old age pensions	114689	41710	52140	2756	9584	33536	69332	323747
unemployment benefits	123675	94594	97143	7114	14268	73786	96805	507385
culture and arts	140028	69592	90616	5463	15993	70587	107872	500151
sum of public expenditures	949178	610787	573766	38352	106263	426835	717439	3422621
centralized solution								
	country							
public expenditure	Germany	Great Britain	Italy	Ireland	Sweden	Spain	France	Europe
environment	88215	101630	75695	5389	12298	42268	108891	434386
health	113806	41901	48634	2845	7584	32262	102174	349206
police and law enforcement	103119	54542	193480	2898	16022	44951	138540	553552
education	134190	44112	58497	4250	11370	36269	76416	365104
military and defense	131455	220597	72891	18442	20896	93176	94790	652247
old age pensions	115730	41710	52140	2756	9584	33536	110351	365806
unemployment benefits	123675	94594	97143	7114	14268	78373	96805	511972
culture and arts	140028	174218	90616	5463	15993	70587	107872	604777

Table A.1 Description of variables

Sex	sex*	1 = male
		2 = female
Age	cage_1*	1 = 18-30
	cage_2*	2 = 31-45
	cage_3*	3 = 46-60
	cage_4*	4 = 60-75
	cage_5*	5 = > 75
Occupational status	occ_1*	1 = employee
	occ_2*	2 = self-employed
	occ_3*	3 = other (unemployed, student, retired, housewife, etc.)
Log of monthly family income	linc	Log of the repsondent's income minus log of the average income in the respondent's country
Country	country_1*	1 = Germany
	country_2*	2 = Great Britain
	country_3*	3 = Italy
	country_4*	4= Ireland
	country_5*	5 = Sweden
	country_6*	6 = Spain
	country_7*	7 = France
Question: "Does the government have too much power or too little power?"	power_1*	1 = "Far too much power/Too much power"
	power_2*	2 = "About the right amount of power"
	power_3*	3 = "Too little power/Far too little power"
Question: "If the government had a choice between reducing the or spending more on social services, which do you think it should do?"	tax*	1 = "Reduce taxes, even if this means spending less"
		2 = "Spend more, even if this means higher taxes"

(*) dummy variable