Evolution over time of the determinants of preferences for redistribution and the support for the welfare state

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Abstract

The objective of this article is to analyse the determinants of preferences for redistribution in Spain both at an aggregate and regional level. Using country level data, we put to the test the Alesina and Angeletos' (2005) hypothesis, the strong and positive relationship between the 'belief that luck determines income' and the support for redistributive policies. As an innovative contribution, we contrast this hypothesis using a set of panel data models with *regional* and *time* fixed effects. Our main finding is the existence of a structural change in preferences formation for redistribution in Spain between 1995 and 2007. Furthermore, the empirical results provide some evidence suggesting that (1) the belief that society is unfair have a moderate effect on the individuals' preferences for redistribution and (2) regional beliefs in Spanish regions are not equally important when determining demand for redistribution.

Keywords

Fairness, redistribution of income, aggregate and regional beliefs, welfare state

JEL Classification: D31, E62, H2, P16

I. Introduction

Income inequality has come to take up a central place among the concerns of economic and social policies. The last financial crisis has reinforced this trend. For example, a recent survey for the World Economic Forum meeting at Davos pointed to inequality as the most pressing problem of the coming decade (alongside fiscal imbalances).

A demand-side analysis of the problem of income distribution is especially interesting if we assume that, in a democracy, the electorate's preferences should have a significant influence on policy decisions. Indeed, understanding the role of

governments in the economies of modern democracies requires understanding the social attitudes towards income inequality, redistribution and the level of responsibility the government should take to ensure that everyone is provided for. For instance, if the degree of tax progressivity and the budgetary weight of social spending (i.e. the standard mix of redistributive policies) reflects the constituencies' preferences, the analysis of the determinants of those preferences contributes to explaining the different levels and forms of redistribution across countries or regions within a country.

Traditionally in economics, models that explain preferences for redistribution focus on three types of factors[1]1 For a literature review of the factors influencing preferences see Akkoyunlu *et al*. (2009 Akkoyunlu, S., Neustadt, I. and Zweifel, P. (2009) Why does the amount of income redistribution differ between United States and Europe? The Janus Face of Switzerland. SOI Working Paper No. 0810, University of Zurich, Socioeconomic Institute, Zurich) and Alesina and Giulano (2011).View all notes: economic (income, income inequality, earnings mobility, openness of the economy, demand of insurance by risk adverse individuals ...), political (electoral system/electoral rules, government, political parties ...) and behavioural (beliefs, judgement values, social norms ...). Since attitudes towards issues such as the optimal level of redistribution are largely a matter of normative belief, an analytical framework considering only economic factors is insufficient to explain the formation of this type of preferences. Therefore, models which are only based on the assumption of agents motivated by narrowly defined self-interest are not successful in predicting demand for redistribution. In particular, behavioural economics finds evidence that individuals appear to be only imperfectly self-interested.

The above mentioned value judgments include beliefs about how much of high incomes are due to good luck or whether high-income individuals 'deserve' their incomes. Within the framework of the academic literature dealing with preferences for redistribution, Alesina and Angeletos (2005 Alesina, A. and Angeletos, G.-M. (2005) Fairness and redistribution, The American Economic Review, 95, 960–80., (henceforth AA) concluded that, by using data at a national level, there is a strong and significant effect that those societies which believe that individual efforts determine income will choose low redistribution policies and low taxes. In order to support their theory empirically, they find a strong and significant positive effect between the beliefs that luck determines income and the probability of being leftist. More left-wing individuals are more pro-distribution.

The main objective of this article is twofold: (1) to identify the factors determining preferences for redistribution in Spain, both at an aggregate and regional level and (2) to test the existence of a structural change in those preferences formation between 1995 and 2007. We are especially interested in knowing to what extent individual preferences for redistribution have a non-economic substrate and, particularly, in verifying whether the belief that society is unfair has a significant positive effect on the support for redistribution.

In order to address the above mentioned research question(s) we test the same hypotheses as AA on fairness and preferences for redistribution, but we go further and our results clearly differ from those obtained by these authors. Particularly, the contribution of the present article to the empirical literature on determinants for individual preferences for redistribution can be summarized as follows.

First, we want to find out if the relationship also holds at a regional level in Spain and if all regional beliefs in all regions are equally important when determining demand for redistribution. In order to do that, we introduce both *belief-fixed effects* (from the best of our knowledge, we believe that we are the first in the literature to do so) and regional-fixed effects (following García-Valiñas *et al*. (2008)) in the analysis. Considering data at a regional level allows us to uncover aspects that would otherwise be hidden if we aggregate at a national level. The effects of aggregation in a time series are well-known in the literature (see e.g. Rossana and Seater, 1995 Wooldridge, J. M. (2008) Introductory Econometrics: A ModernApproach, 4th edn, South-Western College, Mason, OH.).

Second, in this article we also analyse the evolution over time of the determinants of preferences for redistribution. For example, Fatás (1997 Fatás, A. (1997) EMU: countries or regions? Lessons from theEMS experience, European Economic Review*,* 41, 743–51) argues that correlations within countries have been decreasing over time while cross-country correlations have increased, and we may expect changes over time also in the function of preferences for distribution.

Third, AA use the variable 'being left on the political spectrum' as a proxy of the preferences for redistribution. Additionally, we find out if the results when using the AA specification about the determinants on ideological beliefs can also be translated into determinants in preferences of income equality and government redistribution in Spain.

Spain is a good country to consider for a number of reasons. *First*, the problem of inequality of income distribution and its evolution over time is relevant. According to the latest data published by Eurostat, Spain stands out for its high–income inequality compared to other European countries (the highest in the eurozone). The Gini index value in 2010 (33.9) lays significantly above the European Union average in 2011 and continued to rise. *Second*, Spain is not a homogeneous country. It was a highly centralized state turned into a very decentralized one in which there are important cultural, linguistic and historical differences across regions. Therefore, it is interesting to analyse to what extent heterogeneity among individual preferences could become a driving force of decentralization. This idea has been developed in demand-driven median-voter type models (Alesina and Spolaore, 1997 Alesina, A. and Spolaore, E. (1997) On the number and size of nations, Quarterly Journal of Economics*,* 112, 1027–56.; Panizza, 1999 Piketty, T. (1995) Social mobility and redistributive politics, The Quarterly Journal of Economics*,* 110, 551–84. *Finally*, if there is heterogeneity of preferences across regions within the country, hardly a centralized policy could meet citizens' demands. In the Spanish case, some of the main redistribution policies are in the hands of the central government and some subnational governments claim to be

more capable than the central administration of meeting their constituencies' preferences and demands for public goods and services. For this kind of reasons, a special motivation for this research comes from its policy relevance, because it is tied to new facts or trends, and produced in a timely way that can impact policy debate.

The structure of the article is as follows. In Section II, we present the theoretical framework, the data and descriptive statistics. Section III contains the main results. Finally, Section IV concludes. A definition of the variables and the models that are used in the article is given in Appendix 1, and all tables are collected in Appendix 2.

II. Analytical Framework, Data and Descriptive Statistics

In general terms, the analytical framework that offers a reasonable explanation to the positioning of a society on the fairness of market outcomes and the role of government in the economy, is provided by a growing literature that has addressed the determinants of demand for redistribution.[2]2 Benabou and Ok (2001), Alesina and Angeletos (2005 Alesina, A. and Angeletos, G.-M. (2005) Fairness and redistribution, The American Economic Review*,* 95, 960–80.) and Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity*,* 2, 187–277. View all notes These factors are grouped into three main categories: economic, political and behavioural. In our case, taking into account the objective of this article, we will focus primarily on the first two.

A priori, income levels and its interpersonal distribution can be good predictors of individual attitudes towards redistribution. In principle, as indicated Romer (1975 Rossana, R. J. and Seater, J. J. (1995) Temporal aggregation and economic time series, Journal of Business and Economic Statistics*,* 13, 441–51.,) and Meltzer and Richard (1981 Neher, F. (2012) Preferences for redistribution around the world, School of Business & Economics Discussion Paper: Economics, No. 2012/2. Available at http://hdl.handle.net/10419/55522 (accessed 26 February 2013), individuals with higher (lower) incomes have a lower (higher) probability of supporting redistribution and vice versa. In particular, Richard and Meltzer base their reasoning on the median–voter theorem. Technically, a higher level of market-generated inequality implies a greater distance between the mean and the median income (before taxes and transfers). In this situation the latter will be considerably below the first. The lower the median income in relation with the average, the more profit the individual or the family situated in the median of redistributive policies will get. This individual or family will receive transfers that exceed their contribution via tax burden.

Furthermore, according to Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity*,* 2, 187–277.), as occurs with redistribution of the richest to the poorest, one would expect the latter to have a more favourable stance and the first to pose greater opposition. This argument connects with an approach that is widely accepted and which emphasizes the influence of individual characteristics (personal circumstances) on attitudes towards redistributive

policies. This is a version of what has been called the 'private interest hypothesis', which assumes that those who are or may potentially benefit from the programme of the welfare state are more likely to report a more favourable opinion on such policy. Recently, Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931.) provide a literature review of what determines the preferences of individuals for redistribution, and among other issues, they empirically confirm facts such as in general, in the United States of America, blacks, the less rich people, women (in the United States of America, women are more left-wing than men – see e.g. Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity, 2, 187–277.), the less educated people and left-wing people are more in favour of redistribution.

Other approaches focus their explanations not only on the characteristics of income distribution but also in the social and cultural determinants of the process of preferences formation. Then, the initial hypothesis proposed by Hirschman and Rothschild (1973 Iglesias-Fernández, C., Llorente-Heras, R. and Dueñas-Fernández, D. (2009) La Segregación Laboral for Razón de Género en España: In Análisis Regional, VIII Jornadas de Economía Laboral.) and confirmed later by Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity, 2, 187–277.), highlights that expectations of social mobility are crucial to reduce the individuals will to redistribute. However, this explanation continues to be insufficient since those individuals that have moved up in their social scale do not tend to show a reduction in their redistribution demand (see Alesina and Giuliano, 2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931). On the other hand, contractualism tends to interpret redistribution policies as a demand for personal reassurances. However, experimental results show that risk aversion is very inferior to the rawlsian proposal of the maximin rule (see Beck, 1994 Beck, J. (1994) An experimental test of preferences for the distribution of income and individual risk aversion, Eastern Economic Journal, 20, 131–45. ; Cabrales *et al*., 2012 Cabrales, A., Nagel, R. and Rodríguez-Mora, J. V. (2012) It is hobbes, not rousseau: an experiment on voting and redistribution, Experimental Economics, 15, 278–308.).

Without doubt, both approaches are linked to the existence of a justice idea, i.e., individual perceptions are based on a certain subjective point of view of what is fair in terms of what they deserve (see Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931.)). In more detail, the redistribution will is linked to the existence of randomness of income distribution that is not linked to effort, since lack of it is related to the explained primacy of effort. In this way, more equality due to luck seems more desirable than when it is derived from effort. Obviously, the formation of these type of beliefs can be very attached to personal history (see Piketty, 1995 Rey-Biel, P., Sheremeta, R. and Uler, N. (2011) (Bad) Luck or (Lack of) Effort?: comparing social sharing norms between US and Europe, Barcelona GSE Working Papers Series

No. 584, Barcelona. [Google Scholar]) or characteristics that are proper of cultures where individuals are more or less risk averse (see Alesina and Glaesser, 2004; Benabou and Tirole, 2005; Rey-Biel *et al*., 2011 Romer, T. (1975) Individual welfare, majority voting, and the properties of a linear income tax, Journal of Public Economics, 4, 163–85.).

Dataset and descriptive statistics

The individual level data is taken from the World Values Survey (WVS) and the European Values Survey (EVS). The WVS is probably one of the most well–known surveys that have been carried out to analyse in practice issues of social welfare. Examples of papers that have used this survey at an aggregate level by considering countries as individual units are Guiso *et al*. (2003 Hirschman, A. O. and Rothschild, M. (1973) The changing tolerance for income inequality in the course of economic eevelopment, The Quarterly Journal of Economics, 87, 544–66.), (religion issues), Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity, 2, 187–277.) and Alesina and Angeletos (2005 Alesina, A. and Angeletos, G.-M. (2005) Fairness and redistribution, The American Economic Review, 95, 960–80.) (preferences for redistribution in relation to mean income), Fortin (2005 García-Valiñas, M. A., Fernández-Llera, R. and Torgler, B. (2008) More income equality or not? An empirical analysis of individuals' preferences for redistribution, Discussion Paper and Working Paper Series #226, Queensland University of Technology, School of Economics and Finance, Brisbane, QLD.) (gender role attitudes and work values on women's labour-market outcomes), Blekesaune (2007 Blekesaune, M. (2007) Economic conditions and public attitudes to welfare policies, European Sociological Review, 23, 393–403.) (public opinions towards welfare state policies), Landier *et al*. (2008 Luttmer, E. F. P. (2001) Group loyalty and taste for redistribution, Quarterly Journal of Economics, 109, 500–28.) (analysing pro-capitalism issues) and Fischer (2008 Fong, C., Bowles, S. and Gintis, H. (2006) Strong reciprocity and the welfare state, in Handbook of the Economics of Giving, Altruism and Reciprocity, (Eds.) S. -C. Kolm and J. M. Ythier, Elsevier, Amsterdam, Vol. 2.) (effects of competition in trust).

The WVS Network provides a harmonized file of European data extending over five survey waves carried out around 1981, 1990, 1995, 2000 and 2005. We have data for Spain for the waves of years 1980, 1990, 1995, 2000 and 2007, corresponding to the most recent periods that are available nowadays in the WVS. However, we can only get all the data we need to carry out the analysis of AA for 1995 and 2007 in Spain (see Appendix 1 for more details about the availability of the data and a list of all the variables we use) and that is why we only study those 2 years. More specifically, we do not have access to any of the variables for 1980, VAR5 in 1990 and VAR1 for the wave of 2000 in Spain.

Those individuals where at least one of the variables show a 'no-answer' were removed from the sample. In 1995, we have originally 1211 individuals, and we are left with 433 individuals.[3]3 That implies that we may have some issues with the sample representativeness. Some methods to guarantee the

representativeness involve the use of weights (see for example Ayala *et al*., 2006 Ayala, L., Navarro, C. and Sastre, M. (2006), La Attrition en el Panel de Hogares de la Unión Europea: ¿Cómo influye en la Movilidad de Ingresos?, XIII Encuentro de Economía Poíltica, Almería.); however, in our case it is not obvious how those weights may be implemented. We have checked that the descriptive statistics of all variables did not change substantially when we have removed from the sample those individuals where at least one of the variables show a 'no-answer'. Even so, we acknowledge that our results mainly for 1995 may be affected by sample selection issues.View all notes For 2007, we start with a sample of 1200 individuals and after removing those individuals without an answer, we are left with 899 individuals.[4]4 Tables with the descriptive statistics of all variables (including those that we need to analyse the setting of García-Valiñas *et al*. (2008) and Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931.,) can be obtained from any of the authors upon request.View all notes From descriptive statistics of all variables in 1995, we note that, for example, VAR6 corresponds to 98.9% of white respondents in Spain that are white. This reflects that the population situation in Spain is very different to the setting of AA, and it explains why for example in our case, variables such as race (VAR6) are not statistically relevant in our analysis when we introduce them into the model. VAR6 is not available in the WVS for Spain in 2007, but given the demographic structure of Spain where most of the population is white, we argue that this variable is not relevant for the Spanish setting.

III. Empirical Analysis and Results

Empirical strategy

First, we rely on the specification given in Table 2 in AA (page 964) in which they find a strong and positive relationship between the 'belief that luck determines income' on the 'probability of being leftist'.

Table 1. The effect of the belief that luck determines income on individual political orientation in Spain in 1995

Dependent variable: being left on the political spectrum					
Models	1	2	3	4	5
Aggregate belief					
VAR1	**–0.033 (–0.41)**	**–0.033 (–0.41)**	**–0.010 (–0.12)**	**–0.010 (–0.12)**	–
Geography/income					
VAR2	–	0.318 (0.41)	–	–	–
VAR3	–0.013 (–0.94)	–0.012 (–0.87)	–0.001 (–0.07)	–	–
VAR4	0.020 (1.92)*	0.020 (1.91)*	0.018 (1.72)*	0.021 (2.10)**	0.021 (2.10)**
Sociodemography					
VAR5	**–0.032 (–2.88)*** **	**–0.033 (–2.90)*** **	**–0.031 (–2.68)*** **	**–0.026 (–2.81)*** **	**–0.026 (–2.82)*** **
VAR6	–0.112 (–0.55)	–0.124 (–0.60)	–0.088 (–0.41)	–	–
VAR7	–0.038 (–0.57)	–0.038 (–0.57)	–0.049 (–0.73)	–	–
VAR8	–0.019 (–1.10)	–0.018 (–1.05)	–0.018 (–1.05)	–0.030 (–1.98)**	–0.030 (–2.00)**
VAR9	–0.057 (–1.26)	–0.058 (–1.27)	–0.042 (–0.91)	–	–
VAR10	0.051 (0.53)	0.046 (0.47)	0.041 (0.40)	–	–
VAR11	0.013 (0.09)	0.014 (0.10)	–0.068 (–0.48)	–	–
VAR12	0.069 (0.83)	0.067 (0.80)	0.038 (0.45)	–	–
VAR13	0.118 (1.64)	0.116 (1.60)	0.074 (1.00)	–	–
VAR14	–0.032 (–0.42)	–0.035 (–0.47)	–0.046 (–0.62)	–	–
VAR15	0.011 (0.15)	0.008 (0.11)	–0.023 (–0.33)	–	–
Constant	0.950 (4.15)***	0.862 (2.77)***	0.958 (3.96)***	0.807 (9.86)***	0.803 (10.74)***
R^2	0.05	0.05	0.09	0.05	0.07
Models	6	7	8	9	10
Aggregate belief					
VAR1	**–0.099 (–1.04)**	**–0.074 (–0.85)**	**–0.078 (–0.90)**	–	–
Geography/income					

Dependent variable: being left on the political spectrum					
VAR2	–	–	–	–	–
VAR3	–0.005 (–0.30)	–	–	–	–
VAR4	0.014 (1.24)	0.017 (1.69)*	0.021 (2.04)**	–	–
Sociodemography					
VAR5	**–0.030 (–2.64)*** **	**–0.026 (–2.76)*** **	**–0.028 (–2.99)*** **	**–0.023 (–2.56)** **	**–0.020 (–2.24)** **
VAR6	–0.107 (–0.50)	–	–	–	–
VAR7	–0.058 (–0.86)	–	–	–	–
VAR8	–0.018 (–1.02)	–0.030 (–1.99)**	–0.030 (–1.95)*	–0.029 (–1.90)*	–
VAR9	–0.053 (–1.14)	–	–	–	–
VAR10	0.060 (0.60)	–	–	–	–
VAR11	–0.067 (–0.47)	–	–	–	–
VAR12	0.054 (0.63)	–	–	–	–
VAR13	0.090 (1.21)	–	–	–	–
VAR14	–0.040 (–0.54)	–	–	–	–
VAR15	–0.020 (–0.28)	–	–	–	–
Constant	1.061 (4.33)***	0.854 (10.03)***	0.827 (9.72)***	0.884 (14.53)***	0.797 (19.80)***
R-squared	0.03	0.07	0.05	0.04	0.03

Models	1	2	3	4	5
Regional fixed effects					
VAR16AN	–	–	–0.004 (–0.05)	–	–
VAR16AR	–	–	–0.245 (–1.66)*	–	–
VAR16AS	–	–	0.043 (0.30)	–	–
VAR16B	–	–	–0.063 (–0.43)	–	–
VAR16CAT	–	–	0.024 (0.25)	–	–
VAR16CANA	–	–	–0.031 (–0.25)	–	–

Dependent variable: being left on the political spectrum					
VAR16CANT	–	–	–0.220 (–1.02)	–	–
VAR16CASLE	–	–	–0.082 (–0.76)	–	–
VAR16CASLA	–	–	–0.070 (–0.52)	–	–
VAR16E	–	–	0.075 (0.50)	–	–
VAR16G	–	–	0.004 (0.04)	–	–
VAR16R	–	–	–0.074 (–0.25)	–	–
VAR16MA	–	–	**–0.163 (–1.82)***	**–0.150 (–2.44)****	**–0.151 (–2.44)****
VAR16MU	–	–	–0.162 (–1.20)	–	–
VAR16NA	–	–	–0.329 (–1.85)*	–0.314 (–1.96)*	–0.314 (–1.96)*
VAR16PVAS	–	–	–0.390 (–2.33)**	–0.385 (–2.55)**	–0.385 (–2.56)**
Regional belief–fixed effects					
VAR1MA	–	–	–	–	–
VAR1NA	–	–	–	–	–
VAR1PVAS	–	–	–	–	–
Models	6	7	8	9	10
Regional fixed effects					
VAR16AN	–0.014 (–0.17)	–	–	–	–
VAR16AR	–0.256 (–1.74)*	–	–	–	–
VAR16AS	0.025 (0.17)	–	–	–	–
VAR16B	–0.083 (–0.56)	–	–	–	–
VAR16CAT	0.002 (0.02)	–	–	–	–
VAR16CANA	–0.030 (–0.24)	–	–	–	–
VAR16CANT	–0.217 (–1.01)	–	–	–	–
VAR16CASLE	–0.094 (–0.87)	–	–	–	–
VAR16CASLA	–0.090 (–0.68)	–	–	–	–

Dependent variable: being left on the political spectrum					
VAR16E	0.056 (0.38)	–	–	–	–
VAR16G	–0.013 (–0.13)	–	–	–	–
VAR16R	–0.053 (–0.18)	–	–	–	–
VAR16MA	**–0.374 (–2.87)*** **	**–0.317 (–2.95)*** **	**–0.298 (–2.76)*** **	**–0.278 (–2.72)*** **	**–0.267 (–2.62)*** **
VAR16MU	–0.172 (–1.28)	–	–	–	–
VAR16NA	–0.391 (–0.84)	–0.320 (–0.71)	–	–	–
VAR16PVAS	–0.193 (–0.54)	–0.195 (–0.57)	–	–	–
Regional belief–fixed effects				–	–
VAR1MA	**0.478 (2.23)** **	**0.392 (1.91)***	**0.383 (1.85)***	**0.371 (2.00)** **	**0.359 (1.93)***
VAR1NA	0.125 (0.12)	–0.002 (–0.00)	–	–	–
VAR1PVAS	–0.483 (–0.65)	–0.456 (–0.63)	–	–	–

Notes: We report OLS estimates with *t*-statistics in parenthesis (*significant at 10%, **significant at 5% and ***significant at 1%). As in AA, Probit and Logit also give similar results than OLS.

Table 2. The effect of the belief that luck determines income on individual political orientation in Spain in 2007

Dependent variable: being left on the political spectrum					
Models	1	2	3	4	5
Aggregate belief					
VAR1	**0.126 (1.83)***	**0.121 (1.75)***	**0.050 (0.72)**	**0.070 (1.03)**	--
Geography/income					
VAR2	--	–1.299 (–1.21)	--	--	--
VAR3	**–0.044 (–4.40)*****	**–0.045 (–4.48)*****	**–0.053 (–5.11)*****	**–0.049 (–5.32)*****	**–0.048 (–5.30)*****
VAR4	–0.004 (–0.60)	–0.003 (–0.47)	–0.002 (–0.23)	--	--
Socio-demography					
VAR5	0.012 (1.55)	0.012 (1.49)	0.011 (1.39)	--	--
VAR6	--	--	--	--	--
VAR7	0.012 (0.36)	0.016 (0.46)	0.016 (0.46)	--	--
VAR8	–0.018 (–1.36)	–0.019 (–1.40)	–0.019 (–1.40)	--	--
VAR9	0.032 (1.10)	0.032 (1.11)	0.025 (0.89)	--	--
VAR10	–0.230 (–2.30)**	–0.220 (–2.18)	–0.160 (–1.55)	--	--
VAR11	**0.204 (3.25)*****	**0.205 (3.28)*****	**0.208 (3.36)*****	**0.259 (4.92)*****	**0.260 (4.93)*****
VAR12	**0.173 (3.22)*****	**0.174 (3.23)*****	**0.214 (4.00)*****	**0.261 (5.62)*****	**0.263 (5.67)*****
VAR13	**0.128 (2.56)****	**0.126 (2.52)****	**0.126 (2.56)****	**0.160 (3.54)*****	**0.162 (3.59)*****
VAR14	**0.124 (2.48)****	**0.123 (2.46)****	**0.126 (2.57)*****	**0.146 (3.08)*****	**0.148 (3.11)*****
VAR15	**0.146 (2.73)*****	**0.145 (2.72)*****	**0.156 (3.00)*****	**0.162 (3.17)*****	**0.163 (3.19)*****
Constant	0.825 (9.82)***	1.141 (4.15)***	0.810 (8.68)***	0.759 (14.05)***	0.785 (16.41)***

Dependent variable: being left on the political spectrum					
R^2	0.06	0.06	0.13	0.11	0.11
Models	6	7	8	9	10
Aggregate belief					
VAR1	**0.067 (0.82)**	**0.084 (1.23)**	**0.076 (1.11)**	--	--
Geography/income					
VAR2	--	--	--	--	--
VAR3	**–0.053 (–5.10)*** **	**–0.038 (–4.18)*** **	**–0.039 (–4.35)*** **	**–0.038 (–4.17)*** **	**–0.039 (–4.33)*** **
VAR4	–0.002 (–0.26)	**--**	**--**	--	--
Socio-demography					
VAR5	0.011 (1.39)	**--**	**--**	**--**	**--**
VAR6	--	--	--	--	--
VAR7	0.019 (0.53)	--	--	--	--
VAR8	–0.019 (–1.42)	**--**	**--**	**--**	--
VAR9	0.027 (0.93)	--	--	--	--
VAR10	–0.159 (–1.54)	–0.210 (–2.14)**	--	–0.209 (–2.08)**	--
VAR11	**0.207 (3.34)*** **	**0.258 (4.85)*** **	**0.257 (4.82)*** **	**0.259 (4.86)*** **	**0.258 (4.83)*** **
VAR12	**0.215 (4.00)*** **	**0.235 (5.05)*** **	**0.235 (5.04)*** **	**0.239 (5.12)*** **	**0.238 (5.11)*** **
VAR13	**0.124 (2.50)** **	**0.163 (3.58)*** **	**0.160 (3.52)*** **	**0.166 (3.65)*** **	**0.163 (3.58)*** **
VAR14	**0.124 (2.52)** **	**0.139 (2.91)*** **	**0.140 (2.92)*** **	**0.141 (2.94)*** **	**0.142 (2.96)*** **
VAR15	**0.155 (2.97)*** **	**0.154 (2.97)*** **	**0.156 (3.00)*** **	**0.155 (3.00)*** **	**0.157 (3.03)*** **
Constant	0.803 (8.46)***	0.775 (12.05)***	0.698 (13.07)***	0.804 (13.44)***	0.726 (15.52)***

Dependent variable: being left on the political spectrum					
R^2	0.13	0.09	0.08	0.07	0.09
Models	1	2	3	4	5
Regional fixed effects					
VAR16AN	--	--	0.040 (0.73)	--	--
VAR16AR	--	--	–0.095 (–0.97)*	--	--
VAR16AS	--	--	0.133 (1.45)	--	--
VAR16B	--	--	0.135 (1.30)	--	--
VAR16CAT	**--**	**--**	**0.235 (4.33)*** **	**0.209 (5.41)*** **	**0.214 (5.56)*** **
VAR16CANA	--	--	0.095 (0.89)	--	--
VAR16CANT	--	--	–0.178 (–1.00)	--	--
VAR16CASLE	--	--	0.069 (1.01)	--	--
VAR16CASLA	--	--	–0.181 (–2.32)**	–0.219 (–3.22)***	–0.224 (–3.30)***
VAR16E	--	--	0.033 (0.29)	--	--
VAR16G	--	--	–0.137 (–1.96)**	–0.184 (–3.24)***	–0.178 (–3.15)***
VAR16R	--	--	–0.004 (–0.02)	--	--
VAR16MA	--	--	0.024 (0.43)	--	--
VAR16MU	--	--	–0.140 (–1.56)	--	--
VAR16NA	--	--	0.386 (2.74)***	0.364 (2.69)***	0.374 (2.77)***
VAR16PVAS	--	--	0.105 (1.43)	--	--
Regional belief–fixed effects					
VAR1CAT	--	--	--	--	--

Dependent variable: being left on the political spectrum					
VAR1CASLA	--	--	--	--	--
VAR1G	--	--	--	--	--
VAR1NA	--	--	--	--	--
Models	6	7	8	9	10
Regional fixed effects					
VAR16AN	0.039 (0.71)	--	--	--	--
VAR16AR	–0.095 (–0.98)	--	--	--	--
VAR16AS	0.132 (1.43)	--	--	--	--
VAR16B	0.133 (1.27)	--	--	--	--
VAR16CAT	**0.241 (2.50)****	**0.228 (5.91)*****	**0.230 (5.94)*****	**0.233 (6.07)*****	**0.234 (6.09)*****
VAR16CANA	0.096 (0.89)	--	--	--	--
VAR16CANT	–0.177 (–1.00)	--	--	--	--
VAR16CASLE	0.070 (1.01)	--	--	--	--
VAR16CASLA	–0.170 (–1.16)	--	--	--	--
VAR16E	0.034 (0.29)	--	--	--	--
VAR16G	0.001 (0.01)	--	--	--	--
VAR16R	–0.001 (–0.01)	--	--	--	--
VAR16MA	0.023 (0.41)	--	--	--	--
VAR16MU	–0.138 (–1.53)	--	--	--	--
VAR16NA	0.563 (0.61)	--	--	--	--
VAR16PVAS	0.104 (1.41)	--	--	--	--

Dependent variable: being left on the political spectrum						
Regional belief– fixed effects					--	--
VAR1CAT	–0.016 (–0.09)	--	--	--	--	--
VAR1CASLA	–0.033 (–0.09)	--	--	--	--	--
VAR1G	–0.288 (–0.82)	--	--	--	--	--
VAR1NA	–0.325 (–0.20)	--	--	--	--	--

Note: We report OLS estimates with *t*-statistics in parenthesis (*significant at 10%, **significant at 5% and ***significant at 1%). As in AA, Probit and Logit also give similar results than OLS.

In order to test and to extend the analysis of AA to Spain, our basic model is specified as follows: $\mathrm{DEP}_{ijt} = \alpha + \lambda X_{ict} + \gamma_c J + \delta_t T + \varepsilon_{ict}$

where DEP$_{ijt}$ is the preference for redistribution of individual *i* in region *j* at period *t* and it depends on a set of economic and socioeconomic control variables $X_{ict}$and region *J* and time *T* fixed effects.[5]5 A more detailed description of the variables can be seen in Appendix 1. A very similar specification can be found in Neher (2012 Panizza, U. (1999) On the determinants of fiscal centralization: theory and evidence, Journal of Public Economics*,* 74, 97–139.).View all notes

The dependent variable corresponds to 'Being left on the political spectrum'. It answers the question at the aggregate (all regions) level in Spain: 'In political matters, people talk of left and right. How would you place your views on this scale, generally speaking?' This choice of this variable as proxy of demand for redistribution can be justified because liberals and conservatives tend to disagree about the role of luck in financial success, the former thinking it plays a very big role, the latter thinking it plays a small role: that instead financial success is largely attributable to talent and hard work.

In our case, using the information on the ideological self-positioning of individuals, we come across some interesting facts about the link between ideology and the demand for redistribution. In fact, in the Spanish case a clear correspondence is detected between leftist ideology and greater preference for equality in the distribution of income and, consequently, for the implementation of redistributive policies.

However, in order to verify the robustness, we extend the AA (2005) model, estimating two additional models in which the dependent variables are the most commonly used in the literature as proxy for preferences for redistribution. First, following, Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931.) we use the variable 'preferences for government redistribution' (VAR17 in our notation) as a dependent variable. Second, we also consider preferences for income inequality, which are interpreted as preferences for redistribution. For instance, García-Valiñas *et al*. (2008) use the variable 'preferences for income equality' (VAR17* in our notation) instead of 'being leftist' (i.e. DEP) as the dependent variable.

In order to interpret the values of these variables, note that they reflect how the individual place his views on a scale in which 1 means he agrees completely with the statement that incomes should be made more equal (VAR 17*) or the government should take more responsibility to ensure that everyone is provided for (VAR17), 10 means you agree completely with the statement that we need larger income differences as incentives for individual effort (VAR17*, people should take more responsibility to provide for themselves (VAR17).

Initially, we use the same set of independent variables as AA. Individual belief that luck determines income (VAR1) corresponds to the answer to the question: 'In the long run, hard work usually brings a better life. Or, hard work does not generally bring success;

it's more a matter of luck and connections'. This variable measures the belief in the relation between hard work and success, i.e. the fairness of the distributive system.

As income variables we introduce income (VAR3) and income distribution (VAR2) proxied by the 'Gini Index' to characterize the inequality. In order to control sociodemographic characteristics of individuals, we include as independent variables the most common used in the literature addressing preferences for redistribution: city population (VAR 4), years of education (VAR5), race (VAR6), marital status (VAR7), number of children (VAR8), gender (VAR9), national identity (VAR10) and age (VAR11 to VAR15)

In addition to the above mentioned variables, we incorporate a new variable that is not included in AA. VAR16: 'Region where the survey was carried out' in Spain. This allows us to introduce regional-fixed effects (for Spain). The regional fixed effect in a specific region indicates the relevance of a strong right/left-wing group in that region. We argue that these regional–fixed effects need to be incorporated into the model of AA in countries with characteristics such as those in Spain, where regions can be very heterogeneous from the socioeconomic point of view.

Furthermore, the existence of regional beliefs fixed effect in a region reflects that regional beliefs on the role of luck and effort in that region are representative of the political orientation and the attitudes towards redistribution policies. In order to introduce these belief-fixed effects in the analysis, we have created several variables that were not used in AA. For example, VAR1MA represent the iteration effect of the belief that luck determines income (VAR1) with the regional–fixed effect in Madrid (VAR16MA).

To account for unobserved cultural determinants, as a robustness check, in our extension of the model of AA we also consider the specification given in table 7 in Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931.) to include in all regressions regional–fixed effects and regional belief-fixed effects in Spain.

Finally, we also estimated a panel data setting where time dummies were introduced as time fixed effects, and the results that are presented here for each of the waves (1995 and 2007) were robust to that.

Discussion of results

We provide now detailed results we obtained for 1995 and 2007. All results have been obtained using STATA 11.0. Tables 1 and 2 show the estimation results, by ordinary least squares (OLS), with *t*-statistics in parenthesis. To confirm the robustness of our results, we consider the ten model specifications described in Appendix 1 for 1995 (in order to develop the analysis for Spain in 2007, we continue with the same procedure as in 1995 and with the same ten models).

Year 1995

From Models 1, 2 and 3, we can see how the individual belief that luck determines income (VAR1) does not show a statistically significant relationship with being left on the political spectrum (DEP). The variables that show statistically significant relationships are city population (VAR4) and years of education (VAR5). Additionally, from Models 1, 2 and 3 we identify the main regions to take into account in relation to the fixed effects (Madrid, Navarra and País Vasco).

In Model 4, we find that variables such as age group, sex and marital status are not relevant in Spain. City population, years of education and the number of children are the most important issues. In Model 4, we can see how the signs of the point estimates of these three variables are the same for those variables that are in common with the results in AA (table 2, p. 964); the only difference once again being that VAR1 does not show a statistically significant relationship with DEP in our case. Moreover, we observe how in Madrid, Navarra and País Vasco there are statistically significant regional–fixed effects. This shows that in those regions there were stronger right–wing beliefs than in the rest of Spain. The evidence in Madrid is even stronger than in Navarra and País Vasco. This evidence suggests that regional beliefs in Madrid are representative of the political orientation and the attitudes towards redistribution. Particularly, the negative estimated sign, supports the hypothesis that those individuals living in Madrid are more adverse to redistribution.

In Model 5, we then proceed as in Model 1 in AA (table 2, p. 964) to remove VAR1 from the analysis. Following Wooldridge (2008), we can create iteration effects (along the same lines as when we want to find out if the returns from education have changed over time) and we proceed to incorporate regional beliefs at a disaggregated level for Madrid, Navarra and País Vasco, since these show a statistical significant relationship in our Model 3.

Model 6 corresponds to Model 2 in AA (table 2, p. 964) and shows how in 1995 the relationship of beliefs that luck determines income and the dependent variable (being left on the political spectrum) only holds in one region (Madrid), but not at an aggregate level (i.e. VAR1). In Model 6, again VAR1 is not statistically significant, but VAR1MA is highly significant and with the expected positive sign.

After removing those variables that are not statistically significant in Model 6, in Model 7, we find a positive relationship between city population and being a left-wing individual. Years of education (VAR5) is also found to have a negative relationship with being left-wing. Also, the larger the number of children (VAR8), the more adverse individuals are to redistribution and higher taxes. This also occurs in the USA economy in for example Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931), where more educated people with more children tend to be more adverse to redistribution and higher taxes. However, contrary to AA, we do not find a statistically significant relationship between VAR1 and DEP at an aggregate level, but we find it when we use regional beliefs in Madrid: that is, we find a strong positive relationship of 0.478 when using regional beliefs

Finally, in Models 9 and 10 we remove VAR1 and VAR4 to check the robustness of our result that shows the strong positive relationship between regional beliefs in Madrid VAR1MA) and ideological self-placement.

In summary, note that AA (table 2, p. 964) find at an aggregate (country) level a strong and positive significant influence of VAR1 on DEP in the range of 0.541–0.607. In our case, in 1995 (Table 1), we do not find an influence in Spain of VAR1 at aggregate level on DEP (note that this result is robust in all Models 1–10 as it is shown in bold in Tables 1 and 2).

However, from the regional belief effects, we find in 1995 a strong positive and significant effect of the belief in Madrid of the regional belief in Madrid that luck determines income (i.e. VAR1MA) on the probability of being leftist (DEP) (again, this result is robust in all Models 1–10 as it is shown in Tables 1 and 2 in bold. A possible explanation of our results is that Spanish regions have very different beliefs, and at aggregate level, it is not possible to uncover relationships that can explain the preferences for redistribution policies. More specifically, this evidence may be linked to the singular political situation of this region in Spain. In the definition of political orientation of Madrid, nationalist concerns are not determinant (since it is the capital of Spain), but economic and redistributional factors are more important. In this way, this may explain why variables such as preferences on equality and governmental and individual responsibilities are not statistically significant.

We also find very strong evidence that years of education in Spain have a negative impact on the probability of being left-wing and therefore, higher educational achievements significantly reduce the probability of strong preferences for redistribution. Note that in all Models 1–10, years of education (VAR5) is always statistically significant and with a negative sign. However, variables such as race, marital status, age or gender are not relevant in Spain.

In order to show the robustness of our results when we change our dependent variable from DEP to preferences for government redistribution (VAR17) and preferences for income equality (VAR17*), we report the results in Table 3. First, we show the dependence between DEP and VAR17*, and we also show the robustness of our results when we replace DEP by VAR17* in our previous model. We use the same variables as in table 7 in Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931.) and therefore we create a variable that measures years of education through attendance to high school (VAR21) and to college or higher (VAR22).

Table 3. The effect of the belief that luck determines income on being left on the political spectrum (DEP), income distribution (VAR17*) and government distribution (VAR17) in Spain in 1995

Dependent variable						
Models	**VAR17**	**VAR17***	**VAR17**	**DEP**	**VAR17**	**VAR17***
VAR17*	--	--	0.193	--	--	--
	--	--	(5.13)***	--	--	--
VAR17	--	--	--	--	--	--
DEP	0.078	0.370	--	--	--	--
	(1.86)*	(10.11)***	--	--	--	--
Aggregate						
belief						
VAR1	--	--	--	0.003	–0.012	0.005
	--	--	--	(0.65)	(–2.84)***	(1.21)
Socio-						
demography						
VAR21	--	--	--	0.105	–0.036	–0.137
	--	--	--	(1.71)*	(–0.56)	(–2.04)
VAR22	--	--	--	–0.086	–0.113	–0.239
	--	--	--	(–1.68)*	(–2.10)**	(–4.28)**
Regional						
belief						
fixed effects						
VAR16MA	--	--	--	–0.276	–0.167	–0.075
	--	--	--	(–3.06)***	(–1.75)*	(–0.76)
VAR1MA	--	--	--	0.034	0.015	0.015
	--	--	--	(2.17)**	(0.89)	(0.94)
Constant	0.587	0.369	0.552	0.715	0.733	0.492
	(16.63)***	(10.11)***	(21.49)***	(24.89)***	(24.16)***	(15.69)***
R^2	0.005	0.016	0.040	0.029	0.026	0.038

Note: We report OLS estimates with *t*-statistics in parenthesis (*significant at 10%, **significant at 5% and ***significant at 1%). As in AA, Probit and Logit also give similar results than OLS.

We confirm a strong correlation that is statistically significant between DEP, VAR17* and VAR17 in 1995 VAR17 (i.e. common determinants in Spain in 1995 both for being leftist, preferences for income equality and government distribution). Regardless of the use of DEP, VAR17 and VAR17*, we confirm that (1) years of education, basically at university level (VAR22) is the most important factor to determine preferences of Spanish individuals for redistribution in 1995, (2) regional beliefs-fixed effects are relevant when using DEP although not with VAR17 and VAR17*, (3) regional–fixed effects are relevant for Madrid both when using DEP and VAR17, and they have the same sign: evidence of a strong right-wing group in Madrid in 1995.

The most important difference with AA is that VAR1, is found to have a positive influence in Spain both when using DEP and VAR17* that is not statistically significant. With VAR17, the estimate is negative.

Year 2007

The results for 2007 are given in Table 2. Note that now, income (VAR3) and the group age effects (from VAR11 to VAR15) are the relevant ones in Spain and they have the expected sign as in AA. In contrast, the years of education (VAR5) does not have such a strong influence as in 1995.

Model 3 confirms the existence of regional–fixed effects in Cataluña and some evidence in Galicia, Navarra and Castilla La Mancha. The regional–fixed effect in Cataluña indicates the relevance of a strong left-wing group in 2007 and this result is very robust in all the ten models that we consider. Not only the regional–fixed effect in Cataluña is estimated to be positive, but also it is highly statistically significant. We also detect in some models the existence of a left-wing group in Navarra and a right-wing group in Castilla La Mancha and in Galicia in this period, although they are not as strong as in Cataluña.

We now find moderate evidence that aggregate belief that luck determines income in Spain has a positive relationship with the probability of being leftist, although the result is not that strong as in AA. There is therefore some evidence of more homogeneous beliefs in Spain in this period that allows to identify an aggregate belief in Spain. Moreover, regional belief effects are not statistically significant anymore when compared to the situation in 1995.

Finally, in relation to the geography/income and sociodemographic aspects that may affect individuals in Spain to increase their demand for redistribution, we do not find that years of education is the relevant determinant as it happened in 1995. In 2007, we find that income (VAR3) and age of individuals (VAR11 to VAR15) are the main determinants to contribute to the probability of individuals to be leftist. The estimated signs of those variables are the same as those reported in AA. Indeed, this evidence conforms to standard economic reasoning. Richer people, who have least to gain from redistribution, are usually less keen on it than their poorer compatriots.

These changes in the influence of education could be explained if we assume that the level of studies can act in an ambivalent way (Alesina and Giuliano, 2011 Alesina, A.

and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931). In general, in those societies where this variable is a crucial factor in income differences, the level of education is linked to the possibilities of social improvement in a way that those individuals will present less preferences for redistribution (as in Spain in 1995). Later, once education levels have increased significantly in many segments of the population and it is more generalized, including the highest levels of education (as happens in Spain in 2007), this variable starts to be less significant and that explains our results. In fact, the number of years of education increased, on average, from 3.80 to 4.67 in the 1995 to 2007 period. In the Spanish case this evolution is closely linked with the effect of redistributive policies implemented in those years. As an evidence of this effect, we can mention the large increase in the percentage of Spanish population that have obtained a degree; from 17 % in 1995 to 29% in 2007. On the other hand, the increase of educational levels in the population also seems to be linked to attitudes that are in favour of redistribution.

In Table 4 , we show the dependence between DEP, VAR17 and VAR17*, and we also show the robustness of our results in the previous section when we replace DEP by VAR17*. We use the same variables as in table 7 in Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931) and therefore we create a variable that measures age (VAR19). The square of age is not statistically significant in any of the regressions in Table 4.

Table 4. The effect of the belief that luck determines income on being left on the political spectrum (DEP), income distribution (VAR17*) and government distribution (VAR17) in Spain in 2007

Dependent variable						
Models	**VAR17**	**VAR17***	**VAR17**	**DEP**	**VAR17**	**VAR17***
VAR17*	--	--	**0.370**	--	--	--
	--	--	**(13.00)*** **	--	--	--
VAR17	--	--	--	--	--	--
DEP	**0.058**	**0.068**	--	--	--	--
	(1.68)*	**(1.85)***	--	--	--	--
Aggregate						
belief						
VAR1	--	--	--	0.005	–0.058	–0.046
	--	--	--	(0.69)	(–7.52)***	(–5.34)***
Geography						
/income						
VAR3	--	--	--	**–0.044**	**–0.043**	**–0.044**
	--	--	--	**(–5.07)*** **	**(–4.68)*** **	**(–4.44)*** **
Socio-						
demography						
VAR19	--	**--**	**--**	**–0.004**	**–0.001**	**0.001**
	--	--	--	**(–5.53)*** **	**(–0.89)**	**(0.96)**
VAR19 squared	--	--	--	--	--	--
Regional						
belief						
fixed effects						
VAR16CAT	--	--	--	**0.212**	**–0.234**	**–0.279**
	--	--	--	**(2.44)** **	**(–2.58)** **	**(–2.86)*** **
VAR1CAT	--	--	--	**0.005**	**0.033**	**0.030**
				(0.30)	**(1.84)***	**(1.52)**
Constant	0.639	0.394	0.517	1.078	1.169	0.814
	(21.63)***	(12.51)***	(27.24)***	(15.67)***	(16.29)***	(10.53)***
R^2	0.003	0.004	0.156	0.07	0.09	0.07

Note: We report OLS estimates with *t*-statistics in parenthesis (*significant at 10%, **significant at 5% and ***significant at 1%). As in AA, Probit and Logit also give similar results than OLS.

We confirm again a strong correlation that is statistically significant between DEP, VAR17 and VAR17* and both in 1995 and in 2007.

Regardless of the use of DEP, VAR17 and VAR17* (i.e. common determinants in Spain in 2007 for being leftist, preferences for income equality and government distribution), we confirm that (1) income (VAR3) is the most important factor to determine preferences of Spanish individuals for redistribution in 2007, (2) regional beliefs-fixed effects are relevant both when using DEP and VAR17* and they are only moderately relevant when using preferences for government redistribution and (3) regional–fixed effects are relevant for Cataluña.

Now, the most important difference with AA is that estimated effect of VAR1 is positive when using DEP although not statistically significant. With VAR17* and VAR17, the estimate is negative and statistically significant.

The change observed in the sign of the relation between the belief that luck determines income (VAR1) and preferences for equality (VAR17*) should be interpreted with caution. The question about income inequality in the WVS does not directly capture awareness of how much inequality there is. Instead, it mixes both awareness of the degree of inequality and attitudes about the fairness of that perceived level of inequality. Then changes in responses to this question could be a consequence of changes in people's views about how much inequality there is (Kenworthy and McCall, 2008 Landier, A., Thesmar, D. and Thoenig, M. (2008) Investigating capitalism aversion, Economic Policy, 23, 465–97.

IV. Conclusions

This article analyses the main factors determining the demand for redistribution in Spain both at an aggregate and regional level. Particularly, we posed three research questions: (1) does the belief that society is unfair have a significant effect on the individuals' preferences for redistribution?, (2) are regional beliefs in all Spanish regions equally important when determining demand for redistribution? and (3) have the preferences for redistribution changed over time?

In order to answer those questions, we estimate ten models in which preferences for redistribution are initially proxied by the ideological self-positioning of individuals. The data source for our estimations is the results World Values Survey (1995 and 2007 waves).

The main finding of this study is the existence of a structural change in preferences formation for redistribution in Spain between 1995 and 2007. Some of those crucial changes can be summarized as follows.

First, in 1995, we provide evidence that one of the most important factors that determine individuals' political choices is the level of studies (years of education). Variables such as race, marital status, age or gender are not relevant in Spain in this period as explanatory variables. However, in 2007, the variable years of education is

no longer significant. In this year, income and age of individuals are the main determinants of the probability of individuals to be leftist.

Second, our results show in 1995 that only the luck-effort variable is significant only in some of the regions. In special, it is a determinant variable in Madrid. In 2007 this variable is slightly significant for all regions. This evidence suggests that the belief that the system is unfair, i.e. success is determined by luck, tends to increase the probability of strong preferences for redistribution in Spain at an aggregate level. In this sense, the situation in Spain is more similar in 2007 to the results given in AA although regional beliefs are still very relevant in Spain and therefore we argue that they must be introduced in the model of AA in Spain. However, beliefs about the importance of good or bad luck in determining high or low incomes is not the decisive source of differences in individual demand for redistribution.

Third, the regional–fixed effects allow us to support the hypothesis that some regions in Spain were more left or right-wing. That is, people in certain regions (i.e. Madrid in 1995/Cataluña in 2007) tend to favour less/more redistribution than other regions. This evidence suggests that particular circumstances in these regions (cultural, political, etc.) make people with similar income and education show different attitudes towards redistribution. In fact, we find evidence of some regions having strong leftist beliefs or being more right-wing. A possible explanation for these changes in preferences at a regional level may be related with the orientation of redistributive policies pursued (supply-side) by regional governments. Policies adopted by the regional governments could influence the individual attitudes towards redistribution and, therefore, these attitudes can change over time depending on the political orientation of the government in office during the years before the survey was conducted

Finally, we confirm a strong correlation that is statistically significant between being leftist, preferences for income equality and government distribution both in 1995 and in 2007. This result can be interpreted as suggesting the existence of common determinants in Spain for those variables.

As a future line of research, we could study how this temporary evolution of redistribution preferences in Spain may be linked to the rapid social changes that have taken place from 1995 to 2007, both in terms of an increase in income level and in the incorporation of a great influx of immigrants (since 1980, the percentage of immigrants in the total population in Spain has increased from around 1.5% to more than 12% in 2010). In fact, there are many studies that show that altruism has many cultural and racial barriers: when we have a group of people that not only have low income but also belong to a racial or cultural minority, the majority of people tend to decrease their preferences for redistribution. In general, most of the individuals tend to feel more generous with those they feel closer to culturally and racially (see Alesina *et al*., 2001 Alesina, A. and Glaeser, E. (2004) Fighting Poverty in the US and Europe, Oxford University Press, Oxford.; Alesina and Glaeser, 2004 Alesina, A. and Giuliano, P. (2011) Preferences for redistribution, in Handbook of Social Economics (Eds.) A. Bisin and J. Benhabib, North Holland, The Netherlands, pp. 93–132.; Akkoyunlu *et al*., 2009

Akkoyunlu, S., Neustadt, I. and Zweifel, P. (2009) Why does the amount of income redistribution differ between United States and Europe? The Janus Face of Switzerland. SOI Working Paper No. 0810, University of Zurich, Socioeconomic Institute, Zurich. ; Fong and Luttmer, 2009 Fortin, N. M. (2005) Gender role attitudes and the labour-market outcomes of women across OECD countries, Oxford Review of Economic Policy, 21, 416–38.; Fong *et al.,* 2006 Fong, C. M. and Luttmer, E.F.P. (2009) What determines giving to hurricane katrina victims? Experimental evidence on racial group loyalty, American Economic Journal: Applied Economics, 1, 64–87. Luttmer, 2001 Meltzer, A. H. and Richard, S. F. (1981) A rational theory of the size of government, The Journal of Political Economy, 89 914–27.

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Appendix

A.1 Variables

The variables that are used by AA are given as follows: The dependent variable (**DEP**) corresponds to 'Being left on the political spectrum'. It answers the question at the aggregate (all regions) level in Spain: 'In political matters, people talk of left and right. How would you place your views on this scale, generally speaking?'. It is a variable that ranges from 1 to 10, 1 being the most leftist. Following AA, we classified leftist as anyone in Spain who answered with a score of 5 or below. The dependent variable corresponds in the EVS for Spain to the references: **e033** in 1990, **V123** in 1995 and **V114** in 2007. The independent variables, following AA (Table 2) are: **VAR1:** 'Individual belief that luck determines income'. It corresponds to the answer to the question: 'In the long run, hard work usually brings a better life. Or, hard work does not generally bring success; it's more a matter of luck and connections'. It is a variable that ranges from 1 to 10. Following AA, answers are recoded on a scale 0 to 1, with 1 indicating the strongest belief in luck. This varia ble is not available in the EVS for 2000, and this prevent us from showing the Spanish analysis in 2000. The variable corresponds in the EVS for Spain to the references: **e040** in 1990, **V129** in 1995 **and V120** in 2007. **VAR2:** 'Gini Index'. We obtain the Gini Index for the 17 Spanish regions in 1995 from Izquierdo and Lacuesta (2007 Kenworthy, L. and McCall, L. (2008) Inequality, public opinion and redistribution, Socio-Economic Review, 6, 35–68.). For 1990 and 2000 in Spain, VAR2 is available in Cañón, *et al*. (2005 Cañón, L. A., Málagay, A. J. and Chaparro, F. P. (2005) Desigualdad y Bienestar en la Distribución Intraterritorial de la Renta, 1973–2000, Working Paper Series, P. T. N.o 6/05, Papeles de Trabajo del Instituto de Estudios Fiscales, Madrid.). We decide in 2007 to take the values coming from Iglesias-Fernández *et al*. (2009 Izquierdo, M. and Lacuesta, A. (2007) Wage inequality in Spain, recent developments, Working Paper Series No. 781, European Central Bank, Frankfurt am Main) where the Gini index is disaggregated by gender. We

weight those indexes with the average number of females/males of VAR9 in 2007 in Spain to construct a proxy of the aggregate Gini index. **VAR3: '**Income'. The variable corresponds in the EVS for Spain to **x047** in 1990, **V227** in 1995 and **V253** in 2007. **VAR4:** 'City Population'. The variable corresponds in the EVS for Spain to **x049** in 1990, **V232** in 1995 and **V255SC** in 2007. **VAR5:** "Years of education". The variable corresponds in the EVS for Spain to **V217** in 1995 and **V238** in 2007. This variable is not available in Spain in 1990. **VAR6:** 'White'. The variable corresponds in the EVS for Spain to **x051** in 1990, **V233** in 1995 and this variable is not available in the survey in 2007 for Spain. We argue that given the race structure in the Spain, since more than 98% of the Spanish population is white, this variable is not important in the Spanish case. **VAR7:** 'Married'. The variable corresponds in the EVS for Spain to **x007** in 1990, **V89** in 1995 and **V55** in 2007. **VAR8:** 'Number of Children'. The variable corresponds in the EVS for Spain to **x011** in 1990, **V90** in 1995 and **V56** in 2007. **VAR9:** 'Female'. The variable corresponds in the EVS for Spain to **x001** in 1990, **V214** in 1995 and **V235** in 2007. **VAR10:** in AA it corresponds to "US resident". In order to adapt it to the Spanish case, we have taken the answer to the question: 'At which geographical group would you say that you belong to?', with possible answers: (1) to the local entity/city where it lives, (2) to the regional area, (3) Spain in general, (4) Europe and (5) the world. We argue that this gives a measure of how attached individuals feel with their local/regional area. Answers are recoded on a scale 0 to 1. The variable corresponds in the EVS for Spain to **g015** in 1990, **V203** in 1995 and **V211** in 2007. **VAR11:** 'Age group 18–24'. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. **VAR12:** 'Age group 25–34'. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. **VAR13:** 'Age group 35–44'. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. **VAR14:** 'Age group 45–54'. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. **VAR15:** 'Age group 55–64'. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. We incorporate a new variable that is not included in AA. **VAR16:** 'Region where the survey was carried out' in Spain. This allows to introduce regional-fixed effects (for Spain). The variable corresponds in the EVS for Spain to **x048** in 1990, **V234** in 1995 and **V257** in

2007. We name: **VAR16***i* with AN, AR, AS, B, CAT, CANA, CANT, CASLE, CASLA, E, G, R, MA, MU, NA, PVAS, PVAL to denote the fixed effects corresponding to Andalucía, Aragón, Asturias, Baleares, Cataluña, Canarias, Cantabria, Castilla-León, Castilla-La Mancha, Extremadura, Galicia, Rioja, Madrid, Murcia, Navarra, País Vasco and País Valenciano. We choose País Valenciano as our reference group. These regional–fixed effects allow to support the hypothesis if some regions in Spain were more left–or right-wing and if we find statistical evidence of that.

We also need to incorporate the following variables to analyse the model of Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931, table 7) and García-Valiñas *et al*. (2008): **VAR17:** Preferences for redistribution. The variable corresponds in the EVS for Spain to **e037** in 1990, **V127** in 1995 and **V118** in 2007. Since in the EVS this variable takes values 1–10 (opposite to 1–5 in Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the

land of opportunities, Journal of Public Economics, 89, 897–931.), we rescale the variable, as in AA for DEP, from 0 to 1, and we set 1 when the individual answered 5 or below. **VAR17*:** Incomes more equal. Variable used in García-Valiñas *etal*. (2008) as a measure of preferences for redistribution. The variable corresponds in the EVS for Spain to **e035** in 1990, **V125** in 1995 and **V116** in 2007. **VAR18:** Fairness. The variable corresponds in the EVS for Spain to **a168** in 1990, **V27** in 1995 and **V47** in 2007. This variable also takes values 1–10 in the EVS in 2007. We set a value equal to 2 when the variable takes values 5 or below, and 1 otherwise, as in Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics, 89, 897–931.). **VAR19:** Age. The variable corresponds in the EVS for Spain to **x003** in 1990, **V216** in 1995 and **V237** in 2007. **VAR20:** Unemployment. The variable corresponds in the EVS for Spain to **x028** in 1990, **V220** in 1995 and **V241** in 2007. **VAR21:** High School. The variable corresponds in the EVS for Spain **V217** in 1995 and **V238** in 2007. This variable is not available in Spain in 1990. **VAR22:** College and more. The variable corresponds in the EVS for Spain to **V217** in 1995 and **V238** in 2007. This variable is not available in Spain in 1990.

A.2 Models

MODEL 1: It corresponds to Model 2 in AA (table 2, p. 964) for Spain without regional–fixed effects.

MODEL 2: It corresponds to Model 3 in AA (table 2, p. 964) for Spain without regional–fixed effects. We can see clearly how VAR2 is not statistically significant in Spain.

MODEL 3: It corresponds to Model 2 in AA (table 2, p. 964) for Spain with regional–fixed effects.

MODEL 4: It corresponds to Model 2 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, Navarra and Pais Vasco and where we remove those variables that are not statistically significant in Model 3.

MODEL 5: It corresponds to Model 1 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, Navarra and Pais Vasco and where we remove those variables that are not statistically significant in Model 3.

MODEL 6: It corresponds to Model 2 in AA (table 2, p. 964) for Spain with regional–fixed effects and with aggregate (i.e. VAR1) and regional beliefs (i.e. VAR1MA, VAR1NA and VAR1PVAS). We have created several variables that were not used in AA to introduce belief-fixed effects in the analysis: for example VAR1MA (theiteration effect of VAR1 with VAR16MA), VAR1NA (the iteration effect of VAR1 with VAR16NA) and VAR1PVAS (the iteration effect of VAR1 with VAR16PVAS) respectively.

MODEL 7: It corresponds to Model 2 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, Navarra and Pais Vasco, with aggregate (i.e. VAR1) andregional beliefs (i.e. VAR1MA, VAR1NA and VAR1PVAS), and where we remove those variables that are not statistically significant in Model 6.

MODEL 8: It corresponds to Model 2 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, with regional beliefs in Madrid (i.e. VAR1MA), and where we remove those variables that are not statistically significant in Model 6.

MODEL 9: It corresponds to Model 1 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, with regional beliefs in Madrid (i.e. VAR1MA), and where we remove those variables that are not statistically significant in Model 8. We also remove VAR4 because it was not statistically significant in Model 7 to check the robustness of our result for the relationship between VAR1MA and DEP.

MODEL 10: It corresponds to Model 1 in AA (table 2, p. 964) for Spain with regional–fixed effects for Madrid, with regional beliefs in Madrid (i.e. VAR1MA), and where we remove VAR8 from Model 9 since it was not statistically significant in Models 1, 3 and 6 to check the robustness of our result for the relationship between VAR1MA and DEP. Note also that VAR5 (years of education) is consistently found to have a negative impact on the probability of being right-wing in Spain in all Models 1–10.

Notes

1 For a literature review of the factors influencing preferences see Akkoyunlu *et al*. (2009 Akkoyunlu, S., Neustadt, I. and Zweifel, P. (2009) Why does the amount of income redistribution differ between United States and Europe? The Janus Face of Switzerland. SOI Working Paper No. 0810, University of Zurich, Socioeconomic Institute, Zurich.) and Alesina and Giulano (2011).

2 Benabou and Ok (2001), Alesina and Angeletos (2005 Alesina, A. and Angeletos, G.-M. (2005) Fairness and redistribution, The American Economic Review*,* 95, 960–80.) and Alesina and La Ferrara (2005 Alesina, A., Glaeser, E. and Sacerdote, B. (2001) Why doesn't the United States have a European-style welfare state?, Brooking Papers on Economic Activity*,* 2, 187–277.).

3 That implies that we may have some issues with the sample representativeness. Some methods to guarantee the representativeness involve the use of weights (see for example Ayala *et al*., 2006 Ayala, L., Navarro, C. and Sastre, M. (2006), La Attrition en el Panel de Hogares de la Unión Europea: ¿Cómo influye en la Movilidad de Ingresos?, XIII Encuentro de Economía Poíltica, Almería.); however, in our case it is not obvious how those weights may be implemented. We have checked that the descriptive statistics of all variables did not change substantially when we have removed from the sample those individuals where at least one of the variables show a 'no-answer'. Even so, we acknowledge that our results mainly for 1995 may be affected by sample selection issues.

4 Tables with the descriptive statistics of all variables (including those that we need to analyse the setting of García-Valiñas *et al*. (2008) and Alesina and Giuliano (2011 Alesina, A. and La Ferrara, E. (2005) Preferences for redistribution in the land of opportunities, Journal of Public Economics*,* 89, 897–931.)) can be obtained from any of the authors upon request.

5 A more detailed description of the variables can be seen in Appendix 1. A very similar specification can be found in Neher (2012 Panizza, U. (1999) On the determinants of fiscal centralization: theory and evidence, Journal of Public Economics, 74, 97–139.).

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