

# Socio-political Environment and Current Economic Situation

## Determinants of Ideology in Europe, 2002-2014

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### Econometric Models and Techniques in Economics

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Darío Serrano Puente  
Universidad Autónoma de Madrid

Helena Durán Mateos  
Universidad Autónoma de Madrid

Carlota Ramírez Torán  
Universidad Autónoma de Madrid

Alberto Vilar Caballero  
Universidad Autónoma de Madrid

#### **Abstract**

We are currently in a change situation in terms of political ideology in Europe with the emergence of new parties situated in both extremes of the ideological scale. Since this topic has come up into the main stage in almost every European country, we are going to analyze whether this change is real and which are the main socio-economic factors influencing the individuals' ideology. For that purpose, and according to our ordered dependent variable (position in the ideological scale), we have formulated and estimated an ordered probit model. The dataset used in this paper comes from the European Social Survey (ESS), conducted by the ERIC (European Research Infrastructure Consortium) in every European participating country. Our analysis covers the period 2002-2014. We have estimated different specification for Europe and Spain, considering models with and without interactions among some of the factors that are potentially relevant to drive the individual's political ideology. We have found that models with and without interactions give us very similar results. Trying to find similarities and differences between the estimations for Europe and Spain, we have obtained very similar effects about most of the considering factors. The most important difference comes from the indicator representing whether the individual voted in the last elections. For the case of Europe, if the individual voted in last elections the probability of the individual to consider herself on the right in the ideological scale increases, other things equal, 2.4 percentage points, while in the case of Spain it decreases 2.9 percentage points. This finding could be important in political science to study the socio-economic factors influencing individuals' ideology and to study its evolution over time. It could also be useful for political parties to help them about planning their electoral strategy depending on the profile they want to seduce according to a greater political affinity.

## Contents

1.	Introduction.....	3
2.	Literature review.....	4
3.	European institutional framework.....	6
3.1	Ideological evolution.....	6
3.1.1	Very significant changes in the ideology of governments .....	7
3.1.2	Significant changes in the ideology of governments .....	8
3.1.3	Small changes in the ideology of governments.....	9
3.2	Economic and social indicators.....	9
3.2.1	GDP per capita .....	10
3.2.2	Unemployment .....	11
3.2.3	Harmonized Index of Consumer Prices (HICP) .....	12
3.2.4	Gini index.....	13
3.2.5	Ranking of happiness 2013 - 2016.....	14
4.	Preliminary evidence.....	14
5.	An econometric model of the individual ideology .....	21
5.1	Ordered response models .....	21
5.2	The ordered probit model.....	23
5.2.1	Estimation.....	23
5.2.2	Marginal probability effects.....	24
5.3	Estimation results.....	24
6.	Conclusions .....	36
	References .....	38

## 1. Introduction

The development of globalization has introduced technological breakthroughs and profound changes in the economic, political and social fields. These changes bring new forms of government, and the need of new policies to conform to changes.

After the deep crisis of 2008 and the uncertainty that followed, Europe is now in a recovery situation. The economic policies have had a positive impact on recovery. In this environment of stabilization, it is easier to analyze how the European situation has changed since the beginning of the century until today. Strong economic policies adopted in the first moment, contracted the labor market and had a major impact on prices. So that today these economic policy measures that have boosted employment, by the low level of prices (especially oil) will favor the real income of households and private consumption.

With regard to social measures, external warlike conflicts as well as lack of political cohesion in European Union, are promoting migratory movements and the need of immediate measures able to manage this situation worldwide. Any society in history has always been growing, to the extent of their possibilities, while expanding their geographical areas to enlarge their markets influence (economic, social, etc.).

As in the past, the emergence of new technologies has opened a way of expanding markets, reaching a more integrated concept of society, what we now call ‘globalization’. The transit is being as controversial and revolutionary as in the past, especially since the time that this concept of globalization has come into conflict with the existing structures in each country, which are integrated into laws, social, religious commitments and practices of any nature. All of them are oriented to maintain the existing structure in each country and economic protectionism and/or social development of countries, and together, the European Union. The adaptation of these new legal and social rules is being promoted by true thrusters of globalization (population), represented by the political leaders, who should direct and approve such legislative and social changes, advocates of the structure to be modified. This situation calls for social and economic changes to different governments. This is a major problem.

On the one hand, politicians feel the logic inertia to protect their states maintaining, as far as possible, existing legislation in each country, so they are not ready for profound changes in legislation. In this context, the lack of response from politicians in each country to the problems arising from globalization is creating a lack of confidence of citizens in their respective political representatives, getting measures or solutions proposed by the rulers away from social demands. This situation is causing rulers are resorting to measures that attract new political trends. Hence, for the rulers, finding the balance between the population demands, if they really reflect the changes of globalization (social, economic and political), and its ability to modify the laws of each country and lead social changes, is fast becoming a very difficult task to manage with.

All these economic, social and political changes focused on global integration bring very complex evolutionary processes. The speed with which information, the movement of goods and capital markets (financial and human), and the cultural interaction that goes beyond the border limits, highlight the need to explore new global challenges, solving the new social framework, guiding our knowledge to conflicts resolution.

What is the relationship between employment and political trend? How does the political trend vary by age or gender? To what extent social changes affect northern and southern Europe? How does religion affect in politics?

These are some of the questions to be studied in this research project, with the aim of analyzing the political tendency of individuals, from a European perspective and particularly Spanish (as a response to the changes that are occurring in Europe). This will be done through the use and treatment of certain

variables directly related to the individual and her socio-political environment as gender, age, religion, education or satisfaction with democracy.

Distinction between different periods covered by the study (2002/2014) will be made, and between different parts of Europe, to make a comparison between them globally, and with the particular findings in Spain.

The rest of the paper is organized as follow. In Section 2, the paper provides a review of literature, in which some articles related to this study are included. Section 3 gives us information about the institutional framework, both in Spain and Europe. Section 4 is a description of the data used in the analysis. The econometric methodology and the estimation results of different models are described in Section 5. Finally, Section 6 offers some conclusions.

## 2. Literature review

Motivated by the first studies on political behavior of the century, a predominantly demographic orientation is observed in the literature.

Research on political orientation try to determine which factors are most influential in political participation and choice, as well as socio-demographic factors, economic status, age, gender, marital status, etc.

Political interest could be explained by reference to the economic capacity and social resources of citizens. The studies presented in this project explain that variable from a critical perspective that quantitatively evaluates the interest of individuals in politics. As van Deth and Elff (2004) described through a multilevel model, that analyzes political participation, the level of political interest of citizens depends on the level of economic development. This means that there is a positive relationship between individuals' economic status and their political participation.

Based on Lipset (1959) studies, the theory about the importance of political interest to the prosperity of democracy is reaffirmed, and it highlights the positive impact on economic development when democracy is firmly established.

In our work, we try to study the evolution of the political trend relating it to other variables, including satisfaction with the way democracy works, or individual incomes. About studies related to satisfaction with democracy, we can highlight that there is a relation between democratic satisfaction and the position of the ideologies of political parties, and this means that any extremist ideology causes a decrease in satisfaction with democracy (Curini, Jou, and Memoli, 2011). This analysis leads us to think that most voters will be in the middle, and the ideological extremes will be occupied by a small number of individuals, which will keep satisfaction with democracy on the average.

Without straying from our interest in the individual's degree of satisfaction with democracy, we continue with the analysis of life satisfaction. The main reason for this analysis is the existence of many political issues that need to obtain information on this topic, with the aim of defining the best policy. There are differences that can change the perspective of analysis:

- Geographic differences, and between nations, associated with different objective conditions
- Genetic and psychological differences
- Differences associated with the succession of significant events

Such differences can make that a satisfaction scale in a northern country does not have the same premises as a country of the south (Diener, Inglehart and Tay, 2012). However, in this project we do not consider these differences in the survey, because there are no differences between countries.

The most important variables in socio-demographic analysis are age, region and gender (Gonzalez and Darias, 1998). This leads us to point out that, the older individuals are, the more conservative their political leanings are.

Regarding the variables related to religious beliefs, results of Linz and Montero (1986) conclude that conservatives are more believers than progressives are. Instead, their study does not follow the same line as the above analysis, regarding claims that women were more conservative than men (Eysenck, 1964). Although in this field, they can act several economic and political factors. This idea could also be applied at European level (Julio Iglesias de Ussel 1990; Escribano and Balibrea 1999).

Religion is a cultural aspect that has been present throughout history. The impact on the thoughts and beliefs of individuals is a historical fact that directly affect their political and social decisions. Some articles, in which religious beliefs and political trends are related, show that historically individuals who consider themselves believers are, politically speaking, more conservative (Gonzalez and Darias, 1998).

Although Eastern cultures are characterized by being far more egalitarian and liberal, the studies show that in the modern era these differences are even more striking. With the progress of the equality of women, families have evolved, from traditional to modern thought on the role of the sexes. Regarding this analysis, some studies show that voters "right" have a more traditional view of gender roles (Morales Dominguez, 2013). These social changes are closely linked to high economic level and the development of knowledge and information (Norris and Inglehart, 2011).

We also analyze the migration side, because it can play an important role in policy measures. Hence, it is important to know how individuals relate migration and politics, and within this interaction it is important to analyze whether individuals follow a pattern or a political trend based on their vision on migration. Migratory movements require the attention of policy measures since the eighties for two reasons: the need to effectively control the borders and the political and social impact of these movements. In the states, concepts such as multiculturalism, which require immediate social and political measures, can solve issues such as social integration and cultural coexistence (Hall, 2005). Moreover, education and democracy are two variables that are closely related with multiculturalism.

The models that analyze the strength of educational institutions ensure that they are able to awaken the ability to interact with individuals and encourage organizations (Glaeser, Ponzetto, and Shleifer, 2007); this is the basis of society and politics. Almond and Verba (1989) supported this connection.

The most revolutionary political tendencies grow among university students, who are more open to change. It would be necessary to check if this theory is true today, crossing data between age, level of education and political trend. The states with the highest level of education meet the most stable parameters of democracy, on the same line; the high level of education promotes political participation democracy (Glaeser, Ponzetto, and Shleifer, 2007).

Following the same explanatory lines, studies analyze the relationship between professional development and political tendency of individuals. Implying that individuals who work in the public sector are further away from capitalist ideologies. All these theories follow the same pattern of economic interests, discussed in our work, through the crossing of variables such as the employment of individuals or years of unemployment. This will allow us to check whether there is a relationship between employment and political tendency, and what are the variables that have more weight in political decision-making.

This project will analyze the political ideology scale in Europe and Spain, as well as the factors that can be potentially associated with it according to the findings in the literature.

### 3. European institutional framework

Looking ahead to the European institutional framework we will focus, first, on the European ideological evolution and, second, on the economic performance of the European countries, based on a series of indicators that we have selected, such as GDP (Gross Domestic Product) per capita, unemployment, HICP (Harmonized Index of Consumer Prices), Gini index and Happiness Ranking.<sup>1</sup>

The data we use in this paper come from the European Social Survey (ESS), conducted by the ERIC (European Research Infrastructure Consortium). The ESS is an academically driven cross-national survey that has been conducted across Europe since 2001. This survey is conducted every two years by face-to-face interviews in newly selected, cross-sectional samples.

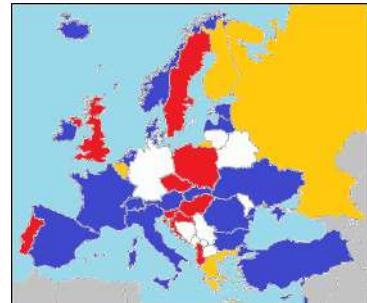
#### 3.1 Ideological evolution

Our data are related to different countries at different periods of time, i.e. we have a pool of cross sections data set, which allows us to see the ideological evolution during the years of reference. First, we report three different maps where we can see the political parties that have governed in each country during the years 2002, 2008 and 2014.

To do this we have considered which parties were governing and we have checked, from the ESS data, the ideology of the people that had voted these parties to see which the predominant ideology in each country was, in the scale from 0 (left) to 10 (right). If the average of the ideology reported by the voters of the corresponding party is between 0 and 4.5, we will consider the party concerned from the left side (red color in the map). If the average is between 4.51 and 5.5 we will consider the party concerned as a center one (yellow color). Finally, if the average ideology is between 5.51 and 10 we will consider the party is in the right side (blue color). In case of governments that had been formed in coalition, we have chosen the party that was leading the coalition or held most of representation by votes.

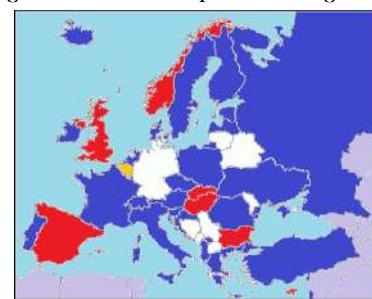
To comment the maps, we differentiated three different types of changes over the years 2002, 2008 and 2014. First, we have considered the very significant changes as those with a variation of more than  $\pm 2$  points in the ideology reported by the voters in the different waves. Second, we consider that significant changes are those between  $\pm 0.5$  and  $\pm 2$  points. Finally, we consider small changes those below  $\pm 0.5$  points.

Figure 3.1.1 Political parties during



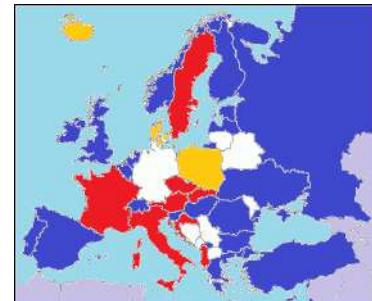
Source: Own calculations from ESS Data 2002

Figure 3.1.2 Political parties during 2008



Source: Own calculations from ESS Data 2008

Figure 3.1.3 Political parties during 2014



Source: Own calculations from ESS Data 2014

<sup>1</sup> We have not found data on Lithuania and Germany in the ESS so it is not possible for us to analyze the ideology of their voters.

### 3.1.1 Very significant changes in the ideology of governments

The table below shows the group of countries starting with left governments in the ideological scale in 2002 that had right government in the ideological scale in 2008 and left government again in 2014. This group is composed of Albania, Croatia, Czech Republic, Poland and Sweden. Taking a deeper look at the table, we discover certain similarity between two very different states, Albania and Sweden. Albania is a relatively new state organized in a republic while Sweden is an old state with a parliamentary monarchy. However, the voters of both countries consider themselves as left in the ideological scale. Nevertheless, in the year 2008 (with the economic crisis) the voters turned to a more conservative ideology while still voting the same party as before.

**Table 3.1.1.1 Countries with very significant changes with more frequent left ideology (ESS)**

Country	2002	2008	2014
<b>Albania</b>	1,84	7,8	1,84
<b>Croatia</b>	3,08	7,11	3,08
<b>Czech Republic</b>	4,28	7,74	4,28
<b>Poland</b>	3,63	6,93	5,39
<b>Sweden</b>	3,81	7,24	3,81

There are also countries that have behaved in the opposite way: they have had right governments during 2002 and 2014 with a left government amid both periods. These countries, reported in Table 3.1.1.2 are Bulgaria, Cyprus, Norway and Spain. We should talk about Spain where in 2000 PP (right party) formed government without coalition being able to approve laws and measures that were not welcomed by the people leading to a shift in the voters' ideology. Thus, the following elections evidenced the shift to the left in the ideological scale with the PSOE (left party) winning the elections. A new change occurred in 2011 may be due to the mistrust of the population in the political class, thus once again the voters shift to more right ideology.

**Table 3.1.1.2 Countries with very significant changes with more frequent right ideology (ESS)**

Country	200 2	200 8	201 4
<b>Bulgaria</b>	5,69	2,28	6,43
<b>Cyprus</b>	8,22	1,6	8,22
<b>Norway</b>	7,1	4,17	7,1
<b>Spain</b>	6,32	3,45	6,32

Apart from these countries in which the ideology in 2008 was different to that in 2002 and 2014, there are also countries with significant changes that have a clear evolution towards right ideology (Table 3.1.1.3) and others that have a clear evolution towards left in the ideological scale (Table 3.1.1.4). The first group is composed by Finland, Greece, Hungary, Portugal, Slovenia and United Kingdom. The majority of the voters of the government of these countries during 2002 were considered as left ideology and they have an evolution over the years to the right ideology. There are some special cases like Slovenia that has had the same party but their voters consider themselves more right in the ideological scale over time.

**Table 3.1.1.3 Countries with very significant changes with right ideology trend (ESS)**

Country	200	200	201
	2	8	4
<b>Finland</b>	4,51	6,62	7,55
<b>Greece</b>	4,72	8,01	8,01
<b>Hungary</b>	3,48	3,48	7,59
<b>Portugal</b>	3,85	6,82	6,82
<b>Slovenia</b>	3,75	6,06	6,06
<b>United Kingdom</b>	4,37	4,37	6,35

Finally, we can observe those countries that have an evolution towards a left ideology. These countries are France and Italy. The right governments of France and Italy did not have positive outcomes provoking the reject of the population so this is reflected in a trend towards the left ideology.

**Table 3.1.1.4 Countries with very significant changes with left ideology trend (ESS)**

Country	2002	2008	2014
<b>France</b>	7,04	7,04	3,38
<b>Italy</b>	6,73	7,25	2,99

### 3.1.2 Significant changes in the ideology of governments

As we said before, we consider significant changes in the political ideology those between  $\pm 0.5$  and  $\pm 2$  with respect to the previous wave considered. First, we can mention Austria and Slovakia, countries with an increasingly left tendency (Table 3.1.2.1). They have moved from left to right governments over the time.

**Table 3.1.2.1 Countries with significant changes with left ideology trend (ESS)**

Country	200	200	201
	2	8	4
<b>Austria</b>	5,55	5,55	4,19
<b>Slovakia</b>	5,95	4,42	4,42

Other significant changes correspond to those right governments whose voters are considering themselves with ideologies increasingly centrals (Table 3.1.2.2). These countries are Denmark, Iceland, Israel, and Ukraine. As an example to understand this group of countries we can talk about Denmark, a country traditionally governed by a coalition of parties characterized by pacts and political agreements. This is reflected in the central ideology of their voters.

**Table 3.1.2.2 Countries with significant changes with central ideology trend (ESS)**

Country	2002	2008	2014
<b>Denmark</b>	6,67	6,67	4,72
<b>Iceland</b>	6,98	6,98	5,18
<b>Israel</b>	7,67	5,64	5,64
<b>Ukraine</b>	6,99	5,79	5,79

### 3.1.3 Small changes in the ideology of governments

The countries in the Table 3.1.3.1 are characterized by the predominance of different right governments: Belgium, Ireland, Latvia, Luxembourg, Netherlands and Russia.

**Table 3.1.3.1 Countries with small changes with different governments (ESS)**

Country	200	200	201
	2	8	4
Belgium	4,51	6,62	7,55
Ireland	4,72	8,01	8,01
Latvia	3,48	3,48	7,59
Luxembourg	3,85	6,82	6,82
Netherlands	3,75	6,06	6,06
Russian Federation	4,37	4,37	6,35

Finally, we have the countries having the same government during all the years (Table 3.1.3.2) and the voters considering themselves as a stable right ideology. These countries are Estonia, Kosovo, Romania, Switzerland and Turkey. We should mention that the lack of data in the case of Kosovo is because the state reached its independence in 2002.

**Table 3.1.3.2 Countries with no changes in right-ideology (ESS)**

Country	200	200	201
	2	8	4
Estonia	6,1	6,1	6,1
Kosovo	--	7,12	7,12
Romania	6,95	6,95	6,95
Switzerland	6,85	6,85	6,85
Turkey	7,74	7,74	7,74

## 3.2 Economic and social indicators

We have selected five different indicators that allow us to see the economic and social performance of the countries in the years considered. We analyzed the following measures: the GDP, the Gini index as a measure of inequality in the income distribution, the unemployment rate, the HICP and a Happiness Index obtained from the World Happiness Report. We have chosen the information from 2000 to 2014 because the main source that we are using is the ESS and this survey records data from 2002 so with our period we cover the years in which the survey has been carried out.

We are going to study these indicators in two different ways. First, we compare their evolution in Spain and Europe, where the indicators for Europe are an average of the different countries weighted by the population. Second, we analyze the indicators in terms of the European geographical areas, Nordic, East, Centre and South, where the countries included in each category are as follows (Table 3.2).

**Table 3.2 Constituents in each country aggrupation**

Group	Constituents
Nordic	Denmark, Finland, Island, Norway and Sweden
South	Cyprus, Greece, Israel, Italy, Portugal, Spain and Turkey
East	Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine
Center	Austria, Belgium, France, Germany, Ireland, Luxemburg, Netherlands, Switzerland and United Kingdom

### 3.2.1 GDP per capita

As we previously said, we start with the comparison between Spain and Europe, which is shown in Figure 3.2.1.1.

We can see that in the years preceding the crisis the Spanish growth compared to previous years was higher than the European average. The economic crisis caused a decline in GDP per capita across the continent. Nevertheless, as we can see in the graph, Spain had a slower and complicated recovery compared with the European average. Since 2009, the European average line is taking a better and faster recuperation.

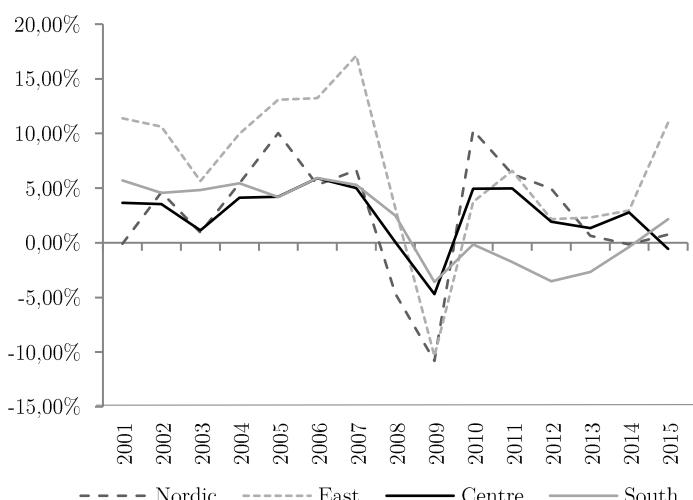
Figure 3.2.1.1 Europe-Spain GDP per capita growth (%)



Source: Eurostat

In the analysis by areas, shown in Figure 3.2.1.2, we can see that geographically all European areas have similar behaviors. We can also note that in the years before the crisis Eastern Europe has more growth than the rest, while the countries of central Europe were growing in a more moderate way. We can say that this moderate growth was less affected by the economic crisis so, as we said before, Eastern Europe was growing faster but with an uncontrolled growth. Finally, we note that after the economic crisis the countries of central Europe were those who had greater difficulty to face recovery, knowing that they had not been the most affected.

Figure 3.2.1.2 GDP per capita growth (%) by region



Source: Eurostat

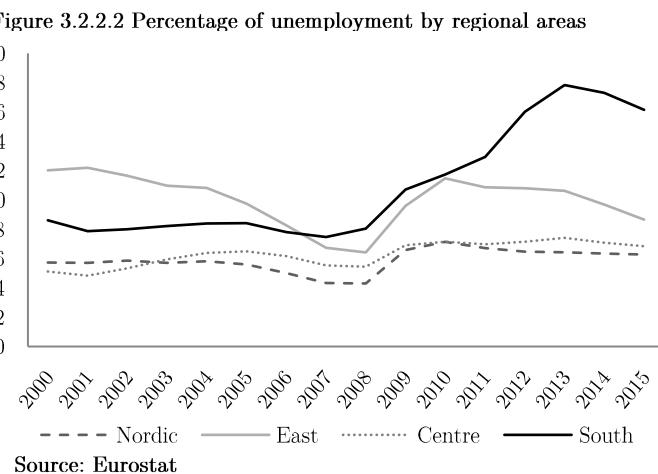
### 3.2.2 Unemployment

We have analyzed the unemployment rate over the total active population first comparing Spain and Europe and then comparing the different European geographical areas.

Figure 3.2.2.1 shows the unemployment rate comparing Spain and Europe. The unemployment rate in Spain is an issue that has been very controversial. The economic crisis made finding a job considerably challenging, in contrast with other European countries like Germany, which had empowered the minijobs to minimize the percentage of unemployment. Taking control of the Spanish unemployment has been a complicated task. The unemployment rate in Spain has reached levels that had never been seen, catching up almost a 30% of the active population. The migratory movements have had an impact in the unemployment rate of certain European countries because part of their population felt overqualified to accept certain jobs which are finally occupied by immigrants.



Now we are going to analyze the performance of the unemployment in different geographical areas. The crisis has caused a large increase in unemployment rates that has affected to all geographical areas. However, we can see that the most affected ones have been the countries of Southern Europe, where they have reached unprecedented rates very difficult to be controlled. Anyway, we can see the downward trend of the last years that shows a mild recuperation.



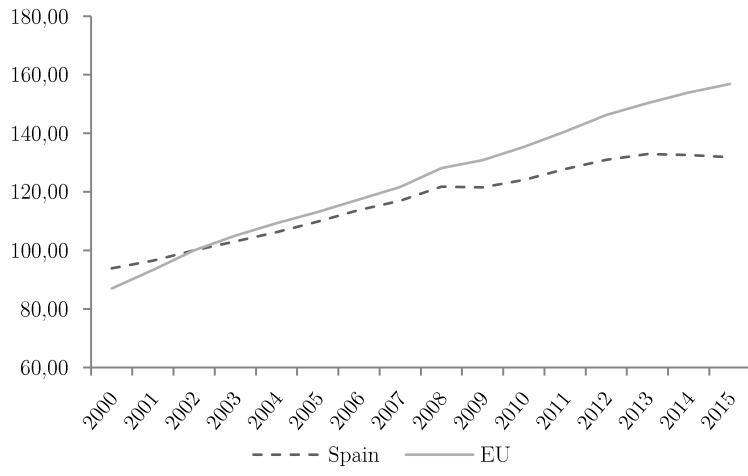
We cannot forget that we are talking about unemployment rate, which is also dependent on the total active population. It means that migratory movements significantly affect the unemployment.

### 3.2.3 Harmonized Index of Consumer Prices (HICP)

The European Central Bank describes the HICP as an aim to be a representative measure of the developments in the prices of all goods and services available for purchase within the euro area for the purposes of directly satisfying consumer needs. It measures the average change over time in the prices paid by households for a specific, regularly updated basket of consumer goods and services. We should note that although the HICP refers to the Eurozone, we are going to analyze all the countries of the ESS. We have used 2002 as the year of reference, i.e., the index is 100 in 2002.

The HICP follows an increasing trend, which is interpreted as a continuous rise in the prices of basic goods and services. Spain takes a similar behavior until the economic crisis where the growing trend disappeared and the evolution of the prices exhibited a downward trend.

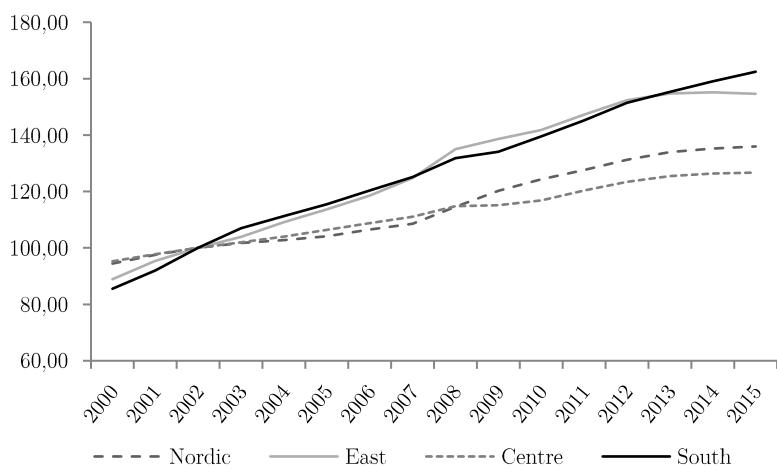
**Figure 3.2.3.1 HICP (Ref. 2002) Europe-Spain**



Source: Eurostat

Nordic, Eastern and Central countries have the same behavior as Spain, where in the recent years the growing trend has disappeared and the prices have stopped rising. However, the countries of Southern Europe not seem to suffer this stagnation in the steady rise in prices, and the prices are still increasing. The stagnation of prices in Spain is a special case compared to the performance in the rest of the countries in Southern Europe, therefore the sum of all of them is growing.

**Figure 3.2.3.2 HICP (Ref. 2002) Geographical areas**



Source: Eurostat

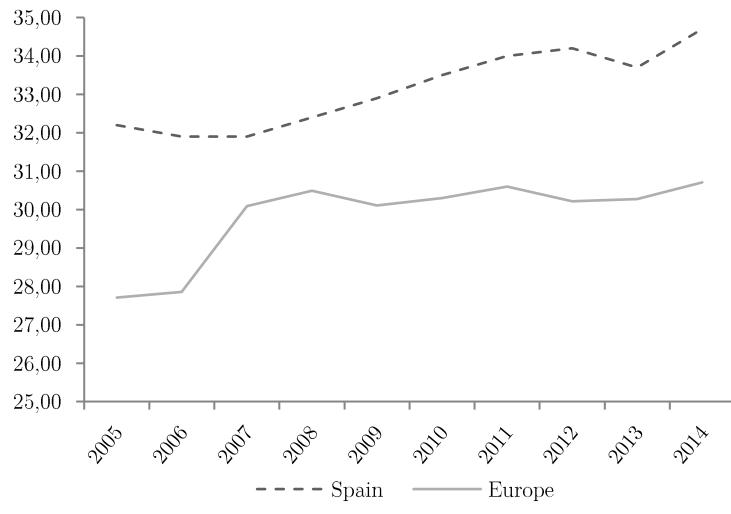
### 3.2.4 Gini index

According to the World Bank the Gini coefficient is a measurement of the income distribution of a country's residents. The Gini coefficient measures the inequality and takes values between 0 and 1. The value 0 represents perfect equality in the income distribution and the value 1 represents maximal inequality.

We report the evolution of the Gini index in a scale from 0 to 100 for the years 2005 to 2014 in Spain and Europe. We will only study this period as there is not enough information for the previous years.

We can see how the level of inequality in Spain is above the European average. It is a fact that although it seems stable, it has a slight increasing trend, which means that inequality is increasing. We also see that the slope in Spain is higher than the Europe, so the inequality in Spain is increasing faster.

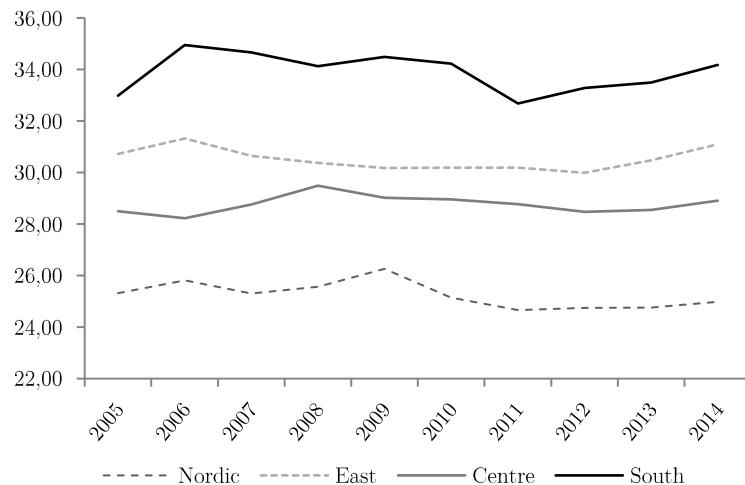
**Figure 3.2.4.1 Gini index Europe-Spain**



Source: Eurostat

We can see how in every geographical area the Gini index over time remains between 25 and 35 points over 100, which means high level of inequality. The most unequal countries are those of the Southern Europe, while the Nordic countries are the ones with the smallest inequality.

**Figure 3.2.4.2 Gini index by geographical areas**



Source: Eurostat

### 3.2.5 Ranking of happiness 2013 - 2016

Based on the World Happiness Report 2016, we have emphasized our attention on the ranking of happiness according to indicators like GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity and perceptions of corruption.

As there is not a report on happiness exclusively for European countries we have created our own ranking using the world ranking of the latest World Happiness Report that covers most of the years that we are studying. We do not have information to make the evolution report.

The World Happiness Report takes into account different aspects of the public life that makes the Nordic countries record positive results collaborating to make them the happiest area in Europe.

The United Nations stresses the importance of welfare for economic and social development, it is demonstrated that citizens are more productive and civic if they have more welfare. Paradoxically the fact of knowing that they belong to the happiest countries makes that happiness increase.

Figure 3.2.5 Top 20 European Happiness Ranking

Position	Country	Position	Country
1	Denmark	10	Belgium
2	Switzerland	12	Ireland
3	Iceland	13	Luxembourg
4	Norway	14	United Kingdom
5	Finland	15	Czech Republic
6	Netherlands	16	France
7	Sweden	17	Spain
8	Israel	18	Slovakia
9	Austria	19	Italy
10	Germany	20	Russia

Source: World Happiness Report 2016

## 4. Preliminary evidence

Unfortunately, not every country is included in every round of the survey we have used for extracting our data. This fact makes the questionnaire not homogeneous and hence the variables are not comparable across years and across countries. Our sample period is 2002–2014. With the aim of obtaining consistent results, we had to select available variables in every round of the survey and variables conducted in every country within the scope of our project.

In the dataset, there is not an identification variable that allows us to follow the individual's dynamic behavior. It means that the dataset is not a panel, but a pool of cross sections. This implies that we cannot control for individual fixed effects in this analysis, but we can control for aggregate time effects.

The aim of the current project is to find a relationship between the socio-economic factors which individual lives with and to analyze how these factors could influence the individual ideology, which is an important element in the voting-decision process of the individual. We consider that the 'placement on left right scale' variable from the ESS dataset acts as a good approximation of the individual ideology. We use the same argument used by John Levi Martin (University of Chicago, 2015), who argued, 'Political ideology can best be understood as actors' theorization of their own position, and available strategies, in a political field'.

**Table 4.1 Frequency table of the original target variable**

Placement on left right scale	Freq.	Percent	Cum.
Left	9,479	3.42	3.42
1	6,785	2.45	5.87
2	15,239	5.50	11.36
3	27,219	9.82	21.18
4	27,835	10.04	31.22
5	92,584	33.39	64.61
6	26,438	9.54	74.15
7	29,340	10.58	84.73
8	23,071	8.32	93.05
9	7,969	2.87	95.93
Right	11,289	4.07	100.00
Total	277,248	100.00	

The objective variable is defined in the survey in a range from 0 to 10, where 0 is the extreme left and 10 is the extreme right. The interviewed individual has also the possibility of refusing the question, not knowing the answer or directly not answering it. Regarding to this range in the variable, we obtain the frequency table showed in the Table 4.1.

As we can see, most of the individuals are located in the center of the range. Knowing the peculiar features of this space in the left-right scale, we create a new variable that groups all individuals into three clearly defined groups.

In the new created variable, all individuals with an ideology of 3 or less than 3 are classified into the value 0 (left). Individuals with an ideology of 7 or more than 7 are included into the value 2 (right). The rest are obviously included into the value 1, which refers to the center of the left-right scale. After doing this grouping strategy, the frequency table leads us to Table 4.2.

How European population is distributed along this new scale? We can see that a little bit more than a half (52.97%) of the individuals consider themselves as being in a center position. The individuals on the right add up to a quarter of the total (25.85%) and the ones on the left reach slightly lower levels than those on the right.

**Table 4.2 Frequency table of the created target variable**

Placement on groups scale	Freq.	Percent	Cum.
Left	58,722	21.18	21.18
Center	146,857	52.97	74.15
Right	71,669	25.85	100.00
Total	277,248	100.00	

Regarding the evolution of this variable along time (Table 4.3), we can see that the proportions are similar across years, although we can observe that the right part of the scale augmented during the crisis. However, just focusing on the preliminary evidence, we cannot infer a clear change in the population behavior in terms of ideology. The pattern is almost the same across years.

**Table 4.3 Frequency table of the modified target variable over time**

Placement on groups scale	2002	2004	2006	2008	2010	2012	2014
Left	22.06	20.72	21.79	21.20	20.64	20.51	21.88
Center	53.31	53.86	54.08	51.72	53.34	51.65	53.60
Right	24.63	25.43	24.13	27.08	26.02	27.84	24.53
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

For simplicity on the analysis and following the repeated topic of the different groups of countries in Europe, we have done four groups of countries with regard to their geographic location (Table 3.2).

This country classification leads us to important differences in the political ideology in the left-right groups' scale according to the four country groups.

As we can observe in the Table 4.4, the Nordic countries are clearly heeled to the right (33.39%), having a weak part on the left of the scale (19.21%). The South countries have the strongest left part of the scale across countries (23.55%), which seems coherent since they are the neediest countries in Europe economically speaking. At the same time, we can observe how these South countries are the group with one of the weakest center part of the scale (48.14%) after the Nordic countries, which can be motivated by the crisis period since in this period we show a radicalization process in the society. At the same time, the East countries have a stronger center part of the scale (52.44%), although the right part (27.27%) is clearly greater than the left part (20.29%). Finally, yet importantly, we can see how the Center countries have the weakest right part of the scale (20.05%), even lower than the left one (21.82%), which is clearly lower than the right one in the rest of the country groups. It results in a large center part of the scale (58.13%), which could be derived from the proximity of the political parties in this region of Europe.

Table 4.4 Frequency table of the modified target variable by country group

Placement on groups scale		Nordic	South	East	Center	Overall
Left	Freq.	9,380	10,337	16,685	22,320	58,722
	Percent	19.21	23.55	20.29	21.82	21.18
Center	Freq.	23,147	21,128	43,127	59,455	146,857
	Percent	47.40	48.14	52.44	58.13	52.97
Right	Freq.	24.63	25.43	24.13	27.08	26.02
	Percent	33.39	28.31	27.27	20.05	25.85
Total	Freq.	48,834	43,890	82,242	102,282	277,248
	Percent	100.00	100.00	100.00	100.00	100.00

We now focus on other socioeconomic factors that could be potentially related to the individual political ideology, according to the literature.

The first example is the variable religion. The original variable in the dataset 'type of religion' is a scaled variable with values 0 to 8. In this original variable, the individuals that answered that they were religious are classified into the type of religion of belonging. The value 1 corresponds to Roman Catholic, 2 to Protestant, 3 to Eastern Orthodox, 4 to Other Christian denomination, 5 to Jewish, 6 to Islamic, 7 to Eastern religions and 8 to Other non-Christian religions.

For the sake of interpretation, it has been recoded into a new variable that groups the values 0 to 4 in the Christian group, matches the value 5 with the Jewish group, the value 6 with the Islamic group and the values 7 and 8 to the other religion group. In this case, the value 0 is associated with the individuals that answered that they were non-religious. The distribution of this recoded variable is shown in Table 4.5.

What we can clearly see is the fact that almost a 40% of the people is non-religious. The Christian people represent a percentage of 54.8% of the population, it means that it is the biggest group so far jointly with the non-religious people. The Islamic religion occupies a 3.86% of the population and the Jewish religion a 2.41%. There is a residual group of people belonging to a religion which is different from these religions mentioned.

**Table 4.5 Frequency table of the new religion variable**

Placement on left right scale	Freq.	Percent	Cum.
Non-religious	120,010	38.35	38.35
Christian	171,473	54.80	93.15
Jewish	7,552	2.41	95.57
Islamic	12,065	3.86	99.42
Other religion	1,811	0.58	100.00
<b>Total</b>	<b>312,911</b>	<b>100.00</b>	

The original variable ‘satisfaction with democracy’ turns from a 0 to 10 scale to values 0, 1 or 2. The original value was coded from 0 to 10 being 0 extremely dissatisfied and 10 extremely satisfied with the way democracy works in the country. Values less or equal than 3 in the original values correspond to value 0 in the new one, which means ‘not satisfied’. Values 4, 5 and 6 in the original variable match to value 1 in the new one, which means ‘satisfied’ and the rest of the values correspond to the value 2 in the new variable, which means ‘very satisfied’.

This transformation is also followed for the ‘perception of the immigration’ variable. The original value is coded from 0 to 10 being 0 ‘immigrants make the country worse place to live’ and 10 ‘immigrants make the country better place to live’. In this case, the value 0 in the new variable corresponds to ‘immigrants make the country worse place to live’ and groups the values 0 to 3 from the original variable. The value corresponds 1 to ‘immigrants do not impact’ and groups values 4 to 6 from the original value. Moreover, 2 corresponds to ‘better place to live’ and groups values 7 to 10 from the original variable.

In the case of the ‘household income source’ variable, we have made another transformation that groups all the types established in the survey into three categories. The original variable represents the main source of household income and takes the value 1 if the main source is wages or salaries, 2 for main source of income self-employment, 3 for main source of income farming, 4 for pensions, 5 for unemployment/redundancy benefit, 6 for any other social benefits or grants, 7 for income from investments (savings) and 8 for income from other sources. In the new variable, the value 0 corresponds to ‘wages, investments and savings’ and groups the values 1, 2, 3, 7 and 8 of the original variable. The value 1 corresponds to ‘pensions’ and takes the value 4 from the original variable. In addition, 2 corresponds to ‘government benefits’ and groups the values 5 to 7 from the original variable.

Apart from these modified variables, we have other variables used in this project directly extracted from the ESS survey without any transformation. These variables are whether the individual has voted in last national elections’ (binary yes/no variable that takes value 1 for ‘yes’ and 0 for ‘no’), the gender (1 for ‘male’ and 0 for ‘female’), whether the individual has ever been unemployed and seeking work for a period larger than 3 months (binary yes/no variable that takes value 1 for ‘yes’ and 0 for ‘no’), the feeling about the household’s income nowadays (where 0 corresponds to ‘very difficult on present income’, 1 to ‘difficult on present income’, 2 to ‘coping on present income’ and 3 to ‘living comfortably on present income’), the age and the years of education.

**Table 4.6 Descriptive statistics of the variables**

	2002	2004	2006	2008	2010	2012	2014	Overall
Religion <sup>2</sup>	<b>Mean</b>	.642	.626	.615	.659	.645	.621	.514
	<b>St. dev.</b>	.479	.483	.486	.473	.478	.484	.499
	<b>#obs</b>	42094	44798	42625	56421	52136	54231	28105
Age	<b>Mean</b>	46.054	46.133	47.235	47.051	47.913	47.870	48.777
	<b>St. dev.</b>	18.204	18.420	18.550	18.508	18.793	18.587	18.677
	<b>#obs</b>	42044	47234	42707	56539	52319	54537	28166
Male	<b>Mean</b>	.474	.459	.455	.454	.453	.456	.479
	<b>St. dev.</b>	.499	.498	.497	.497	.497	.498	.499
	<b>#obs</b>	42247	47426	42893	56716	52435	54653	28197
Years of education	<b>Mean</b>	11.849	11.517	12.153	11.937	12.295	12.536	13.105
	<b>St. dev.</b>	4.031	4.029	4.118	4.176	4.052	4.029	3.728
	<b>#obs</b>	41664	46923	42445	56232	51827	54231	28020
Voted last national election	<b>Mean</b>	.751	.711	.727	.722	.708	.704	.703
	<b>St. dev.</b>	.432	.453	.445	.447	.454	.456	.456
	<b>#obs</b>	41773	47036	42487	56207	51922	54242	28002
Ever unemployed and seeking work > 3m	<b>Mean</b>	.243	.242	.260	.257	.265	.297	.278
	<b>St. dev.</b>	.429	.428	.438	.437	.441	.457	.448
	<b>#obs</b>	42021	47171	42635	56215	52067	54297	28101
Satisfaction with democracy in country	<b>Mean</b>	1.165	1.128	1.102	.989	.963	1.089	1.191
	<b>St. dev.</b>	.748	.760	.770	.779	.778	.780	.767
	<b>#obs</b>	40457	45023	40616	54035	50039	52599	27529
Feeling household's income nowadays	<b>Mean</b>	2.053	1.932	1.935	1.803	1.784	1.792	2.142
	<b>St. dev.</b>	.835	.884	.891	.911	.927	.925	.796
	<b>#obs</b>	40292	44922	42457	56102	51756	53974	27973
Perception of immigration	<b>Mean</b>	.948	.925	.953	.953	.927	1.000	1.064
	<b>St. dev.</b>	.675	.703	.701	.712	.707	.718	.691
	<b>#obs</b>	40119	44626	40460	53281	49378	51564	27469
Main source of household income <sup>3</sup>	<b>Mean</b>	-	.351	.321	.315	.356	.342	.337
	<b>St. dev.</b>	-	.477	.467	.464	.479	.474	.472
	<b>#obs</b>	-	47507	42990	56746	52456	54670	28219

In the Table 4.6 we summarize the variables we use in this paper because we consider influencing the placement on the group scale of the individual (socioeconomic characteristics). We report the mean, standard deviation and number of observations for each of the considered variables.

The religious individuals are 62% of the people, the average age in the sample is around 47, with only slight differences across years. We can also observe from the descriptive statistics that around 46% of the interviewed individuals are male. From the sample, we can obtain that the average years of education of the individuals are 12, which means that on average almost everyone has the secondary schooling completed. At the same time, we see that the trend in years of education is positive. It means that the schooling is increasing in time, except the last year (2014), what could be due to the sample composition in that year.

<sup>2</sup> Binary variable created for the interrelationships among variables analysis by means of the correlation matrix. The created variable takes 0 for non-religious individuals and 1 for the others. This variable is binary and non-categorical, what allows us to interpret the coefficients. The variable included in the model framework is the categorical one.

<sup>3</sup> Binary variable created for the interrelationships among variables analysis by means of the correlation matrix. The created variable takes 0 for wages as main source of household income and 1 for the others. This variable is binary and non-categorical, what allows us to interpret the coefficients. The variable included in the model framework is the categorical one.

With regard with the voting in the last elections, we obtain that around 70% of the people voted in the last elections. This percentage matches with the common participation rate in the elections in Europe.

If we look at the unemployment variable, which means being searching for job during at least 3 months, we obtain a percentage around 25%, while is true that this percentage slightly increased during the years 2010-2014 due to the huge global crisis.

Looking at the satisfaction variables, we can extract that on average people is satisfied with democracy (values around 1 with certain slight excess to both sides, not satisfied and very satisfied) and with the household income (values around 1.9 that means that on average people are coping on present income). In terms of perception of the immigration, the main idea is that immigrants do not influence with a very little bias to the opinion that immigrants make a country a worse place to live.

We can also observe that just a 67% of the people has the wages as the main source of income.

Table 4.7 shows the correlation coefficients among variables. It gives us the interrelationships among the variables selected in our study and the correlation relationship between these ones and the target variable.

What we can clearly see in terms of relationships between the target variable and the rest of the variables is that the strongest correlation appears in the ‘satisfaction with democracy in country’ variable. This correlation reaches around 0.1, what indicates us that the more satisfied with democracy an individual is, the higher probability to ‘considering herself in the right side of the ideology scale’. We can find the posterior highest correlations in ‘gender’, ‘religion’ and ‘ever unemployed and seeking work’, but this last one in the negative way. The negative correlation indicates us that an individual who has ever been ‘unemployed and seeking work’ has a higher probability to ‘consider herself in the left side of the ideology scale’. The rest of the variables are almost not correlated with the target variable, showing small correlation coefficients.

In terms of interrelationships among the variables included in our study, we can select from the sample the highest ones. These ones are in the ‘age’ variable as well. The older an individual is, the less years of education done and the more religious is. At the same time, the more years of education done, (i) the less income received from the social take care system, (ii) the more satisfaction with the income received, (iii) the better perception of immigration and (iv) the less religious the individual is.

Other remarkable relationship is that the more satisfied with democracy an individual is, the better feeling about household's income and the better perception of immigration.

The correlations we have remarked are the strongest ones. The rest are less important.

This empirical evidence is considerably in line with the literature concerning the factors driving the self-placement in the scale of ideology. Among the variables considered, the one that seems to make a more marked difference in terms of placement on groups scale is the satisfaction with democracy in the country.

At the same time, we can remark that the variable that seems to influence the other ones included in this study is the ‘years of education’ variable jointly with age, the satisfaction with democracy in country, the feeling about household's income nowadays and the perception of the immigration.

After having studied the empirical evidence extracted from the data and justifying the variables selected for our study, we are about to carry out our model framework analysis.

Table 4.7 Correlation matrix among variables

	Placement on groups scale	Religion	Voted last national election	Ever unemployed and seeking work > 3m	Satisfaction with democracy in country	Feeling household's income nowadays	Perception of Immigration	Main source of household income	Age	Years of education	
Placement on groups scale	1.000	0.1057	0.040	0.026	-0.058	0.104	0.047	-0.049	-0.022	0.022	-0.024
Religion	0.1057	1.000	0.0704	-0.0866	-0.0498	0.0015	-0.0888	-0.0282	0.0826	0.1365	-0.1368
Voted last national election	0.040	0.0704	1.000	-0.002	-0.032	0.062	0.088	0.011	0.033	0.287	0.097
Male	0.026	-0.0866	-0.002	1.000	0.016	0.047	0.080	0.021	-0.043	-0.042	0.042
Ever unemployed and seeking work > 3m	-0.058	-0.0498	-0.032	0.016	1.000	-0.087	-0.180	-0.001	0.020	-0.123	0.032
Satisfaction with democracy in country	0.104	0.0015	0.062	0.047	-0.087	1.000	0.293	0.238	-0.061	-0.025	0.100
Feeling household's income nowadays	0.047	-0.0888	0.088	0.080	-0.180	0.293	1.000	0.178	-0.084	-0.054	0.251
Perception of immigration	-0.049	-0.0282	0.011	0.021	-0.001	0.238	0.178	1.000	-0.234	-0.091	0.197
Main source of household income	-0.022	0.0826	0.033	-0.043	0.020	-0.061	-0.234	-0.084	1.000	0.446	-0.237
Age	0.022	0.1365	0.287	-0.042	-0.123	-0.025	-0.054	-0.091	0.446	1.000	-0.246
Years of education	-0.024	-0.1368	0.097	0.042	0.032	0.100	0.251	0.197	-0.237	-0.246	1.0000

## 5. An econometric model of the individual ideology

According to our data, the dependent variable (as we have explained in the previous section) is naturally ordered. The original data show the variable ‘lrscale’ as a scale with values from 0 to 10. The value 0 means that the individual considers herself totally to the left in the political ideological scale and the value 10 that she considers herself as totally to the right in that scale.

As we explained in the previous section, from the original variable that is available in the ESS data, we have created a new one called ‘lrgroup’ with a new scale that groups the categories in the original variable as follows:

- The value 0, representing left in the scale, groups the values 0-3 (inclusive) of the original scale.
- The value 1 represents center and includes the values 4-6 (inclusive) of the original variable.
- The value 2, representing right, groups the values 7-10 (inclusive) of the original scale.

The distributions of the original variable ‘lrscale’ and the new variable ‘lrgroup’ are detailed in the previous section (Tables 4.1 and 4.2).

As we can see in Table 4.2 (previous section), more than 20% of the individuals consider themselves in the left position in the ideological scale, and a similar percentage report to be to the right in the scale. More than half of the individuals consider themselves as center-ideology according to our new variable.

The dependent variable ‘lrgroup’ is naturally ordered but it does not have a quantitative meaning. That means that people considering themselves to the right in the ideological scale ( $\text{lrgroup}=2$ ) do not reflect they are twice ‘right-ideology’ than people considering themselves in the center ( $\text{lrgroup}=1$ ). However, of course, the variable has an ordinal meaning. Thus, we formulate an ordered response model with the aim to analyze the probability of being in a given value of the scale in terms of some sociodemographic characteristics.

### 5.1 Ordered response models

“The ordered responses are mutually exclusive and exhaustive, such as with pure multinomial data. The additional and special feature of an ordered response is that its answer categories can be ranked from low to high or vice versa. The main problem with these models is that the particular values assigned to the outcomes remain arbitrary as long as they preserve the order. This, in turn, implies that ordered responses do not have origins, or units of measurement, and that expectations, variances and covariances have not meaning”. (Wikelmann and Boes, 2009).

First, we need to define the single latent variable in our index model:<sup>4</sup>

$$y_i^* = x_i' \beta + u_i,$$

where  $x$  does not include an intercept. As  $y^*$  crosses a series of increasing unknown thresholds, we move up the ordering of alternatives. For example, in our case, for very low  $y^*$ , the individual considers herself on the left in the ideological scale, for  $\alpha_1 < y_i^* < \alpha_2$  the individual considers herself on the center in the ideological scale and for values of  $y_i^*$  higher than  $\alpha_2$  the individual considers herself on the right in the ideological scale.

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<sup>4</sup>The material of this subsection is almost word to word from pp. 519-520 “Microeconomics. Methods and applications” by A. Colin Cameron and Pravin K. Trivedi (2005).

In general, for an  $m$ -alternative ordered model we define

$$y_i = j \quad \text{if and only if} \quad \alpha_j < y_i^* < \alpha_{j+1} \quad j = 0, \dots, m$$

where it is understood that  $\alpha_0 = -\infty$  and  $\alpha_{m+1} = \infty$  to cover the entire real line. Hence, the number of unknown threshold parameters reduces to  $m$ . Then:

$$\begin{aligned} Pr[y_i = j|x; \theta] &= Pr[\alpha_j < y_i^* < \alpha_{j+1}] \\ &= Pr[\alpha_j < x_i' \beta + u_i < \alpha_{j+1}] \\ &= Pr[\alpha_j - x_i' \beta < u_i < \alpha_{j+1} - x_i' \beta] \\ &= F(\alpha_{j+1} - x_i' \beta) - F(\alpha_j - x_i' \beta) \end{aligned}$$

where  $\theta = (\alpha_1, \dots, \alpha_m, \beta')'$  and  $F$  is the cumulative distribution function (cdf) of  $u_i$ .

“Once a distribution function  $F(u)$  has been specified, the probability of a particular outcome is determined by the area under the density function between the relevant thresholds.” (Wikelmann and Boes, 2009).

In our case, the probability of observing  $y_i = center$  is the area under  $f(y_i^*)$  between  $\alpha_1$  and  $\alpha_2$  which we can see in Figures 5.1.1 and 5.1.2

Figure 5.1.1 Threshold mechanism in terms of  $y^*$

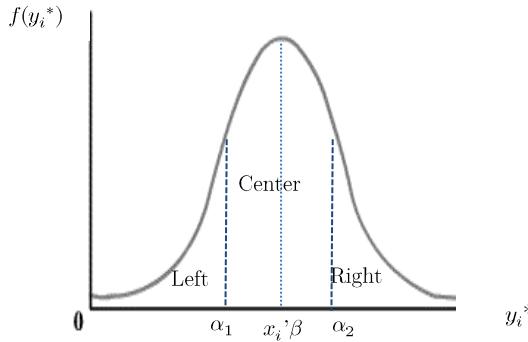


Figure 5.1.2 Threshold mechanism in terms of  $u$

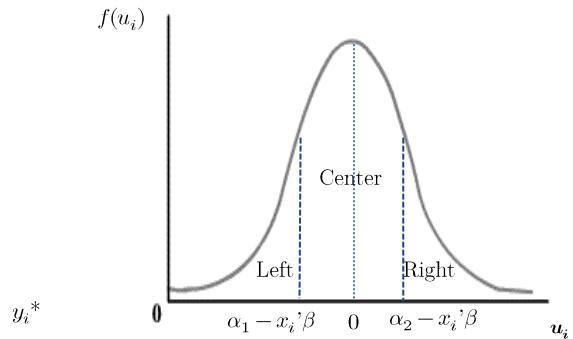


Figure 5.1.1 plots a symmetric density function  $f(y_i^*)$  with mean  $x_i' \beta$ . On the horizontal axis we display the latent variable  $y_i^*$ , which is divided into 3 intervals (left, center and right) according to our main variable. In Figure 5.1.2 we have basically the same representation of the threshold mechanism, but now in terms of the error term  $u_i$ . Therefore, the density function, conditional on the explanatory variables, has zero mean and the thresholds are determined by  $\alpha_j - x_i' \beta$ , for  $j = 1, 2$ .

The most commonly known models for ordered responses are the ordered probit model and the ordered logit model. For the ordered logit model,  $u$  is logistic distributed with  $F(z) = \frac{e^z}{(1+e^z)}$  and for the ordered probit model  $u$  is standard normal distributed and  $F(\cdot)$  is the standard normal cdf. In our case, we have chosen the ordered probit model, although the results from the logit model are very similar<sup>5</sup>.

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<sup>5</sup> Estimation results from the ordered logit model are available from the authors upon request.

## 5.2 The ordered probit model

As we have just said, the ordered probit model assumes that the error term follows a standard normal distribution,  $F(u_i) = \Phi(u_i)$ , being  $\Phi(u_i)$  the standard normal cdf evaluated at  $u_i$ .

Following the general ordered model and assuming that the error term follows a standard normal distribution, probabilities can be written as<sup>6</sup>:

$$P(y_i = 0|x; \theta) = Pr(y^* \leq \alpha_1) = \Phi(\alpha_1 - x_i' \beta)$$

$$P(y_i = 1|x; \theta) = Pr(\alpha_1 < y^* \leq \alpha_2) = \Phi(\alpha_2 - x_i' \beta) - \Phi(\alpha_1 - x_i' \beta)$$

...

$$P(y_i = m|x; \theta) = Pr(y^* > \alpha_m) = 1 - \Phi(\alpha_m - x_i' \beta)$$

That implies a general response probability as:

$$P(y_i = j|x; \theta) = \Phi(\alpha_{j+1} - x_i' \beta) - \Phi(\alpha_j - x_i' \beta).$$

With general variance  $\sigma^2$ , the probabilities would be given by:

$$P(y_i = j|x; \theta) = \Phi\left(\frac{\alpha_{j+1} - x_i' \beta}{\sigma}\right) - \Phi\left(\frac{\alpha_j - x_i' \beta}{\sigma}\right).$$

and we see that only the ratios  $\frac{\alpha_j}{\sigma}$  and  $\frac{\beta}{\sigma}$  are identified. “If we multiply each of the parameters  $(\alpha, \beta, \sigma)$  by a constant  $c$ , this constant cancels out in the ratios and all probabilities remain unchanged. Hence, we need a normalization to identify the parameters and we solve by issue setting  $\sigma = 1$ .” (Wikelmann and Boes, 2009).

### 5.2.1 Estimation

“The parameters  $\alpha$  and  $\beta$  can be estimated  $(\alpha, \beta)$  by maximum likelihood. For each  $i$ , the log-likelihood function is

$$\begin{aligned} l_i(\alpha, \beta) = & 1[y_i = 0] \log[\Phi(\alpha_1 - x_i' \beta)] + 1[y_i = 1] \log[\Phi(\alpha_2 - x_i' \beta) - \Phi(\alpha_1 - x_i' \beta)] + \dots + \\ & + 1[y_i = m] \log[1 - \Phi(\alpha_m - x_i' \beta)] \end{aligned}$$

This log-likelihood function is well behaved, and many statistical packages routinely estimate ordered probit models” (Wooldridge, 2002).

“ML estimation of the parameters yields consistent, asymptotically efficient and asymptotically normally distributed estimators. We can use Likelihood Ratio (LR), Wald and Score tests to test for general restrictions and the invariance property together with the Delta method<sup>7</sup> for estimation and inference of predicted probabilities, odds ratios, or marginal probability effects.” (Wikelmann and Boes, 2009).

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<sup>6</sup> The ordered probit model has been extracted from page 504-505 “Econometric analysis of cross section and panel data” by Jeffrey M. Wooldridge (2002).

<sup>7</sup> “Delta method can be used to obtain the distribution of a nonlinear combination of parameters and hence form confidence intervals or regions” (Cameron and Trivedi, 2005). We can also use this method to construct the estimated asymptotic variance and covariance matrix for the estimates of the marginal effects (Greene, 2012).

### 5.2.2 Marginal probability effects

The marginal effect of a change of the  $k$ -th element in  $x$  on the probability of choosing the alternative  $j$  can be obtained by taking first derivatives for continuous variables or by taking differences in probabilities in the case of discrete variables.

For discrete variables, for example a binary indicator  $x_k$ , the marginal probability effect can be calculated as:

$$MPE_{jk} = \Pr(y_i = j | x, x_k = 1) - \Pr(y_i = j | x, x_k = 0) \quad (\text{Williams, 2016})$$

Now, for continuous variables, the marginal probability effect can be calculated as (Wooldridge, 2002):

$$MPE_{0k} = \frac{\partial \Pr(y_i = 0 | x; \theta)}{\partial x_k} = -\beta_k [\phi(\alpha_1 - x' \beta)]$$

$$MPE_{mk} = \frac{\partial \Pr(y_i = m | x; \theta)}{\partial x_k} = \beta_k [\phi(\alpha_m - x' \beta)]$$

$$MPE_{jk} = \frac{\partial \Pr(y_i = j | x; \theta)}{\partial x_k} = \beta_k [\phi(\alpha_j - x' \beta) - \phi(\alpha_{j+1} - x' \beta)] \quad 0 < j < m$$

being  $\phi(z) = \frac{d\phi}{dz}$ , the standard normal pdf evaluated at  $z$ .

As we can see, the sign of the effect of the variable  $x_k$  is the opposite of the sign of the coefficient associated to that variable ( $\beta_k$ ) for the first alternative ( $j=0$ ) and the same for the last alternative ( $j=m$ ) because  $\phi(z) \geq 0$ . For any alternative  $0 < j < m$  the sign of the effect could have the same or the opposite sign depending on the sign of difference of  $[\phi(\alpha_j - x' \beta) - \phi(\alpha_{j+1} - x' \beta)]$ .

“In general, the MPE’s are functions of the covariates and therefore vary across individuals. In order to calculate average marginal probability effects (AMPE’s) we have to take expectations with respect to  $x$ , which is estimated consistently by replacing  $\beta$  by its ML estimate  $\hat{\beta}$  and averaging over sample. Apart from calculating average effects, we can also report the effects evaluated at the average or other interesting values, and thereby obtain the effect for an individual with specific characteristics” (Wikelmann and Boes, 2009).

We have decided to calculate the average marginal effects instead of conditional marginal effects. Nevertheless, with very large sample sizes, both alternatives provide very similar results.

### 5.3 Estimation results

In this section, we formulate an estimate an ordered probit model for our dependent variable (lrgroup, the 3-values scaled political ideology) in terms of a set of explanatory variables regarding sociodemographic characteristics.

We estimate two models: the first one considers the vector of explanatory variables, composed of the socio-demographic factors described in the previous section, and the second one also includes interactions between

some of them. We present the estimation results for Europe<sup>8</sup> as well as only for Spain. We then compare both models to know if there is any difference between the average behavior of Europeans and Spaniards.

The explanatory variables we have chosen are: year<sup>9</sup> (2004, 2006, 2008, 2010 and 2012), country group (Nordic, South, East and Center), religion (non-religious, Christian, Jewish, Islamic and other religions), an indicator of whether the person voted in the last elections, gender, unemployment, satisfaction with democracy, feeling about household's income, immigration's opinion, source of household's incomes, age and years of education. Reader can have a complete description of each variable on the previous section.

In the second model, authors have considered, besides the variables above mentioned, the following interactions assuming the special relationship between these variables and their importance to our model: unemployment & satisfaction with democracy, vote & years of education, vote & feeling about household's income, religion & age, unemployment & vote and gender & age.

In Tables 5.3.4 and 5.3.7, we report the results of the estimated models with the estimated coefficients and standard errors, for Europe and Spain, respectively. In each table, we offer the results for both models, with and without interactions between variables. From these tables we can see whether the explanatory variables are statistically significant. The sign of the estimated coefficients allows us to see how the variables affect to our dependent variable (with respect to the reference category considered for those variables). For example, if we look at Table 5.3.4, we can see that the category 'Christian' of the variables related to religion has a coefficient of 0.247 and it is significant at 1%. As we have just explained, that positive coefficient indicates us that considering oneself as Christian has a negative impact of considering herself in the left side of the scale (the first alternative) and a positive impact of considering herself in the right side of the ideological scale (the last alternative) with respect to the reference category in religion that is being non-religious. The sign of the effect of being Christian in the probability of considering oneself in the center of the ideological scale is unknown with only this information. To know that effect's sign, we should go to evaluate the average marginal effect (in this example, Table 5.3.5, column 3).

According to the results for Europe (Table 5.3.4), all variables except 2014 (year) and East (country group) are significant at 1% and in the model with interactions every interaction is also significant except Islamic & age (Religion & age).

The estimation for Spain (Table 5.3.7) is different and there are more variables non-significant which could be explained, among other factors by the fact that the number of observations is lower. These non-significant variables are: 2006 and 2008 (year), gender, very satisfied in democracy (satisfaction in democracy), difficult and coping on present incomes (feeling about household incomes), household's incomes and years of education. Islamic (religion), living comfortably with present incomes and age are significant at 5% and the rest of variables are significant at 1%. In the model with interactions, no interaction is significant except unemployment & vote that is significant at 5%.

From the ordered probit estimated coefficients, we cannot say anything about the numerical value of the marginal effects of the explanatory variables on the probability of the different choice alternatives. We have calculated the average marginal effects, to give us a chance to understand the quantitative effect of the different variables. In Tables 5.3.5 and 5.3.6, we report the average marginal effects for the models with and

<sup>8</sup> In the case of Europe we have estimated the two models with and without Spain trying to take out the effect of Spain but we have obtained similar results, so we have finally decided to include the model of Europe including Spain. The estimation results excluding Spain from the sample are available from the authors upon request.

<sup>9</sup> Authors have chosen to study in the model the period between 2004 and 2012 because in the first round of the survey (2002) most explanatory variable did not appear and the appeared for the first time in the second round (2004).

without interactions for Europe. In Tables 5.3.8 and 5.3.9, we offer the same information for the models for Spain.

In each table, we have four columns. The first column indicates us the different variables we have studied. The second one gives us the average marginal effect of each variable on the probability of the alternative ‘considering herself in the left-side of the political ideological scale’. Column 3 considers the average marginal effects on the probability of being in the center in the ideology and column 4 considers being to the right in the ideological scale. Of course, we can say that the estimated effects in column 2 and column 4 must have opposite signs.

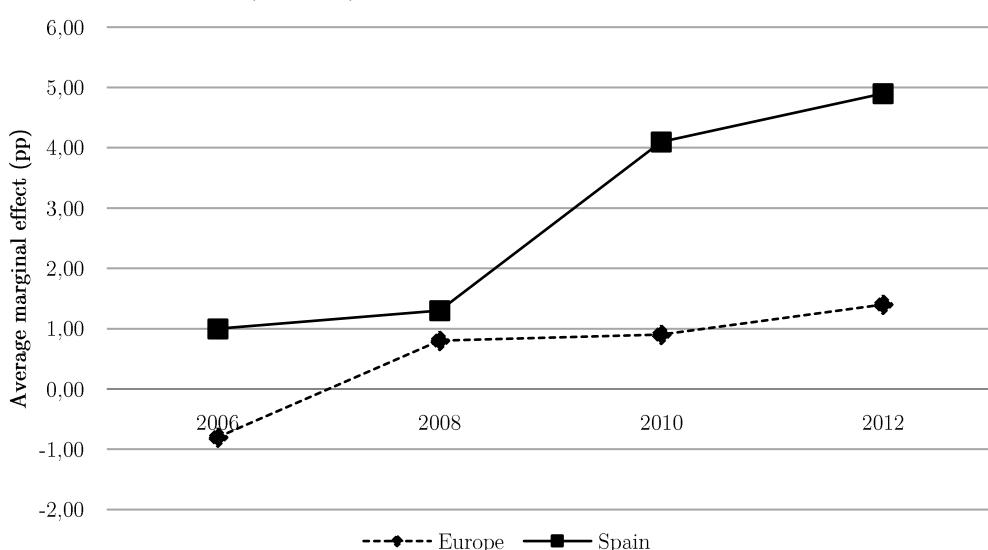
If we go back to our previous example of the effect of reporting to be Christian in the probability of considering oneself in the left, center or right in the ideological scale, we should go to the table of marginal effects and observe the sign of each effect. If we look at the figures in Table 5.3.5 and the average marginal effect of reporting to be Christian, we observe these different coefficients: -0.071, -0.005 and 0.076. That means that considering oneself as Christian decreases the probability of considering oneself as left-ideology and center-ideology in 7.1 and 0.5 percentage points respectively and increases the probability of considering herself as right in the ideological scale in 7.6 percentage points. Those probabilities are compared to considering herself as non-religious and keeping all other variables constant (*ceteris paribus*).

Now that we have explained how to read to the figures in the tables, we summarize the main results from our models and the variables considered. To make it easier to the reader, we have created different graphs reporting the average marginal effects on the model with interactions and we have compared the results for Europe and Spain. As we have explained, each marginal effect must be read according to the reference category in each variable.

To analyze these effects, we have focused on the average marginal effect of the explanatory variables on the probability of considering oneself on the right in the ideological scale in models with interactions between variables (Table 5.3.5, column 4, for Europe and Table 5.3.8, column 4, for Spain) and after explaining these effects we will discuss the differences between these models and the models with interactions between variables.

**Year (Ref. 2004):** In Figure 5.3.1, we can see that there is a positive and increasing marginal effect over years from 2004 to 2012, which reflects the evolution of the ideology to the right placement on the ideological scale. This effect is bigger in Spain than in Europe.

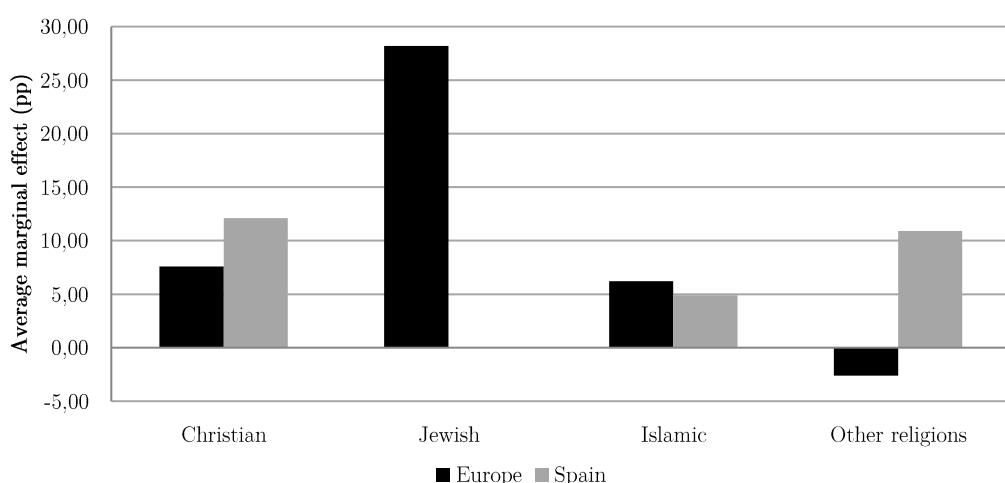
**Figure 5.3.1 Average marginal effect of year on the probability of considering oneself on the right in the ideological scale (Ref. 2004)**



Country group (Ref. Nordic): The probability of considering oneself on the right in the ideological scale decreases 9.3 percentage points if the individual lives in one southern country and increases 7.6 percentage points if the individual lives in a center country with respect to the situation where the individual lives in a Nordic country. The effect in Eastern countries is non-significant.

Religion (Ref. non-religious). As we can see in Figure 5.3.2, the marginal effects are similar in Spain and Europe regarding being Christian or Islamic and tell us that the probability of considering oneself on the right in the ideological scale increases if the individual is Christian (7.6 percentage points in Europe and 12.1 percentage points in Spain) or if the individual is Islamic (6.2 percentage points in Europe and 4.9 percentage points in Spain but being non-significant) with respect to a non-religious individual. Spain has no data to evaluate the effect of being Jewish and the effect of being of other religion is non-significant. These results are in line with Linz and Darias (1986), who noticed that individuals who consider themselves believers are more conservatives than other individuals who do not consider themselves believers.

**Figure 5.3.2 Average marginal effect of religion on the probability of considering oneself on the right in the ideological scale (Ref. non-religious)**



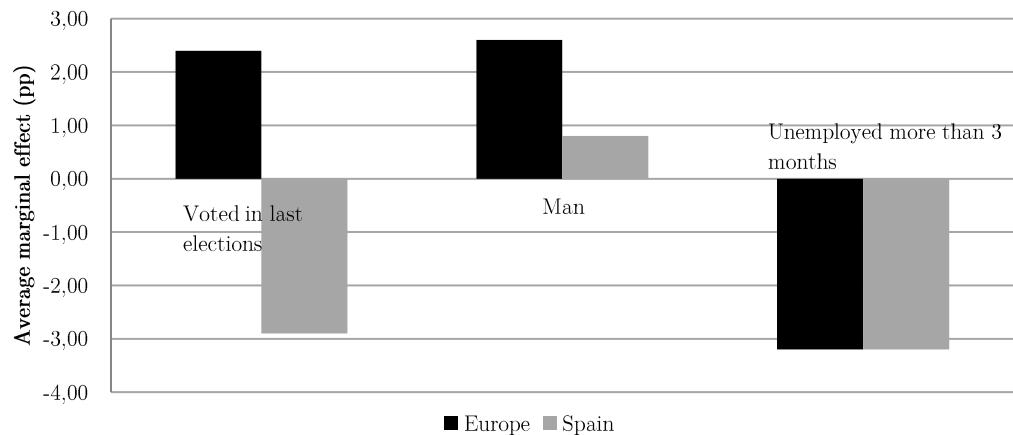
Vote: The probability of considering oneself on the right in the ideological scale increases in Europe 2.4 percentage points if the individual has voted in the last elections and decreases 2.9 percentage points in Spain if voted in the last elections. It is really interesting that both models have given us two results completely different regarding the effect of vote. Both results are significant at 1%. One explanation about this difference between Spain and Europe could be that in Spain, in the years we have studied, there was not a party that really represented interests of people with left ideology or if it existed, maybe did not have enough votes to play an important role on Parliament. One proof of this hypothesis could be the emergence of new political parties situated on the left ideological scale like ‘Podemos’<sup>10</sup>. It could be interesting to know how this effect could change in the next years and study if this new party (or other ones new) has been able to mobilize those people who consider themselves on the left in the ideological scale but did not vote in the last elections.

Gender: The probability of considering on the right in the ideological scale in Europe is other things equal, 2.6 percentage points higher for males. In Spain, the result is non-significant so we are not able to compare the effects between Europe and Spain. Eysenck (1964) noticed that women were more conservative than men were. This result differs from ours and the main reason could be that Eysenck’s study was made in 1964 and women’s role has changed a lot over these 50 years, making them more progressives comparing to the sixties.

<sup>10</sup> According to Centro de Estudios Sociológicos (CIS) N° 3126 “Postelectoral Elecciones generales 2015” (January 2016) 26.3% of individuals who said they did not vote on last elections answered the party which was closer with their ideology was Podemos. In this study we can also see that individuals who voted Podemos in last elections consider themselves as left-ideology (3.15 in the ideological scale from 1 to 10, considering 1 as totally left-ideology and 10 as totally right in the ideological scale)

Unemployment: If our individual has ever been unemployed and seeking for work for a period longer than three months, the probability of considering herself as the right in the ideological scale is, other things equal, 3.2 percentage points lower than in the case of individuals that have not been in that situation for Europe and Spain. Both results are significant at 1%. This evidence that people who have been unemployed consider themselves more on the left side of the ideological scale can be explained by the fact that left parties are usually more protective with workers and right parties are usually more liberal with labor topics.

**Figure 5.3.3 Average marginal effects of vote, gender and unemployment on the probability of considering oneself on the right in the ideological scale**



Satisfaction with democracy (Ref. Not satisfied): If the individual is satisfied with democracy, the probability of considering herself on the right in the ideological scale increases in Europe and Spain (5.9 and 3.5 percentage points respectively) with respect to those who are not satisfied with democracy. If the individual answers that she is very satisfied with democracy, the probability of considering herself on right ideology increases in Europe 10.5 percentage points and in Spain the effect is non-significant. This non-significance in Spain could be explained by historical reasons. Spain lived in right-wing dictatorship from 1939 to 1975 and maybe some people who supported that regime (we suppose that they consider themselves on the right in the ideological scale) are not satisfied with democracy nowadays.

Feeling about household's income (Ref. Very difficult on present income): In Europe, other things equal, the better the individual feels with the household's present income, the higher is the probability that she reports to be to the right in the ideological scale. The effects with respect to an individual who lives very difficult on present incomes are the following: an increase of 1.4 percentage points if the individual lives difficult with present incomes, 2.7 percentage points if she lives coping on present incomes and 4.9 percentage points if she lives comfortably with present incomes. In Spain the only significantly result shows that individuals living comfortably with present income increase the probability of considering themselves on right ideology 3.4 percentage points with respect to individuals living with very difficulties on present incomes. This result could be explained because left parties advocate to increase government intervention in order to get a better wealth redistribution while right-parties trust in a less-interventionist government.

Immigrations' opinion (Ref. Immigrants make a worse place to live): In this variable, results in Europe and Spain are very similar and significant at 1%. If the individual thinks that immigrants do not impact on the place to live, the probability of considering on the right in the ideological scale decreases in Europe and Spain 4.5 percentage points and 4.9 percentage points respectively with respect to an individual who answers immigrants make a worse place to live. The effect is higher for individuals answering immigrants make a better place to live. In this case, the probabilities of considering themselves on the right in the ideological scale decreases 8.6 percentage points and 7.6 percentage points in Europe and Spain respectively with respect to individuals who answer immigrant make a worse place to live. These results are significant at 1%.

Household's incomes (Ref. Wages, investment, and savings): In Europe, the probability of considering oneself on the right side of the ideological scale decreases 1.5 and 2.5 percentage points if the main source of income comes from pensions and government benefits respectively, with respect to income coming from savings, wages and investment. In Spain, the results are not significant so we cannot compare Europe and Spain.

Age: The probability of considering oneself on the right in the ideological scale has a null effect on the model in Europe and increases 0.1 percentage points in Spain per each additional year. Gonzalez and Arias (1998) also noticed the fact that old people are more conservative than young people are.

Years of education: In this case, we can only analyze Europe because results in Spain are not significant. The probability of considering oneself on the right in the ideological scale decreases 0.3 percentage points per each additional year of education.

If we study now the models with interactions between variables, we can see that by estimating this new model with interactions between variables we have obtained a very similar coefficient in each variable and only find slight changes in the marginal effects of different variables. We can also check these results in Table 5.3.6 for Europe and Table 5.3.9 for Spain, in column 4 in both cases.

In this analysis, we have only focused on the effect of considering oneself on the right in the ideological scale but we could also have analyzed the effect of considering oneself on the left in the ideological scale or in the center in the ideological scale. The results of considering oneself on the left in the ideological scale would be with opposite sign than results we have analyzed of considering oneself on the right in the ideological scale.

Table 5.3.4 Determinants of political ideology (Europe 2004-2014) Ordered probit estimation

Explanatory variable	Model 1. Simplified model	Model 2. Interactions between variables
	Coefficient (Std. error)	Coefficient (Std. error)
<b>Year (Ref: 2004)</b>		
2006	-0.026 (0.009) ***	-0.026 (0.009) ***
2008	0.026 (0.009) ***	0.024 (0.009) ***
2010	0.028 (0.009) ***	0.027 (0.009) ***
2012	0.045 (0.009) ***	0.043 (0.009) ***
2014	-0.005 (0.010)	-0.005 (0.010)
<b>Country group (Ref: Nordic)</b>		
South	-0.298 (0.010) ***	-0.297 (0.010) ***
East	-0.004 (0.009)	-0.001 (0.009)
Center	-0.240 (0.008) ***	-0.242 (0.008) ***
<b>Religion (Ref: Non-religious)</b>		
Christian	0.247 (0.005) ***	0.051 (0.015) ***
Jewish	0.803 (0.021) ***	1.001 (0.054) ***
Islamic	0.203 (0.015) ***	0.157 (0.039) ***
Other religions	-0.096 (0.034) ***	-0.330 (0.096) ***
<b>Vote</b>	0.076 (0.006) ***	0.162 (0.026) ***
<b>Man</b>	0.081 (0.005) ***	0.175 (0.014) ***
<b>Unemployed</b>	-0.102 (0.006) ***	0.005 (0.013)
<b>Satisfaction in democracy (Ref: Not satisfied)</b>		
Satisfied	0.203 (0.007) ***	0.225 (0.008) ***
Very satisfied	0.341 (0.007) ***	0.375 (0.008) ***
<b>Feeling about household's income (Ref: Very difficult on present income)</b>		
Difficult on present income	0.048 (0.011) ***	0.016 (0.018)
Coping on present income	0.089 (0.011) ***	0.066 (0.017) ***
Living comfortably on present income	0.157 (0.012) ***	0.110 (0.019) ***
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>		
Immigrants don't impact	-0.137 (0.006) ***	-0.137 (0.006) ***
Immigrants make a better place to live	-0.277 (0.008) ***	-0.276 (0.008) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>		
Pensions	-0.037 (0.008) ***	-0.047 (0.008) ***
Government benefits	-0.081 (0.012) ***	-0.085 (0.012) ***
<b>Age</b>	-0.001 (0.000) ***	-0.002 (0.000) ***
<b>Years of education</b>	-0.012 (0.001) ***	-0.003 (0.001) **
<b>Unemployed &amp; satisfaction with democracy (Ref: Not unemployed or not satisfied with democracy)</b>		
Unemployed & satisfied with democracy		-0.067 (0.014) ***
Unemployed & very satisfied with democracy		-0.121 (0.015) ***
<b>Vote &amp; Years of education</b>		-0.010 (0.002) ***
<b>Vote &amp; feeling about household's income (Ref: No vote or very difficult in present moment)</b>		
Vote & Difficult on present income		0.052 (0.023) **
Vote & coping on present income		0.043 (0.021) **
Vote & living comfortably on present income		0.072 (0.023) ***
<b>Religion &amp; age (Ref: Non-religious)</b>		
Christian		0.004 (0.000) ***
Jewish		-0.004 (0.001) ***
Islamic		0.001 (0.001)
Other religions		0.005 (0.002) **
<b>Unemployed &amp; vote</b>		-0.054 (0.012) ***
<b>Man &amp; age</b>		-0.002 (0.000) ***
Number of observations	206832	206832
Wald test	9797.74***	10098.50***
Pseudo R2	0.0245	0.0255

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

**Table 5.3.5 Determinants of political ideology (Europe 2004-2014)**

Average marginal effects based on the simplified model

Explanatory variable	Average marginal effects on $Pr(lrgroup = 0 x)$	Average marginal effects on $Pr(lrgroup = 1 x)$	Average marginal effects on $Pr(lrgroup = 2 x)$
	$dy/dx$ (Std. error)	$dy/dx$ (Std. error)	$dy/dx$ (Std. error)
<b>Year (Ref: 2004)</b>			
2006	0.007 (0.003) ***	0.001 (0.000) ***	-0.008 (0.003) ***
2008	-0.007 (0.002) ***	-0.001 (0.000) ***	0.008 (0.003) ***
2010	-0.008 (0.002) ***	-0.001 (0.000) ***	0.009 (0.003) ***
2012	-0.013 (0.002) ***	-0.002 (0.000) ***	0.014 (0.003) ***
2014	0.001 (0.003)	0.000 (0.000)	-0.001 (0.003)
<b>Country group (Ref: Nordic)</b>			
South	0.084 (0.003) ***	0.008 (0.001) ***	-0.093 (0.003) ***
East	0.001 (0.002)	0.000 (0.001)	0.001 (0.003)
Center	0.066 (0.002) ***	0.009 (0.001) ***	0.076 (0.002) ***
<b>Religion (Ref: Non-religious)</b>			
Christian	-0.071 (0.002) ***	-0.005 (0.000) ***	0.076 (0.002) ***
Jewish	-0.181 (0.003) ***	-0.101 (0.005) ***	0.282 (0.008) ***
Islamic	-0.060 (0.004) ***	-0.002 (0.001) ***	0.062 (0.005) ***
Other religions	0.031 (0.011) ***	-0.005 (0.002) **	-0.026 (0.009) ***
<b>Vote</b>	-0.022 (0.002) ***	-0.003 (0.000) ***	0.024 (0.018) ***
<b>Man</b>	-0.023 (0.001) ***	-0.003 (0.000) ***	0.026 (0.016) ***
<b>Unemployed</b>	0.029 (0.002) ***	0.002 (0.000) ***	-0.032 (0.017) ***
<b>Satisfaction in democracy (Ref: Not satisfied)</b>			
Satisfied	-0.061 (0.002) ***	0.002 (0.000) ***	0.059 (0.002) ***
Very satisfied	-0.098 (0.002) ***	-0.007 (0.000) ***	0.105 (0.002) ***
<b>Feeling about household's income (Ref: Very difficult on present income)</b>			
Difficult on present income	-0.014 (0.003) ***	-0.000 (0.000) **	0.014 (0.003) ***
Coping on present income	-0.026 (0.003) ***	-0.001 (0.000) ***	0.027 (0.003) ***
Living comfortably on present income	-0.045 (0.002) ***	-0.004 (0.000) ***	0.049 (0.004) ***
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>			
Immigrants don't impact	0.036 (0.002) ***	0.008 (0.000) ***	-0.045 (0.002) ***
Immigrants make a better place to live	0.078 (0.002) ***	0.009 (0.000) ***	-0.087 (0.002) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>			
Pensions	0.010 (0.002) ***	0.001 (0.000) ***	-0.012 (0.002) ***
Government benefits	0.023 (0.003) ***	0.002 (0.000) ***	-0.025 (0.004) ***
<b>Age</b>	0.000 (0.000) ***	0.000 (0.000) ***	-0.000 (0.000) ***
<b>Years of education</b>	0.003 (0.000) ***	0.000 (0.000) ***	-0.003 (0.000) ***
Number of observations	206832	206832	206832

$dy/dx$  for factor levels is the discrete change from the base level.

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

**Table 5.3.6 Determinants of political ideology (Europe 2004-2014)**  
 Average marginal effects based on the model with interactions between variables

Explanatory variable	Average marginal effects on $Pr(lrgroup = 0 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 1 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 2 x)$ $dy/dx$ (Std. error)
<b>Year (Ref: 2004)</b>			
2006	0.007 (0.003) ***	0.001 (0.000) ***	-0.008 (0.003) ***
2008	-0.007 (0.002) ***	-0.001 (0.000) ***	0.008 (0.003) ***
2010	-0.007 (0.002) ***	-0.001 (0.000) ***	0.008 (0.003) ***
2012	-0.012 (0.002) ***	-0.002 (0.000) ***	0.014 (0.003) ***
2014	0.001 (0.003)	0.000 (0.000)	-0.002 (0.003)
<b>Country group (Ref: Nordic)</b>			
South	0.084 (0.003) ***	0.008 (0.001) ***	-0.092 (0.003) ***
East	0.000 (0.002)	0.000 (0.001)	0.000 (0.003)
Center	0.067 (0.002) ***	0.009 (0.001) ***	0.076 (0.002) ***
<b>Religion (Ref: Non-religious)</b>			
Christian	-0.071 (0.002) ***	-0.004 (0.000) ***	0.076 (0.002) ***
Jewish	-0.182 (0.003) ***	-0.101 (0.005) ***	0.283 (0.008) ***
Islamic	-0.060 (0.005) ***	-0.001 (0.001) *	0.061 (0.005) ***
Other religions	0.024 (0.012) **	-0.004 (0.002) *	-0.019 (0.010) **
<b>Vote</b>	-0.022 (0.002) ***	-0.003 (0.000) ***	0.025 (0.018) ***
<b>Man</b>	-0.023 (0.001) ***	-0.002 (0.000) ***	0.026 (0.016) ***
<b>Unemployed</b>	0.029 (0.002) ***	0.005 (0.000) ***	-0.034 (0.018) ***
<b>Satisfaction in democracy (Ref: Not satisfied)</b>			
Satisfied	-0.062 (0.002) ***	0.001 (0.000) ***	0.061 (0.002) ***
Very satisfied	-0.098 (0.002) ***	-0.008 (0.000) ***	0.106 (0.002) ***
<b>Feeling about household's income (Ref: Very difficult on present income)</b>			
Difficult on present income	-0.016 (0.003) ***	-0.000 (0.000) **	0.017 (0.003) ***
Coping on present income	-0.029 (0.003) ***	-0.001 (0.000) ***	0.030 (0.003) ***
Living comfortably on present income	-0.046 (0.003) ***	-0.005 (0.000) ***	0.051 (0.004) ***
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>			
Immigrants don't impact	0.036 (0.002) ***	0.008 (0.000) ***	-0.045 (0.002) ***
Immigrants make a better place to live	0.077 (0.002) ***	0.009 (0.000) ***	-0.086 (0.002) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>			
Pensions	0.013 (0.002) ***	0.001 (0.000) ***	-0.015 (0.002) ***
Government benefits	0.024 (0.003) ***	0.002 (0.000) ***	-0.026 (0.004) ***
<b>Age</b>	0.000 (0.000) ***	0.000 (0.000) ***	-0.000 (0.000) ***
<b>Years of education</b>	0.003 (0.000) ***	0.000 (0.000) ***	-0.003 (0.000) ***
Number of observations	206832	206832	206832

$dy/dx$  for factor levels is the discrete change from the base level.

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

Table 5.3.7 Determinants of political ideology (Spain 2004-2012) Ordered probit estimation

Explanatory variable	Model 1. Simplified model	Model 2. Interactions between variables
	Coefficient (Std. error)	Coefficient (Std. error)
<b>Year (Ref: 2004)</b>		
2006	0.050 (0.044)	0.049 (0.044)
2008	0.063 (0.043)	0.061 (0.043)
2010	0.179 (0.044) ***	0.178 (0.044) ***
2012	0.212 (0.046) ***	0.213 (0.046) ***
<b>Religion (Ref: Non-religious)</b>		
Christian	0.589 (0.030) ***	0.507 (0.080) ***
Islamic	0.285 (0.126) **	0.180 (0.312)
Other religions	0.544 (0.193) ***	0.338 (0.660)
<b>Vote</b>	-0.121 (0.031) ***	0.014 (0.157)
<b>Man</b>	0.034 (0.026)	0.093 (0.071)
<b>Unemployed</b>	-0.142 (0.028) ***	-0.098 (0.075)
<b>Satisfaction in democracy (Ref: Not satisfied)</b>		
Satisfied	0.152 (0.036) ***	0.125 (0.046) ***
Very satisfied	0.041 (0.040)	0.002 (0.050)
<b>Feeling about household's income (Ref: Very difficult on present income)</b>		
Difficult on present income	0.089 (0.074)	0.148 (0.127)
Coping on present income	0.075 (0.072)	0.163 (0.122)
Living comfortably on present income	0.149 (0.075) **	0.271 (0.128) **
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>		
Immigrants don't impact	-0.194 (0.034) ***	-0.192 (0.034) ***
Immigrants make a better place to live	-0.323 (0.041) ***	-0.321 (0.041) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>		
Pensions	0.053 (0.042)	0.049 (0.042)
Government benefits	-0.015 (0.077)	-0.014 (0.077)
<b>Age</b>	0.002 (0.001) **	0.001 (0.002)
<b>Years of education</b>	0.003 (0.003)	0.000 (0.006)
<b>Unemployed &amp; satisfaction with democracy (Ref: Not unemployed or not satisfied with democracy)</b>		
Unemployed & satisfied with democracy		0.076 (0.071)
Unemployed & very satisfied with democracy		0.114 (0.077)
<b>Vote &amp; Years of education</b>		-0.03 (0.007)
<b>Vote &amp; feeling about household's income (Ref: No vote or very difficult in present moment)</b>		
Vote & Difficult on present income		-0.086 (0.154)
Vote & coping on present income		-0.122 (0.146)
Vote & living comfortably on present income		-0.166 (0.153)
<b>Religion &amp; age (Ref: Non-religious)</b>		
Christian		0.002 (0.002)
Islamic		0.002 (0.008)
Other religions		0.006 (0.018)
<b>Unemployed &amp; vote</b>		-0.146 (0.064)**
<b>Man &amp; age</b>		-0.001 (0.001)
Number of observations	7746	7746
Wald test	652.57***	659.53***
Pseudo R2	0.0450	0.0456

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

**Table 5.3.8 Determinants of political ideology (Spain 2004-2012)**

Average marginal effects based on the simplified model

Explanatory variable	Average marginal effects on $Pr(lrgroup = 0 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 1 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 2 x)$ $dy/dx$ (Std. error)
<b>Year (Ref: 2004)</b>			
2006	-0.017 (0.015)	0.006 (0.006)	0.010 (0.009)
2008	-0.021 (0.015)	0.008 (0.006)	0.013 (0.009)
2010	-0.060 (0.015) ***	0.019 (0.005) ***	0.041 (0.010) ***
2012	-0.070 (0.015) ***	0.021 (0.005) ***	0.049 (0.011) ***
<b>Religion (Ref: Non-religious)</b>			
Christian	-0.209 (0.011) ***	0.088 (0.006) ***	0.121 (0.006) ***
Islamic	-0.107 (0.045) **	0.059 (0.020) ***	0.049 (0.025) *
Other religions	-0.195 (0.061) ***	0.086 (0.011) ***	0.109 (0.050) **
<b>Vote</b>	0.039 (0.010) ***	-0.010 (0.002) ***	-0.029 (0.008) ***
<b>Man</b>	-0.011 (0.009)	0.003 (0.003)	0.008 (0.006)
<b>Unemployed</b>	0.047 (0.009) ***	-0.015 (0.003) ***	-0.032 (0.006) ***
<b>Satisfaction in democracy (Ref: Not satisfied)</b>			
Satisfied	-0.050 (0.012) ***	0.015 (0.004) ***	0.035 (0.008) ***
Very satisfied	-0.014 (0.014)	0.005 (0.005)	0.009 (0.009)
<b>Feeling about household's income (Ref: Very difficult on present income)</b>			
Difficult on present income	-0.030 (0.025)	0.010 (0.010)	0.019 (0.016)
Coping on present income	-0.025 (0.024)	0.009 (0.009)	0.016 (0.015)
Living comfortably on present income	-0.049 (0.025) *	0.016 (0.010) *	0.034 (0.016) **
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>			
Immigrants don't impact	0.061 (0.011) ***	-0.013 (0.002) ***	-0.049 (0.009) ***
Immigrants make a better place to live	0.106 (0.013) ***	-0.029 (0.004) ***	-0.076 (0.010) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>			
Pensions	-0.017 (0.014)	0.005 (0.004)	0.012 (0.010)
Government benefits	0.005 (0.026)	-0.002 (0.008)	-0.003 (0.017)
<b>Age</b>	-0.001 (0.000) **	0.000 (0.000) **	0.001 (0.000) **
<b>Years of education</b>	-0.001 (0.001)	0.000 (0.000)	0.001 (0.001)
Number of observations	7746	7746	7746

$dy/dx$  for factor levels is the discrete change from the base level.

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

**Table 5.3.9 Determinants of political ideology (Spain 2004-2012)**  
 Average marginal effects based on the model with interactions between variables

Explanatory variable	Average marginal effects on $Pr(lrgroup = 0 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 1 x)$ $dy/dx$ (Std. error)	Average marginal effects on $Pr(lrgroup = 2 x)$ $dy/dx$ (Std. error)
<b>Year (Ref: 2004)</b>			
2006	-0.017 (0.015)	0.006 (0.006)	0.010 (0.009)
2008	-0.021 (0.015)	0.008 (0.006)	0.013 (0.009)
2010	-0.059 (0.015) ***	0.019 (0.005) ***	0.041 (0.010) ***
2012	-0.070 (0.015) ***	0.021 (0.005) ***	0.049 (0.011) ***
<b>Religion (Ref: Non-religious)</b>			
Christian	-0.212 (0.012) ***	0.090 (0.007) ***	0.122 (0.006) ***
Islamic	-0.109 (0.054) **	0.060 (0.023) *	0.049 (0.032)
Other religions	-0.212 (0.072) ***	0.087 (0.016) ***	0.125 (0.076)
<b>Vote</b>	0.041 (0.010) ***	-0.012 (0.003) ***	-0.029 (0.008) ***
<b>Man</b>	-0.012 (0.009)	0.005 (0.003)	0.007 (0.006)
<b>Unemployed</b>	0.046 (0.009) ***	-0.015 (0.003) ***	-0.031 (0.006) ***
<b>Satisfaction in democracy (Ref: Not satisfied)</b>			
Satisfied	-0.051 (0.012) ***	0.017 (0.004) ***	0.034 (0.008) ***
Very satisfied	-0.015 (0.014)	0.007 (0.005)	0.008 (0.009)
<b>Feeling about household's income (Ref: Very difficult on present income)</b>			
Difficult on present income	-0.028 (0.026)	0.010 (0.010)	0.018 (0.016)
Coping on present income	-0.023 (0.025)	0.008 (0.009)	0.015 (0.016)
Living comfortably on present income	-0.048 (0.026) *	0.015 (0.009)	0.032 (0.016) **
<b>Immigration's opinion (Ref: Immigrants make a worse place to live)</b>			
Immigrants don't impact	0.061 (0.011) ***	-0.013 (0.002) ***	-0.048 (0.009) ***
Immigrants make a better place to live	0.105 (0.013) ***	-0.029 (0.004) ***	-0.076 (0.010) ***
<b>Household incomes (Ref: Wages, investment, savings)</b>			
Pensions	-0.016 (0.014)	0.005 (0.004)	0.012 (0.010)
Government benefits	0.005 (0.026)	-0.001 (0.008)	-0.003 (0.017)
<b>Age</b>	-0.001 (0.000) **	0.000 (0.000)	0.001 (0.000) **
<b>Years of education</b>	-0.001 (0.001)	0.000 (0.000)	0.001 (0.001)
Number of observations	7746	7746	7746

$dy/dx$  for factor levels is the discrete change from the base level.

\*\*\*, \*\*, \* indicate significance different from zero at the 1, 5 and 10 percent level, respectively.

## 6. Conclusions

In this paper, we have analyzed the political tendency of individuals from 2002 through 2014 and how the socio-political characteristics of individuals and the economic situation (in macroeconomic and microeconomic terms) could determine their political ideology. This proposal came up due to the change situation in terms of political ideology that we are attending in almost every European country with the emergence of new parties situated in both extremes of the ideological scale.

We have focused our analysis on the European and the Spanish level and we have compared between these two scenarios after developing our model framework. For that purpose, we have extracted data from the European Social Survey (ESS), conducted by the ERIC (European Research Infrastructure Consortium) in every European participating country, using the waves belonging to the selected periods and observing the political trend through the analysis of selected variables.

In the current project, we have picked up as our target variable the placement in the ideological scale since it is a considerably good proxy of the political ideology. According to Duch, Jeff and Armstrong (2008), who said that despite the weight of ideology in the voting-decision process differs across countries, it is one of the most important determinants in our last voting-decision.

The fact that our target variable is naturally ordered lead us to formulate and estimate an ordered probit model. We have based our conclusions in the marginal effects calculation. We have carried out four models, two of them for Europe and the other two for Spain, differentiating models with interactions among the explanatory variables or without interaction terms.

As explanatory variables in our model, we have included the individual's age, years of schooling, gender, the country group where the individual lives (Nordic, Southern, Eastern and Center countries), the individual's religiosity and the type of religion the individual belongs to, whether the individual voted in the last national elections or not, the perception an individual has about the immigration, whether the individual has been unemployed and seeking for job during more than 3 months, the income's source type, the feeling about the income received and how satisfied with democracy in the country the individual is.

We have found that models with and without interactions give us very similar results. Trying to compare the estimations for Europe and Spain, we have obtained very similar effects for most considered variables. The most important difference comes when we analyze the effect on ideology of the variable related to voting in the last elections. For the case of Europe, if the individual voted in the last elections, the probability that the individual considers herself on the right side of the ideological scale increases (*ceteris paribus*) 2.4 percentage points, while in the case of Spain it decreases 2.9 percentage points.

Our findings could be important in political science to study the socio-economic factors influencing individuals' ideology and to study its evolution over time. They could also be useful for political parties to help them about planning their electoral strategy depending on the profile they want to seduce according to a greater political affinity.

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## References

- Almond, G.A., and S. Verba.** (1989) *The civic culture: Political attitudes and democracy in Five nations.* Sage Publications.
- Alvarez, P.** (2015) *57% of Spaniards believe that they will not work according to their education level.* Edited by El País. [http://economia.elpais.com/economia/2015/10/30/actualidad/1446234123\\_613806.html](http://economia.elpais.com/economia/2015/10/30/actualidad/1446234123_613806.html) (accessed 07 09, 2016).
- Amemiya, T.** (1985) *Advanced Econometrics.* Havard University Press (Cambridge).
- Cameron, A.C., and P.K. Trivedi.** (2005) *Microeconometrics: Methods and Applications.* Cambridge University Press (Cambridge).
- Centro de Estudios Sociológicos (CIS).** (2016) *Postelectoral Elecciones generales 2015.* n. 3126.
- Curini, L., W. Jou, and V. Memoli.** (2011) "Satisfaction with democracy and the winner/loser debate: The role of policy preferences and past experience." *British Journal of Political Science*, n. 42(02), pp. 241–261.
- Diener, E., R. Inglehart, and L. Tay.** (2012) "Theory and validity of life satisfaction scales." *Social Indicators Research*, n. 112(3), pp. 497–527.
- Duch, Raymond M., May Jeff, and David A. Armstrong.** (2008) "A Strategic Ideological Vote." *Department of Politics and International Relations.*
- European Comission.** (2016) European Comission, Research and Innovation. [https://ec.europa.eu/research/infrastructures/index\\_en.cfm?pg=eric6#ess](https://ec.europa.eu/research/infrastructures/index_en.cfm?pg=eric6#ess) (accessed 05 26, 2016).
- European Commission.** (2016) *Eurostat.* <http://ec.europa.eu/eurostat/data/database> (accessed 06 16, 2016).
- European Social Survey.** (2013) *About the European Social Survey European Research Infrastructure.* 11 30, 2013. <http://www.europeansocialsurvey.org/about/> (accessed 05 26, 2016).
- Glaeser, E.L., G.A.M. Ponzetto, and A. Shleifer.** (2007) "Why does democracy need education?" *Journal of Economic Growth*, n. 12(2), pp. 77-99.
- González, M., and M. Darías.** (1998) "Predicción de la conducta de voto, personalidad y factores sociopolíticos." *Psicología política*, n. 17.
- Greene, W.** (2012) *Econometric Analysis.* 7<sup>th</sup> Edition. Pearson (Boston).
- Helliwell, J., R. Layard, and J. Sachs.** (2016) *World Happiness Report Update 2016.* Vol.I, 1<sup>st</sup> Edition. Rome, pp. 20-22.
- Levi Martin, John.** (2015) "What is ideology?" *Sociología, Problemas y Prácticas*, n. 77.
- Morales Domínguez, J.F.** (2013) "Introduction to the Monograph Political Psychology in Europe." *Psicología política*, n. 46.

- Norris, P., and R.F. Inglehart.** (2011) *Sacred and secular: Religion and politics worldwide*. 2<sup>nd</sup> Edition. Cambridge University Press (Cambridge).
- Sala, A.M.L.** (2005) "Inmigrantes y Estados: La Respuesta Política ante la Cuestión Migratoria." *Anthropos Research & Publications*.
- The World Bank.** (2016) *In*. <http://data.worldbank.org/indicator/SI.POV.GINI> (accessed 06 16, 2016).
- Van Deth, J.W., and M. Elff.** (2004) "Politicization, economic development and political interest in Europe." *European Journal of Political Research*, n. 43(3), pp. 477–508.
- Williams, M.** (2016) *Marginal effects for continuous variables*. University of Notre Dame (Indiana).
- Winkelmann, R., and S. Boes.** (2009) *Analysis of Microdata*. Berlin. Springer-Verlag.
- Wooldridge, J.W.** (2003) *Econometric analysis of cross section and panel data*. The MIT Press.