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Effort or Luck? Believing in the role of effort during the Spanish economic recession*

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Abstract

We explore the effect of the recent large unemployment shock in Spain on people's beliefs about the role of effort as a determinant of economic position. To do that, we use a series of Spanish public opinion surveys between 2010 and 2017, matched with regional-level unemployment data. We find that people have attributed a larger role to luck in the Spanish provinces where the unemployment rate increased more during the economic recession. This finding persists after controlling for a series of demographic, socio-economic and ideological individual-level variables. In addition, we find that poorer, lower educated individuals, and those who position themselves as more left-wing and "socialist" have adjusted their beliefs more, while individuals who identify as "conservative" have adjusted their beliefs less.

Keywords: Beliefs, Preferences for redistribution, Spanish economic recession.

JEL classification: D63, E60, D91.

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1 Introduction

People’s beliefs about the influence of effort on economic positions have been found to be an important determinant of their demand for redistribution. The larger the role people believe effort plays, the lower their demand for redistribution tends to be (Piketty, 1995; Fong, 2001; Alesina and Glaeser, 2004; Alesina and La Ferrara, 2005; Alesina and Angeletos, 2005; Bénabou and Tirole, 2006). The literature has documented some remarkable differences in the beliefs about the role of effort on both sides of the Atlantic Ocean. While sixty percent of American respondents of the World Value Survey say that the poor are lazy, for instance, only twenty-six percent of Europeans share the same belief (Alesina et al., 2001, p. 243).

In this paper, we explore how beliefs about the role of effort are associated with some demographic, socio-economic, and ideological variables in Spain, and we investigate whether and how the beliefs have been updated during the large unemployment shock caused by the recent economic recession. Spain is an interesting country to look at for at least two reasons. First, the nationally representative Survey on Public Opinion and Fiscal Policy developed by the Spanish Centre of Sociological Research (CIS)¹ collects information on the beliefs about the influence of effort on economic positions since 2010 by means of the same survey question. This permits us to monitor in a detailed and comparable way the evolution of these beliefs over the considered period. Second, while Spain as a country was heavily hit by the economic recession (at its peak in 2013, more than a quarter of the work force was unemployed and more than half of the work force below the age of 29), the unemployment rate in some provinces remained relatively stable. The combination of both factors allows the study of the effect of the province-level unemployment shock on the beliefs about the role of effort on the economic position achieved.

The paper fits in a recent empirical literature that studies how exogenous economic, political, and natural factors affect individual beliefs and preferences for redistribution. Di Tella et al. (2007) study the effect on beliefs of exogenously handing out land titles in a squatter settlement in Buenos Aires. Lucky squatters who receive land titles are found to report more materialistic and individualistic beliefs, such as the belief that money is important for happiness or the belief that one can be successful without the support of a large group. Interestingly,

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they find no statistically significant difference between the lucky and unlucky squatters with respect to the belief that people who put more effort end up in a better position than those who do not. Alesina and Fuchs-Schündeln (2007) look at the influence of the political regime and find a negative effect of the collective experience of living under a communist regime in East Germany on the beliefs that life achievements are determined by luck. Giuliano and Spilimbergo (2013) offer evidence that experiencing an economic recession, especially during early adult years, makes individuals become more supportive of redistribution, more left-wing, and more aware of the effects of luck on success. Addressing the impact of the economic recession, Olivera (2014) provides a cross-country comparison of preferences for redistribution, finding a strong positive effect of unemployment. More recently, Gualtieri et al. (2018) study the effect of a natural disaster and find a positive effect of the intensity of the 2009 L’Aquila earthquake in Italy on willingness to increase government intervention.

Our explained variable captures the beliefs of respondents about whether effort or luck-related variables have a larger influence on the economic position that people achieve. The distinction between factors within individual’s control (related to effort) and factors beyond their control (due to circumstances or luck) figures prominently in the literature on equality of opportunities.² Writers as Arneson (1989), Cohen (1989, 1990) and Roemer (1993) have argued that inequalities that originate in circumstances and bad luck can be considered unfair and should be compensated for by society, whereas inequalities that arise from different effort choices are considered as fair and therefore provide no ground for redistribution.³

There is a small empirical literature on where people draw the responsibility cut between effort and circumstances or luck factors, see Gaertner and Schokkaert (2012) for an overview. Although related and complementary, our focus on beliefs about the role of effort in this paper is different from questions about where to draw the responsibility cut. Indeed, individuals may be convinced that certain factors are within the individual’s control and should be rewarded,

²For a comprehensive overview of the topic, see Fleurbaey (2008); Roemer and Trannoy (2016); Ramos and Van de gaer (2016); Ferreira and Peragine (2015).

³Going back to the seminal work of Dworkin (1981a; 1981b), two types of luck are distinguished. *Option luck* refers to the uncertain decision outcomes that can be anticipated. *Brute luck*, on the other hand, relates to those eventualities we cannot forecast or avoid. The first kind of luck arguably implies a higher degree of responsibility for the individual than the second. Lefranc and Trannoy (2017) discuss the implications of these two different types of luck for the theory of equality of opportunity, as well as the influence of the timing of luck. Unfortunately, our data set does not allow us to make these distinctions in this paper.

but at the same time think that these factors play a minor role in explaining real-world income differences (Schokkaert and Truyts, 2017, p. 546). Whereas the literature on the responsibility cut deals with the former considerations, we focus here on the latter.

The paper is structured as follows. Section 2 presents three different perspectives taken in the literature to shed light on the process of belief formation and updating. These perspectives highlight different channels through which beliefs form and how the economic recession may affect them. In Section 3 we introduce the data set and discuss the key variable of our study that captures the individual belief about the role of effort as determinant of economic positions. Section 4 discusses the main results of our study and presents some sensitivity checks. Section 5 concludes.

2 Formation of beliefs about the role of effort

We discuss in this section three different perspectives that exist in the literature on how people form and update their beliefs about the role of effort.⁴ According to the first perspective, beliefs about the role of effort are formed through learning and observing the economic environment in a rather passive way. The second perspective considers beliefs as the result of a more active process of manipulation and indoctrination by other individuals or institutions. The agent believes what others want her to believe. The third perspective considers beliefs as the result of an (unconscious) process of belief manipulation by the agent herself. The agent believes what she wants to believe.

Learning. According to the first perspective, individuals are searching for the “true” role that effort plays in determining economic positions. A large number of social experiments with different effort levels would be required to understand their effect on the resulting economic outcomes. For a single individual, it is too costly to perform all these experiments (Piketty, 1995). The beliefs about the role of effort can therefore be interpreted as the outcome of an ongoing learning process based on the available and incomplete information. Because the beliefs about the role of effort may also affect the actions and learning opportunities of the individuals, several politico-economic equilibria may emerge in which different individuals can sustain different conclusions about the role played by effort.

⁴The classification is inspired by Bénabou and Tirole (2006, p. 703).

Piketty (1995) stresses the large (intergenerational) *persistence* of beliefs about the role of effort. His theoretical model shows how dynasties of individuals form beliefs about the role of effort based on their own income mobility experiences. Beliefs determine the desired effort level and tax rate of individuals, which then determine the social mobility of the individuals in the dynasty and, hence, how they form their beliefs about the role of effort. In the long run, some dynasties believe that effort determines their economic position, thus work very hard and have a low demand for redistribution. They consequently find that, indeed, their economic position is largely determined by their effort level. Other dynasties believe that luck determines their position, work less hard and vote for more redistributive policies, finding that their economic position is much less determined by their effort level. Piketty (1995, p. 575) describes how a large aggregate shock (such as the economic recession) may reveal new information that pushes dynasties to a new steady state of beliefs.

Schokkaert and Truyts (2017) focus on the role of *reference groups* in the learning process. According to their view, individuals form their beliefs about the role of effort based on what they observe in their own reference group. When reference groups are formed in an assortative way, members of different reference groups may sustain different beliefs about the role of effort. An aggregate shock with heterogeneous effects may lead to different belief dynamics in the reference groups. The authors show furthermore that long run changes in the social stratification underlying the reference group formation may also induce changes in the beliefs.⁵

Finally, Giuliano and Spilimbergo (2013) stress the so-called *impressionable years* hypothesis that states that core attitudes, beliefs and values crystallise during a period of great mental plasticity in early adulthood (18-25 years). This hypothesis leads to the prediction that events experienced during early adulthood are particularly influential and have long-run effects on belief formation. Almås et al. (2010) and Almås et al. (2017) provide more insights in the formation of fairness preferences. When entering adolescence, individuals develop their sense of fairness with respect to inequalities and the role of effort. Moreover, they find that adolescents with a low socio-economic status show

⁵Golman et al. (2016) study the reasons underlying a preference for belief consonance, the difficulties it presents within groups when uniformity is not granted, and the implications in terms of economic behaviour. In our context, well-off individuals with a reference group of similar characteristics might for instance experience cognitive dissonance when perceiving the crisis. However, the desire to comply with their identity and protect group membership could motivate them to stick to their initial beliefs, denying evidence in the opposite direction.

systematically more egalitarian attitudes in their experimental setting.

Manipulation and indoctrination by others. It may be beneficial for some individuals when other individuals maintain certain beliefs about the role of effort. This makes them work harder, for instance. Hence, there are clear incentives to try to manipulate beliefs and the process of belief formation. Theories of manipulation of beliefs about the role of effort are often rooted in a Marxist tradition according to which workers hold a *false consciousness* about the role of effort and the fairness of market rewards, that is sustained by indoctrination of the capitalist elite through education, political propaganda, the mass media, etc. Making use of the school system, capitalist elites may sustain, for instance, a “myth of meritocracy” that everybody has an equal chance to succeed and that outcomes depend on effort and ability.

Alesina et al. (2001) and Alesina and Glaeser (2004) offer a more recent version of this perspective when studying the question why the United States has a more limited welfare state than European countries. They observe that beliefs are remarkably more effort-oriented in the United States compared to European countries and argue that these differences are the result of different political institutions. According to their theory, beliefs are shaped by political entrepreneurs, on both sides of the Atlantic. Whereas American effort-oriented beliefs are formed by the wealthier class (through education, for instance), European luck-oriented beliefs are formed more often by Marxist-influenced unions, teachers, and politicians.

Motivated beliefs. According to a third perspective, individuals hold certain beliefs because they attach value to them or because they fulfil an important affective or functional need for them.⁶ The agents benefit from actively shaping their own beliefs.

Lerner (1980) discusses the natural tendency of individuals to believe that the world is a fair place in which efforts are finally rewarded in a way that everyone ends up receiving what they deserve. In general, people benefit from this belief “in a just world” and from thinking that they have some degree of control over the course of their lives, in order to feel reassured and pursue their long-term goals. When individuals are faced with evidence opposing their belief that efforts are systematically rewarded, e.g., during an adverse macro-economic shock, they

⁶Bénabou and Tirole (2011) model moral behaviour starting from an idea of identity that mixes individuals’ concerns about “who they are” and their previous selection of values. Bénabou (2015) and Bénabou and Tirole (2016) explore the implications of motivated beliefs for economics through several distortions that happen individually or socially.

will experience cognitive dissonance between their beliefs and the new evidence, and may update their beliefs about the role of effort.

Bénabou and Tirole (2006) offer a sophisticated model in which this just-world belief is instrumental to overcome procrastination problems and to motivate oneself (or one's children) towards effort. In their model, effort-oriented beliefs tend to be self-fulfilling. If enough people believe that mainly effort influences economic positions, a low tax rate will be set which increases the return on effort and makes it easier to sustain just-world beliefs. Otherwise, taxes will be higher so that the return on effort decreases and just-world beliefs become harder to sustain. This feedback mechanism provides an alternative explanation for the existence of the American effort-oriented politico-economic equilibrium with laissez-faire public policy, and a European equilibrium where luck plays a more important role in more extensive welfare states.

Individuals may also adjust their beliefs about the role of effort to protect or enhance their own self esteem, as a consequence of the psychological mechanism that is called *self-serving bias* (Hastorf et al., 1970). According to this bias, individuals tend to attribute their success (such as a high economic position) to their own dispositions, whereas failure is attributed to external forces such as luck. Rytina et al. (1970), for instance, document how poor individuals emphasize luck as determinant of their economic position, while rich individuals attribute their economic success more to personal qualities such as effort and ambition, see also Miller (1992) for a discussion.

In short, we can conclude that individuals' beliefs about the role of effort in achieving one's economic position are a result of the combination of several mechanisms. Individuals go through a process of observation and learning in their own environment, at the level of their close circle and also wider reference groups, with a stronger impact up to their early adult years. Besides, other agents may attempt to manipulate their beliefs. And, finally, individuals themselves can actively try to shape their beliefs in one or another direction. A large macro-economic shock may affect or disturb these mechanisms.

3 Data and variables

We use the Survey on Public Opinion and Fiscal Policy that is carried out by the Spanish Centre of Sociological Research (CIS). While this annual survey has been carried out every summer since 1993, our main question of interest is

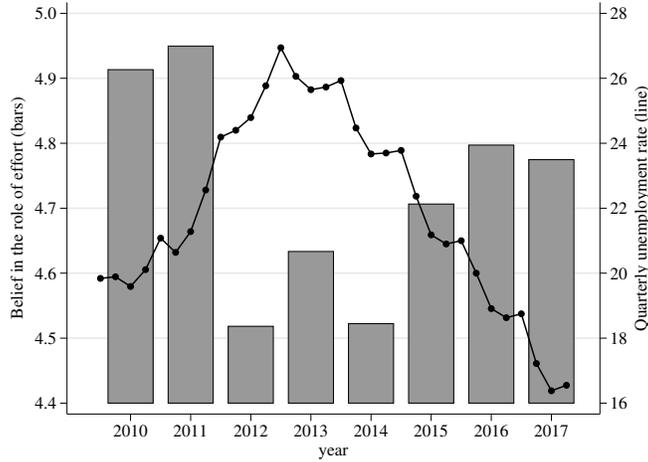


Figure 1: Beliefs about the role of effort (bars) and unemployment rates (line) in Spain.

available only since 2010, and therefore we focus on the period between 2010 and 2017. This period contains the peak and aftermath of the Spanish economic recession. We focus in this paper on the quarterly unemployment rate as a measure of the depth of the economic crisis.⁷ The black line in Figure 1 shows the evolution of this unemployment rate over the considered period in Spain. The unemployment rate starts at a high level of 19.84% in the first quarter of 2010, then it increases further to a staggering 26.94% in the first quarter of 2013 after which it gradually decreases to reach a level of 16.55% in the last quarter of 2017.⁸

The survey consists of nationally representative repeated cross sections of about 2,500 individuals per year. Pooling the eight waves between 2010 and 2017 together, we obtain a data set of about 20,000 individuals. For each of these respondents, we observe demographic characteristics, various socio-economic variables, and ideological indicators. In addition, we also observe the province of residence for each individual in the sample. This allows us to add the corresponding province-level unemployment rate for each individual.⁹ These unemployment

⁷Romaguera de la Cruz (2017) use an index of economic security as a measure of the severity of the recession in Spain.

⁸Data are obtained from INE, the National Statistics Institute of Spain.

⁹Backus and Esteller-Moré (2017) follow a similar procedure, adding municipality information to the CIS survey. We opted to add data for a more aggregate province level because this allows us to consider all provinces in the analysis (while going to a lower level would prevent

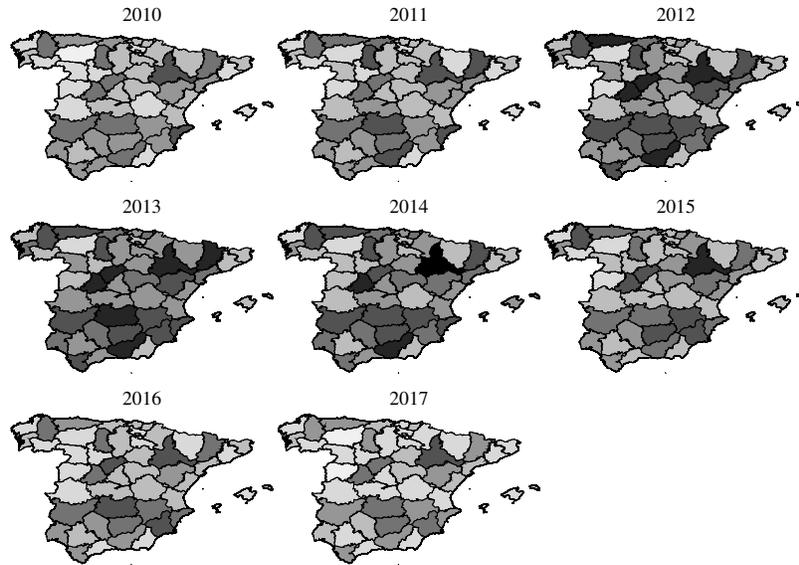


Figure 2: Evolution of the yearly unemployment rate per province, 2010-2017. Darker means higher unemployment, ranging from (0 - 5%) to (40 - 45%).

rates are publicly available and easily obtained from the National Statistics Institute of Spain (*Instituto Nacional de Estadística, INE*). The key figures are regularly released through the main media channels. Figure 2 presents maps of the unemployment rate in the 50 provinces for each year.¹⁰ Darker shaded areas have a higher unemployment rate. Across the provinces, there were substantial differences both in the level and evolution of the unemployment rate during the considered period. Figure 3 zooms in on the latter aspect and shows the maximal difference in quarterly unemployment rate over the considered period, per province. The differences range between 7.54% (Vizcaya) and 21.01% (Ceuta), with a median difference of 13.14%.

The data set contains several detailed questions dealing with opinions and beliefs about taxation, public services and political attitudes. We focus on a specific question that asks respondents to express their opinion on what factors drive economic position in society on a zero-to-ten scale. Higher scores reflect the belief that effort-related variables are more important and lower scores indicate

us from including all regions due to information unavailability and small sample sizes).

¹⁰Yearly unemployment rates are obtained by averaging the relevant four quarterly unemployment rates.

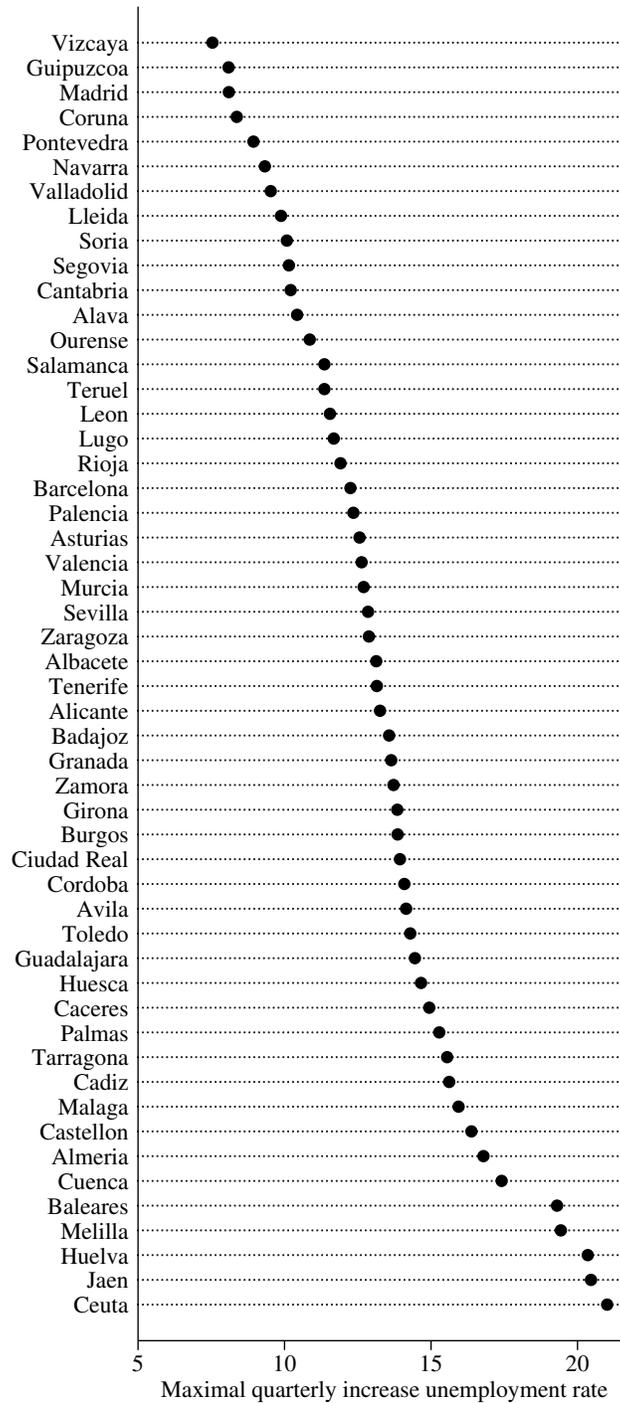


Figure 3: Maximal increase in quarterly unemployment rate between 2010 and 2017, by province.

a larger role for luck variables. The question is phrased as follows in the survey: “Some people think that economic position depends almost exclusively on effort, education and professional worth (on a 0-10 scale they would choose 0). Other people think that what really matters is family background, social network or simply luck (they would choose 10). What do you think influences more the economic position that people achieve in Spain?”¹¹

We refer to the responses to this question as the *beliefs about the role of effort on economic position* (BRE hereafter). The fact that precisely the same question was asked in each wave of the considered period makes it particularly interesting for this study. The bars in the background of Figure 1 show the average response to the BRE question in each wave. The average response hovers between 4.5 and 5, reaching lower levels when the unemployment rate peaks and vice versa. Figure 4 shows the distribution of the responses to the BRE question in 2010, the beginning of the considered period; in 2014, shortly after the peak of the crisis, and in 2017, the end of the considered period. We see that in 2014 more respondents have selected luck-oriented response categories (“0”, “1”, or “2”). Figure 5 shows that, except for the very effort-oriented response categories, the distribution of 2014 is first order stochastically dominated by the other waves, whereas 2010 and 2017 show a remarkably similar distribution. This means that at any response category, a larger proportion of the Spanish society gives an answer that is equal or lower in 2014 compared to 2010 or 2017.

The way in which the BRE question is formulated is arguably not ideal.¹² In particular, the examples that are listed to illustrate the notions of “effort” and “luck” to the respondents can be considered to be problematic when seen through the lens of the theory of equality of opportunity. While the notion of effort refers to a factor that is within the control of individuals, it is not clear that the other examples provided in the question, e.g., education and professional worth, are entirely within their control. Besides effort, other factors that are outside the control of an individual (such as innate talents, family background, and luck) determine educational achievements and professional worth. Contrarily, whereas luck and family background are clearly outside the control of an individual, the

¹¹Compared to the original survey, we have recoded this variable by reverting its scale, so that higher scores reflect more effort-oriented beliefs.

¹²A general concern with subjective questions about beliefs and attitudes deals with the possibility that different groups of respondents interpret the response scale in a systematically different way (King et al., 2004). Also at a theoretical level we find an ongoing debate about whether luck should be considered separately from effort and circumstances-related variables, taking as well into account the timing of its impact on outcomes (see Lefranc and Trannoy (2017)).

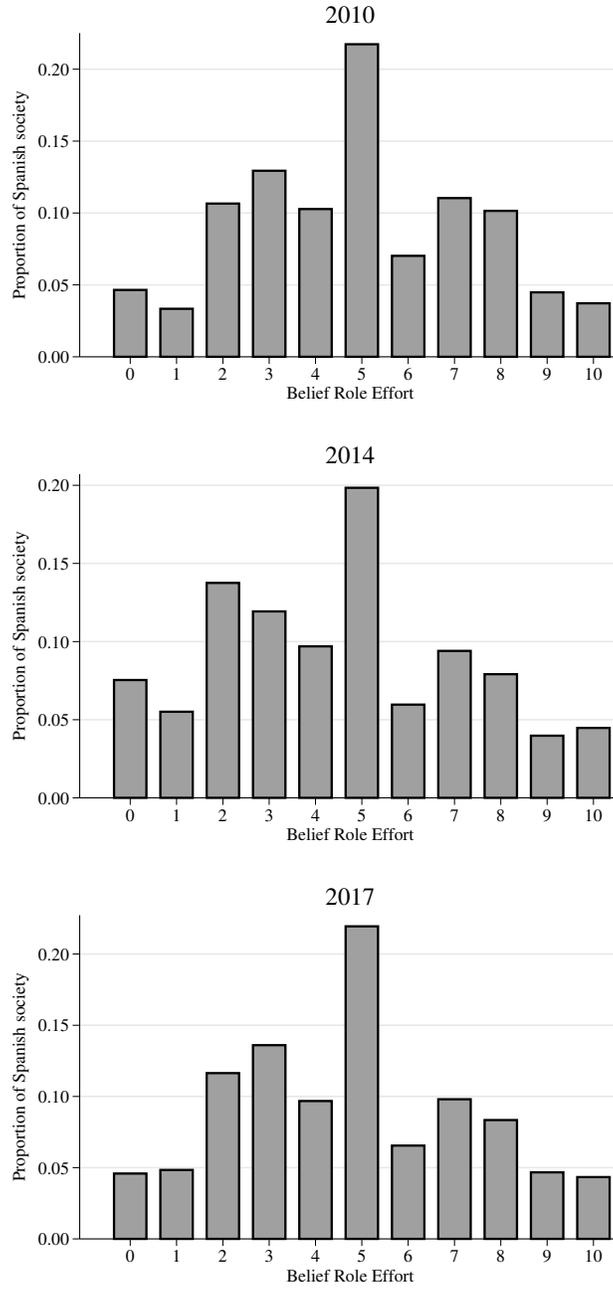


Figure 4: Beliefs about the role of effort in 2010 (top), 2014 (middle) and 2017 (bottom).

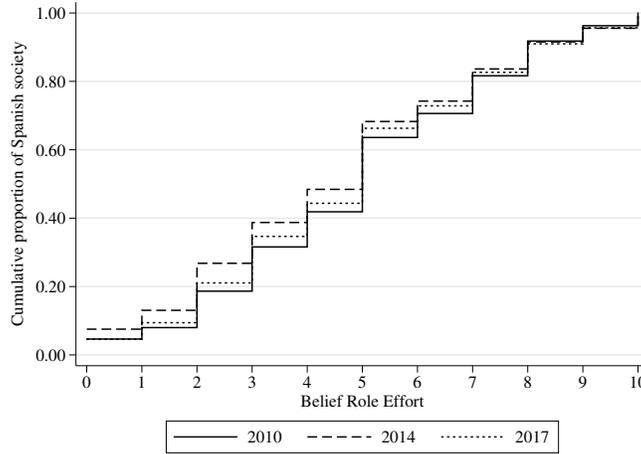


Figure 5: Cumulative distribution functions of beliefs about the role of effort in 2010, 2014 and 2017.

shape and composition of her social network may be to some degree within her control.

Moreover, this formulation of the BRE question differs from formulations in other studies, which may hamper comparability. Alesina et al. (2001); Giuliano and Spilimbergo (2013) use the version used in the World Values Survey (WVS) where respondents indicate agreement or disagreement with the following statements: “*In the long run, hard work usually brings a better life*” or “*Hard work doesn’t generally bring success - it is more a matter of luck and connections*”. Fong (2001); Alesina and La Ferrara (2005); Alesina and Giuliano (2011); Giuliano and Spilimbergo (2013) use the version of the General Social Survey (GSS) “*Some people say that people get ahead by their own hard work; others say that lucky breaks or help from other people are more important. Which do you think is most important?*”. The answers to this question can take a value from 1 to 3: hard work is most important (1), hard work and luck are equally important (2), luck is most important (3).¹³

Table 1 presents descriptive statistics of the variables used pooled across all

¹³Fong (2001) uses the Gallup Poll Social Audit of 1998, that includes questions about the level of opportunities in the US, causes of poverty and wealth (directly mentioning effort, circumstances and luck), and determinants of success, among which one can find several luck, circumstances and effort-related variables. Corneo and Grüner (2002) use a question about the importance of hard work for getting ahead in life from the International Social Survey Programme (ISSP) data of 2009.

waves, and we provide more details on the variable construction in the Appendix. We have coded the income variable as a categorical one and classified respondents as “very poor”, “poor”, “middle”, “rich”, and “very rich”. Also the level of education is displayed in five categories, ranging from “no formal education” to “higher education”. Even though the obtained data set is rather rich, several potentially interesting variables are missing, such as psychological traits capturing locus of control, and information on inequality aversion and preferences for redistribution.

Variable	Obs.	Mean	Std. Dev.	Min	Max
BRE [between 0 and 10]	19,241	4.73	2.61	0	10
Unemployment per province [in %]	19,771	22.09	6.55	8.7	40.79
Male [in %]	19,771	0.49	0.50	0	1
Married [in %]	19,771	0.53	0.50	0	1
Presence of children [in %]	19,675	0.29	0.45	0	1
Age [in years]	19,769	48.44	17.89	18	98
Migrant background [in %]	19,771	0.03	0.17	0	1
Unemployed [in %]	19,771	0.19	0.39	0	1
Level of income [five categories]	16,733	2.26	0.94	1	5
Level of education [five categories]	19,725	3.03	1.29	1	5
Ideology [between 0 and 10]	15,079	4.71	1.90	1	10
Left [in %]	19,771	0.35	0.47	0	1
Conservative [in %]	19,771	0.12	0.33	0	1
Socialist [in %]	19,771	0.14	0.35	0	1

Table 1: Descriptive statistics of the main variables (on the pooled sample).

4 Results

4.1 Adjustment of beliefs after the economic recession

In this section we present the baseline results capturing the effect of the province-level unemployment rate on the BRE question, discussed in the previous section. We proceed by gradually including additional sets of control variables. We start from a set of demographic characteristics as control variables, then we include some additional socio-economic variables and, finally, we add an ideology control variable.

Demographic variables. We start by estimating a first regression model that

takes the following form:

$$BRE_{ipt} = \alpha_p + \beta UNEM_{pt-1} + \gamma X_{ipt} + \varepsilon_{ipt}, \quad (1)$$

where the explained variable BRE_{ipt} indicates the answer provided by individual i in province p at time t to the BRE question about the main drivers of economic position. The benchmark model also includes a province-level fixed effect α_p and X_{ipt} , a vector with individual-level demographic characteristics (gender, marital status, presence of children, and an indicator of having a double nationality that we use as proxy for having a migration background).¹⁴ The idiosyncratic error term is denoted ε_{ipt} . The variable $UNEM_{pt-1}$ captures the unemployment rate of province p in the period $t - 1$, i.e., in the period just before the survey takes places. In our baseline specification we look at the unemployment rate averaged across the last four quarters, but we present alternatives to that choice in the sensitivity checks at the end of this section.

Ideally, we would like to identify the causal effect of the province-level unemployment rate on the beliefs about the role of effort. To interpret the coefficient β as the causal effect, the lagged province-level unemployment rate should be exogenous with respect to the observable individual demographic characteristics captured in X_{ipt} and the time-invariant unobservable province-level characteristics captured in the fixed effect α_p . The exogeneity assumption will be violated when individuals with specific beliefs have moved from one Spanish province to another as a consequence of the economic recession, for instance.¹⁵

The first column of Table 2 shows the estimation results.¹⁶ The coefficient of the lagged province-level unemployment rate is reported on the first row. An increase of the province-level unemployment rate by 1% shifts the responses on average by 0.026 points in the direction of luck. This coefficient is found to be significantly different from zero at any conventional significance level ($p <$

¹⁴According to the National Statistics Institute of Spain (with data updated to January 2018), the most frequent region of origin of Spanish residents with a double nationality is America (1,414,719), followed by Europe (378,599) and Africa (272,723).

¹⁵According to the National Statistics Institute of Spain, Madrid, Barcelona, and the Balearic Islands have shown a positive net internal migration during the considered period, whereas Sevilla, Cádiz or Toledo showed a negative net internal migration. However, as migration streams remain quite modest and stable over time, there seems to be no strong evidence suggesting a violation of the exogeneity assumption. Yet, results should be interpreted carefully.

¹⁶The reported results are obtained with ordinary least squares and (heteroskedasticity) robust standard errors. Results from ordered logit or ordered probit estimations are qualitatively similar (and available upon request).

0.001). At first sight, the size of the coefficient may seem rather small, negligible almost. Yet, as we have seen in Figure 3, the median increase of the province-level unemployment rate is about 10%, leading to shifts in the response in the direction of luck that are comparable in size with the effect of being married or having a migration status, provided the latter effects could be interpreted causally.

We find a remarkable age effect in the results of the first column of Table 2. Older respondents tend to give more effort-oriented responses compared to the respondents between 18 and 25, who form the reference category in the regression. It is unclear, without panel data, whether this finding reflects an age, a cohort or a time effect. A cohort effect, however, seems *a priori* plausible. The elderly in our sample were born, roughly, between 1920 and 1950. This implies that their childhood took place during and after the Spanish Civil War (between 1936 and 1939) under severe scarcity conditions, while their youth and *impressionable years* took place between 1940 and 1970, during the dictatorship.¹⁷ We believe that growing up in a dictatorial regime, with strong discipline and conservative values being imposed, together with severe repression against the defeated, could have left the print that hard-work and effort are key factors for success.¹⁸

At this point, it is useful to stress the important role played by the province-level fixed effects in specification (1). These fixed effects control for all time-invariant province-level factors, such as the average unemployment rate of a province across the eight considered waves. When estimating specification (1) without these province-level fixed effects, the effect of the lagged province-level unemployment rate shrinks to a level of -0.0054 ($p < 0.062$), see Table 8. Clearly, it is the change of the province-level unemployment rate, rather than the level of the unemployment rate, that is associated with the beliefs. One may wonder about the introduction of time fixed effects as well. As one can expect from looking at Figure 3, introducing an additional time fixed effect in specification (1) renders the coefficient of the province-level unemployment rate insignificant. Although there is considerable variation in the initial unemployment level, there is a high correlation between the evolution of the unemployment rate in all

¹⁷During and after the Spanish Civil War, the country faced severe hardship that was further augmented by the autarchy and international isolation policies imposed in the dictatorship. Social unrest and repression were maintained during the post-war period until the dictator's death in 1975 and end of the regime in 1978.

¹⁸Alesina and Fuchs-Schündeln (2007) have documented how the communist political regime affected belief formation in Eastern Germany.

	(1)	(2)	(3)
	BRE	BRE	BRE
Unemployment t-1	-0.026*** (0.006)	-0.020*** (0.006)	-0.021*** (0.007)
Male	0.042 (0.037)	-0.002 (0.037)	0.025 (0.042)
Married	0.249*** (0.043)	0.199*** (0.043)	0.188*** (0.049)
Presence of children	0.054 (0.050)	0.059 (0.050)	0.041 (0.056)
Age 26-35	-0.133* (0.074)	-0.175** (0.075)	-0.140 (0.086)
Age 36-50	0.036 (0.075)	-0.002 (0.076)	0.039 (0.088)
Age 51-65	0.211*** (0.075)	0.232*** (0.076)	0.275*** (0.087)
Age 66+	0.565*** (0.075)	0.706*** (0.082)	0.707*** (0.095)
Migrant	0.377*** (0.119)	0.443*** (0.119)	0.362*** (0.138)
Unemployed		-0.448*** (0.052)	-0.408*** (0.060)
Low income		-0.048 (0.049)	-0.081 (0.056)
Medium income		0.158*** (0.049)	0.083 (0.055)
High income		0.589*** (0.082)	0.496*** (0.088)
Very high income		1.290*** (0.429)	1.023** (0.450)
Low educ.		0.421*** (0.087)	0.421*** (0.106)
Medium educ.		0.682*** (0.101)	0.702*** (0.120)
High educ.		0.607*** (0.100)	0.609*** (0.119)
Very high educ.		0.853*** (0.098)	0.832*** (0.117)
Ideology			0.081*** (0.012)
Observations	19148	19148	14755
R^2	0.0387	0.0576	0.0600

Robust standard errors between brackets. Regressions include regional fixed effects

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Baseline regression.

provinces, so that little variation remains in the province-level unemployment rate after the introduction of both province-level and time fixed-effects.

Socio-economic variables. In a next step, we include a series of individual-level socio-economic characteristics Y_{ipt} that capture the own economic position of the respondent. These variables include the highest educational level obtained, an indicator of income categories, and an indicator of being unemployed. The second model looks as follows:

$$BRE_{ipt} = \alpha_p + \beta UNEM_{pt-1} + \gamma X_{ipt} + \delta Y_{ipt} + \varepsilon_{ipt}. \quad (2)$$

The second column of Table 2 presents the results. The coefficient of interest shrinks a little, but remains in the same order of magnitude. In addition, we can notice a strong positive association between the own economic position of the respondent and the belief that effort determines one's economic position.

Clearly, the aforementioned problem of endogeneity between explained and explanatory variable applies *a fortiori* to the interpretation of the coefficient of the socio-economic variables in Y_{ipt} . This positive association may indicate a self-serving bias, where individuals with better economic positions are motivated to believe that these positions were reached by their own effort, while individuals with a lower economic positions attribute these positions to factors outside their control, such as bad luck. Yet, they may also indicate that individuals with a stronger belief that effort determines their economic position, exert more effort and therefore achieve a better economic position. Without some exogenous variation in the economic position of the respondents it will be hard to disentangle both effects.

Ideological variables. Finally, we can go one step further and include an ideological variable that captures where respondents would place themselves on a left-right scale. One could argue that this variable is almost tautologically connected to the belief about the role of effort, with people ideologically more to the right attributing a larger role to effort as determinant of economic position. We denote the ideological variables Z_{ipt} , so that the third model looks as follows.

$$BRE_{ipt} = \alpha_p + \beta UNEM_{pt-1} + \gamma X_{ipt} + \delta Y_{ipt} + \zeta Z_{ipt} + \varepsilon_{ipt}. \quad (3)$$

The results are the third column of Table 2. Not surprisingly, we find indeed that respondents who consider themselves more right-wing, assign a larger role

to effort and vice versa. Reassuringly, however, we see that the size of the coefficient of interest on the top row is not affected much by the inclusion of the right-wing self identification variable.

Because some respondents preferred not to reveal their ideological position in the survey, the sample size shrinks considerably between the second and third column of Table 2.¹⁹ Due to the reduction of the sample size and potential endogeneity issues, we consider model (2) as our preferred specification.

4.2 Heterogeneity of adjustment of beliefs

The results in the previous section may mask some interesting systematic differences in how individuals form and update their beliefs. In this section, we explore some of these differences by sequentially interacting the coefficient of interest with some demographic, socio-economic, and ideological variables. This will allow us to cast some light on the role of the different mechanisms that drive the formation of beliefs, which we have discussed in Section 2.

Demographic variables. We start by our preferred specification (model 2) that includes demographic and socio-economic variables besides the province-level fixed effects and the lagged unemployment rate. We focus on the interaction between the coefficient of interest and three binary indicators: gender, being young (i.e. younger than 25) and being old (i.e., older than 66). Table 3 presents the results. We see in the first column that there are no gender differences in how the (lagged) province-level unemployment rate affects the beliefs about the role of effort.

In the second column we have included an interaction with a binary indicator that takes the value 1 if the respondent is in early adulthood, between 18 and 25 years old. These are the so-called *impressionable years* as described by Giuliano and Spilimbergo (2013). According to the *impressionable years* hypothesis, one may expect to see a larger adjustment of their beliefs due to the economic crisis. Yet, as shown in the second column of Table 3 we fail to find a statistically significant difference between this group and other age groups in our data set. A similar result is found in column three, that focusses on respondents above the age of 66. Older respondents turn out to be more effort-oriented, but we

¹⁹A sensitivity check in Table 9 in Appendix runs the baseline models on the restricted sample of respondents whose ideological position is known. This shows that the attrition due to the missing ideology variable does not have a substantial effect on the coefficient of interest.

	(1)	(2)	(3)	(4)
	BRE	BRE	BRE	BRE
Unemployment t-1	-0.020*** (0.007)	-0.019*** (0.006)	-0.019*** (0.006)	-0.018** (0.007)
Unemp × male	0.000 (0.006)			0.000 (0.006)
Unemp × young		-0.008 (0.009)		-0.009 (0.009)
Unemp × old			-0.004 (0.007)	-0.005 (0.007)
Observations	19148	19148	19148	19148
R^2	0.0576	0.0577	0.0576	0.0577

Robust standard errors between brackets. Regressions include regional fixed effects and controls for gender, marital status, presence of children, age, migrant background, income, education, and being unemployed.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Heterogeneity: role of demographic variables.

find no evidence that they update their beliefs differently after the shock of the economic crisis.

Socio-economic variables. We now turn to the heterogeneity of the effect with respect to the respondents own socio-economic position. Again, we proceed by including interactions between binary indicators based on the socio-economic variables and the coefficient of interest.

The results are presented in Table 4. In the first column, we see that respondents who are unemployed do not adjust their beliefs in a statistically different way compared to respondents who are not unemployed.

We do find significant differences in columns two and three, however. Here we see that lower educated and poor individuals have become more luck-oriented when their province-level unemployment rate has increased compared to other groups. In both cases the binary indicator is defined based on the lowest two categories of the five-point scale. This interesting finding may offer some supporting evidence for the idea that the existence of reference groups based on socio-economic position is important in the process of belief formation (Schokkaert and Truyts, 2017). When reference groups are assortative, individuals with a low economic position are more likely to meet individuals with a low economic position in their reference group. This makes the increasing unemployment rates more salient for individuals with a lower economic position and, therefore, may lead to a larger

	(1)	(2)	(3)	(4)
	BRE	BRE	BRE	BRE
Unemployment t-1	-0.019*** (0.006)	-0.015** (0.007)	-0.015** (0.006)	-0.011* (0.007)
Unemp × unemployed	-0.003 (0.007)			0.002 (0.007)
Unemp × low educ.		-0.010* (0.005)		-0.008 (0.005)
Unemp × poor			-0.011*** (0.003)	-0.011*** (0.003)
Observations	19148	19148	19148	19148
R^2	0.0576	0.0578	0.0585	0.0586

Robust standard errors between brackets. Regressions include regional fixed effects and controls for gender, marital status, presence of children, age, migrant background, income, education, and being unemployed.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Heterogeneity: role of socio-economic variables.

adjustment of the beliefs in the direction of luck.

Ideological variables. Table 5 starts from equation 3, but includes interactions between the coefficient of interest and binary indicators based on the left-right scale and with a question dealing with the political spectrum (with options such as “conservative”, “socialist” or “liberal”, among others). Firstly, we find evidence that more left-wing people turn more luck-oriented after an adverse economic shock compared to people who are more right-wing.²⁰

Interestingly, we also find some differences between people who position themselves as “socialist” (14.48% of the respondents over the eight waves) or “conservative” (12.30%). The former are found to become more luck oriented after an increase of the province-level unemployment rate, whereas the latter are found to become less luck oriented after the same increase (also for the conservative respondents the effect remains significantly negative ($p < 0.012$)).²¹ Again, we cannot do much more than speculate, but this finding seems consistent with a framework in which the process of beliefs formation is shaped by one’s ideological disposition, presumably to avoid cognitive dissonance.

²⁰When we control for ideology in the regression, the interaction between the unemployment variable and the dummy for being left-wing become insignificant.

²¹The positive interaction for the respondents who self-identify as conservatives can also be found when looking at a variable capturing reported voting behaviour in the last election. Yet, this is not the case for the result for the socialist respondents.

	(1)	(2)	(3)	(4)
	BRE	BRE	BRE	BRE
Unemployment t-1	-0.018*** (0.006)	-0.019*** (0.006)	-0.021*** (0.006)	-0.020*** (0.006)
Unemp × left	-0.005*** (0.002)			-0.003 (0.002)
Unemp × socialist		-0.004* (0.002)		-0.001 (0.002)
Unemp × conservative			0.012*** (0.003)	0.011*** (0.003)
Observations	19148	19148	19148	19148
R^2	0.058	0.058	0.059	0.059

Robust standard errors between brackets. Regressions include regional fixed effects and controls for gender, marital status, presence of children, age, migrant background, income, education, and being unemployed.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Heterogeneity: role of ideological variables.

4.3 Sensitivity checks

Timing. Finally, we return to our preferred model of equation (2) to explore the timing of the effect of the province-level unemployment data on the beliefs. The survey data are collected by the institution in charge of the survey (CIS) each year in the summer and the unemployment rates are compiled on a quarterly basis by the National Statistics Institute (INE). In our baseline specification of the previous section we have averaged the unemployment rates across the last four quarters to allow for some hysteresis in the assimilation of the unemployment statistics. Figure 6 shows the coefficient of each of the lagged province-level unemployment rates, up to eight lags. To be precise, we estimate the following model

$$BRE_{ipt} = \alpha_p + \beta_\tau UNEM_{pt-\tau} + \gamma X_{ipt} + \delta Y_{ipt} + \varepsilon_{ipt}, \quad (4)$$

for $\tau = 0, 1, \dots, 8$ with Figure 6 reporting the β_τ coefficients.

Regional scope. While we have used province-level unemployment rates in our analysis to catch the possibly diverging impact of the economic crisis across regions, we display below two sensitivity checks that show our baseline specification including community-level and national unemployment rates. In the former, the size and sign of the coefficients are very close to those of the re-

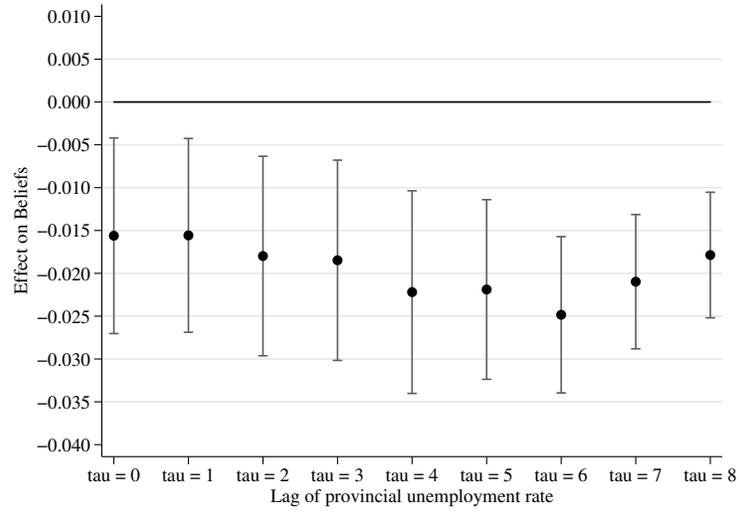


Figure 6: Effect of the province-level unemployment rate on BRE, for different values of τ .

gression including province-level unemployment rates, and in the latter the size increases slightly. Also the demographic, socio-economic, and ideological variables show similar coefficients.

	(1)	(2)	(3)
	BRE	BRE	BRE
Unemployment t-1	-0.031*** (0.007)	-0.024*** (0.007)	-0.022*** (0.008)
Male	0.045 (0.037)	0.001 (0.038)	0.029 (0.042)
Married	0.244*** (0.043)	0.194*** (0.043)	0.183*** (0.049)
Presence of children	0.080 (0.051)	0.084* (0.050)	0.061 (0.057)
Age 26-35	-0.149** (0.075)	-0.192** (0.075)	-0.151* (0.086)
Age 36-50	0.019 (0.076)	-0.019 (0.076)	0.027 (0.088)
Age 51-65	0.201*** (0.075)	0.217*** (0.076)	0.256*** (0.087)
Age 66+	0.552*** (0.076)	0.684*** (0.082)	0.681*** (0.095)
Migrant	0.376*** (0.119)	0.442*** (0.119)	0.342** (0.138)
Unemployed		-0.451*** (0.052)	-0.411*** (0.060)
Low income		-0.047 (0.049)	-0.085 (0.056)
Medium income		0.168*** (0.049)	0.086 (0.055)
High income		0.586*** (0.082)	0.492*** (0.088)
Very high income		1.274*** (0.439)	1.001** (0.461)
Low educ.		0.418*** (0.088)	0.419*** (0.107)
Medium educ.		0.666*** (0.102)	0.689*** (0.122)
High educ.		0.589*** (0.101)	0.589*** (0.120)
Very high educ.		0.839*** (0.099)	0.817*** (0.118)
Ideology			0.082*** (0.012)
Observations	19148	19148	14755
R^2	0.0251	0.0440	0.0457

Robust standard errors between brackets. Regressions include regional fixed effects

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Baseline specification with unemployment per community.

	(1)	(2)	(3)
	BRE	BRE	BRE
Unemployment t-1	-0.045*** (0.007)	-0.038*** (0.007)	-0.036*** (0.008)
Male	0.047 (0.038)	0.007 (0.038)	0.034 (0.043)
Married	0.247*** (0.043)	0.202*** (0.043)	0.195*** (0.049)
Presence of children	0.089* (0.051)	0.099** (0.050)	0.082 (0.057)
Age 26-35	-0.153** (0.075)	-0.195** (0.076)	-0.164* (0.087)
Age 36-50	0.009 (0.076)	-0.038 (0.076)	-0.006 (0.088)
Age 51-65	0.206*** (0.075)	0.203*** (0.076)	0.230*** (0.088)
Age 66+	0.570*** (0.076)	0.669*** (0.082)	0.662*** (0.095)
Migrant	0.368*** (0.119)	0.404*** (0.119)	0.314** (0.138)
Unemployed		-0.461*** (0.052)	-0.427*** (0.060)
Low income		-0.066 (0.049)	-0.103* (0.056)
Medium income		0.130*** (0.049)	0.048 (0.055)
High income		0.542*** (0.082)	0.455*** (0.088)
Very high income		1.164*** (0.426)	0.857* (0.443)
Low educ.		0.405*** (0.087)	0.398*** (0.106)
Medium educ.		0.599*** (0.101)	0.617*** (0.120)
High educ.		0.570*** (0.099)	0.564*** (0.118)
Very high educ.		0.767*** (0.098)	0.738*** (0.116)
Ideology			0.070*** (0.012)
Observations	19148	19148	14755
R^2	0.0149	0.0322	0.0329

Robust standard errors between brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Baseline specification with national unemployment rates.

5 Conclusion

We have explored the effect of the large unemployment shock caused by the Spanish economic recession on beliefs about the role of effort. We have found some evidence that Spanish individuals have become slightly more luck-oriented in provinces where the unemployment rate increased more during the economic crisis. A 10% increase in the province-level unemployment level is associated with a average shift of about 0.26 points in the direction of luck on a 10-point scale, according to our estimates. The order of magnitude of this shift is comparable to the effect of becoming unemployed oneself. Moreover, we have seen that poorer, lower educated individuals, and those who position themselves as more left-wing and “socialist” tend to shift their beliefs more in the direction of luck after an adverse unemployment shock, whereas individuals who identify as “conservative” tend to shift their beliefs less.

It is an open question whether our findings generalize to other countries and other macro-economic shocks. Moreover, there seem to be interesting avenues for further research that could be explored with better data. Panel data including information about beliefs, for instance, would allow to follow precisely how individual beliefs change over time. Experimental laboratory data, on the other hand, would allow to study causes and consequences of beliefs about the role effort in a controlled way, see Frank et al. (2015) for a recent example.

Since the beliefs about the role of effort have been found to be an important determinant of the demand for redistribution, we can speculate that the observed (modest) shift in beliefs may have caused an increase in the demand for redistribution. As it turns, the Spanish political scenario suffered a deep transformation from 2014, with the birth of the left-wing party Podemos. By the end of 2015 this party (and the center-right formation Ciudadanos) entered the Spanish congress with significant representations. This stands as a turning point in the recent political history of the country and breaks the bipartisan system that was at play since the early eighties. These facts seem consistent with our findings that the beliefs about the role of effort are affected by the economic recession, in particular for poorer, lower educated individuals and those who identify as more left-wing and “socialist”. It remains unclear, however, whether the shift in beliefs will have some long-lasting effects on the Spanish society or not.

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Appendix

Additional tables and figures

	(1)	(2)	(3)
	BRE	BRE	BRE
Unemployment t-1	-0.006** (0.003)	0.005 (0.003)	0.006* (0.003)
Male	0.047 (0.038)	0.004 (0.038)	0.030 (0.043)
Married	0.251*** (0.043)	0.200*** (0.043)	0.193*** (0.049)
Presence of children	0.086* (0.051)	0.091* (0.050)	0.072 (0.057)
Age 26-35	-0.158** (0.075)	-0.197*** (0.076)	-0.166* (0.087)
Age 36-50	0.003 (0.076)	-0.036 (0.076)	-0.003 (0.088)
Age 51-65	0.197*** (0.075)	0.205*** (0.077)	0.232*** (0.088)
Age 66+	0.560*** (0.076)	0.675*** (0.082)	0.670*** (0.095)
Migrant	0.358*** (0.119)	0.422*** (0.119)	0.333** (0.138)
Unemployed		-0.477*** (0.052)	-0.445*** (0.060)
Low income		-0.066 (0.049)	-0.105* (0.056)
Medium income		0.151*** (0.049)	0.069 (0.055)
High income		0.565*** (0.083)	0.477*** (0.089)
Very high income		1.163*** (0.427)	0.854* (0.444)
Low educ.		0.425*** (0.088)	0.427*** (0.107)
Medium educ.		0.622*** (0.102)	0.645*** (0.121)
High educ.		0.591*** (0.100)	0.595*** (0.120)
Very high educ.		0.786*** (0.099)	0.766*** (0.117)
Ideology			0.070*** (0.012)
Observations	19148	19148	14755
R^2	0.0130	0.0309	0.0317

Robust standard errors between brackets. 31

Regressions do not include regional fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Baseline regression (no regional fixed effects).

	(1)	(2)	(3)	(4)
	BRE	BRE	BRE	BRE
Unemployment t-1	-0.026*** (0.006)	-0.027*** (0.007)	-0.020*** (0.006)	-0.021*** (0.007)
Male	0.042 (0.037)	0.059 (0.042)	-0.002 (0.037)	0.024 (0.042)
Married	0.249*** (0.043)	0.248*** (0.049)	0.199*** (0.043)	0.202*** (0.049)
Presence of children	0.054 (0.050)	0.047 (0.057)	0.059 (0.050)	0.044 (0.056)
Age 26-35	-0.133* (0.074)	-0.131 (0.085)	-0.175** (0.075)	-0.135 (0.086)
Age 36-50	0.036 (0.075)	0.047 (0.086)	-0.002 (0.076)	0.041 (0.088)
Age 51-65	0.211*** (0.075)	0.227*** (0.085)	0.232*** (0.076)	0.276*** (0.087)
Age 66+	0.565*** (0.075)	0.595*** (0.087)	0.706*** (0.082)	0.765*** (0.094)
Migrant	0.377*** (0.119)	0.313** (0.138)	0.443*** (0.119)	0.384*** (0.138)
Unemployed			-0.448*** (0.052)	-0.422*** (0.060)
Low income			-0.048 (0.049)	-0.098* (0.056)
Medium income			0.158*** (0.049)	0.079 (0.055)
High income			0.589*** (0.082)	0.512*** (0.088)
Very high income			1.290*** (0.429)	1.059** (0.459)
Low educ.			0.421*** (0.087)	0.450*** (0.106)
Medium educ.			0.682*** (0.101)	0.730*** (0.121)
High educ.			0.607*** (0.100)	0.628*** (0.119)
Very high educ.			0.853*** (0.098)	0.843*** (0.117)
Observations	19148	14755	19148	14755
R^2	0.0387	0.0399	0.0576	0.0567

Robust standard errors between brackets. Regressions include regional fixed effects

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Baseline specification without the missing values of the ideology variable.

Description of the main explanatory variables

Unemployment rate. Continuous variable, obtained by assigning to each respondent the unemployment rate of the province of residence. We obtain this information from the National Statistics Institute of Spain, that releases quarterly updates on this and other macroeconomic indicators. In our main specification we look at the unemployment rate averaged across the last four quarters, but some alternatives are studied as sensitivity checks.

Male. Dummy variable, taking value 1 for males.

Marital status. Dummy variable, taking value 1 for married individuals.

Presence of children. Dummy variable, taking value 1 for individuals with one or more young children (in school years).

Age. Categorical variable, constructed by grouping the age at the moment of the survey into five categories corresponding to the age brackets 18-25, 26-35, 36-50, 51-65, and older than 66 years-old.

Migrant background. To proxy migration status we construct a dummy variable, taking value 1 for respondents who have the Spanish and at least one other nationality.

Unemployed. Dummy variable, taking value 1 when the individual declares to be unemployed at the time of the interview. It is based on the variable “working condition”, reflecting whether the respondent belongs to “managers and professionals”, “medium managers”, “small entrepreneurs”, “farmers”, “office and services workers”, “skilled workers”, “unskilled workers”, “retired and pensioners”, “unemployed”, “students”, “non-paid housework”, or “non-classifiable”.

Income. Categorical variable. In the waves prior to 2013, income was measured using a response scale with seven verbal categories, ranging from “very low” to “very high”. After 2013, the income question uses a response scale with ten numerical intervals, ranging from “income lower than 300 euros” to “income higher than 6000 euros”. We harmonized both response scales into the following five categories: “lower than 300”, “301-900”, “901-1800”, “1801-4500”, and “higher than 4501” with corresponding verbal categories ranging from “very low” to “very high”. Our experimentation with the data has shown this harmonization to lead to income distributions with reasonably similar shapes across the waves. This harmonization procedure should be treated with caution, however.

Education. Categorical variable, capturing the different stages in the Spanish educational system. These have been grouped into five categories: “no formal

education”, “primary education”, “secondary education”, “professional training”, and “higher education”.

Ideology. Categorical variable based on a question asking the respondent to position herself on a 0-10 scale in which 0 means “left” and 10, “right”.

Left. Dummy variable, taking value 1 when the respondent chooses a response between 0 and 5 in the ideology scale.

Conservative. Dummy variable, taking value 1 when the respondent positions herself as a “conservative” in the political spectrum, choosing this option when offered several alternatives such as “socialist”, “conservative”, or “liberal”.

Socialist. Dummy variable, taking value 1 when the respondent positions herself as “socialist” in the political spectrum, choosing this option when offered several alternatives such as “socialist”, “conservative”, or “liberal”.

Regional indicators. Spain is divided into 17 autonomous communities and 2 autonomous cities (Ceuta and Melilla, geographically situated in the North coast of Africa, surrounded by Moroccan territory). Each community consists of one or several provinces, amounting to a total of 50 provinces.