FERTILITY INTENTIONS AND THE GREAT RECESSION IN EUROPE: THE ROLE OF REPRODUCTIVE UNCERTAINTY

Abstract

Using several rounds of the Eurobarometer [EB] survey, we examine the relationship between lifetime fertility intentions and the "Great Recession" in Europe. We suppose that the increase in unemployment rates observed between 2006 and 2011, the years in which the two EB surveys were conducted, are key driving forces behind the decline of fertility intentions observed in some EU countries, like Greece, over the 5-year period. Our findings reveal that the increasing uncertainty attached to the reported fertility intentions substantially contributes to the declining pattern observed over the five years and that people who negatively assess the country economic situation are more likely to plan smaller family than those who have a more optimistic view of the country past short-term economic trend. Eventually, the aggregate negative changes occurred in fertility intentions between 2006 and 2011 are positively correlated with the increase of youth unemployment rates. We might expect a similar declining trend in lifetime fertility intentions also in other countries – such as Spain, Italy, Ireland and Portugal – in the years to come if the economic crisis starts to be perceived as heavily as in Greece in such countries.

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1. Introduction

When asked to estimate their final complete family size, individuals tend to under-estimate the number of children they will have in their whole reproductive career; nevertheless, their reported lifetime fertility intentions are a strong predictor of their actual fertility (Schoen et al. 1999; Quesnel-Vallée and Morgan 2003; Bongaarts 2001). One of the most important values of reproductive intentions lies in the fact that they are informative about directional trends: actual and intended fertility show similar trends despite the fact that are not at even levels (Goldstein, Lutz and Testa 2003; Hin et al. 2011, p.132).

In this context, therefore, it is surprising that while the economic recession has been studied in relation to actual fertility (see, among others, Sobotka et al. 2011) no analyses of the relationship between economic recession and fertility ideals and intentions have yet been carried out. If the recent economic crisis has played a role in re-shaping attitudes towards childbearing either through views of individual life courses to come or through a general attitudinal shift in the place of family within society, this could play a role in affecting the anticipated recovery in TFR after the end of the recession in some countries. This could suggest the possibility of an impact upon cohort/quantum fertility.

We aim to extend upon previous literature by focusing on the link between fertility intentions and the 'Great Recession' since 2008. More specifically, we try to answer the following questions: Has the recent economic recession affected fertility intentions and, if so, how? Are the changes concentrated either spatially or in some age and socio-economic groups? What future trajectories might we anticipate?

It is important – if difficult – to differentiate on-going trends in pTFR from those occurring as a result of the recession. We therefore analyse three waves of the Eurobarometer [EB] survey – 2001, 2006 and 2011 – in order to identify any distinct shifts occurring between 2006 and 2011 as compared to between 2001 and 2006. This latter period includes the onset of the Great Recession in 2008. However, our findings will be necessary limited by only having three data points and, crucially, by the fact that the recession is shifting in form and intensity in different European settings over time (see Section 2.2). Indeed, the recession is arguably at its most intense in countries such as Greece and Spain in 2012, i.e. after the last wave of the survey (Bentolila et al., 2012). In Spain, for example, the national public debt is expected to rise from 85% in 2012 to 90.5% in 2013 (Washington Post, 2012).

2. Background

2.1 Recent trends in pTFR in Europe

During the 1990s, period total fertility rates [pTFR] across Europe generally fell to very low levels (Kohler, Billari and Ortega 2002). As Figure 1 demonstrates, in most countries the 2000s generally saw an upturn in pTFR, largely as a result of the tempo effect of postponement of births to later ages (Sobotka 2004). In 2008, for example, pTFR was rising in every country in Europe (apart from a marginal decline in Luxembourg) (Eurostat 2011). However, in all but six EU countries, pTFR either declined in 2010 or stagnated. Latvia saw the most pronounced decline as the country grappled with extremely high unemployment and a massive contraction of the economy. In Hungary, Malta and Romania, a transition from stagnation to decline occurred while in Bulgaria, Cyprus and, to an extent, Slovakia, recent increases were sharply turned into declines. For most countries, meanwhile, recent increases in fertility turned to stagnation in 2010 (with the exceptions of Denmark and Spain). Luxembourg, Sweden, Germany, Slovenia, Portugal and Austria each saw modest increases in fertility during 2010. Clearly, then the relationship between the 'Great Recession' and pTFR in Europe is not straightforward and unidirectional.

FIGURE 1 HERE

2.2 'The Great Recession' in Europe

The 'Great Recession' in Europe has taken a variety of shifting forms in both intensity and regional impact since its onset in 2008. From its roots in the sub-prime mortgage market through the collapse of international and national banks to the current Eurozone/sovereign debt crisis, the Great Recession has gone through a number of manifestations. If, for example, we consider unemployment we can see significant fluctuations across both time and space. Indeed, there is clear evidence of two distinct 'peaks' of worsening unemployment in late 2008 and from mid-2011. This is especially important in terms of interpreting the results of the Eurobarometer survey analysed here (Eurostat, 2011).

Unemployment has struck parts of Europe with different rates of intensity. In Figure 2, we separate out the recent unemployment patterns of the EU, Japan and the USA (2a); the larger economies most affected by the sovereign debt crisis, namely Portugal, Ireland, Italy, Greece and Spain – the so-called 'PIIGS' (2b); and other countries with unemployment rates in July 2012 of more than 10.0% (2c), 7.5-10.0% (2d), 6.0-7.5% (2e) and less than 6.0% (2f). Clearly, highly divergent patterns emerge. Of the 'PIIGS', Greece, Spain and Ireland have seen pronounced, constant increases in unemployment, with a sharp rise in Italy since 2011. The Baltic States (Latvia, Lithuania and Estonia) saw a sharp turnaround in 2008 as a result of a sharp about-turn in economic growth – but each of these appears to have brought unemployment back under control. Other new accession countries such as Bulgaria, Hungary, Cyprus and Slovenia have seen steady increases in unemployment up to around 10%, while the economic 'miracles' in Poland and Slovakia have been halted. However, other large, western and northern economies have posted relatively modest increases in unemployment. Germany, indeed, returned a constant

decline over the period of the crisis – although the underlying confidence of the German population regarding its obligations in the sovereign debt crisis should not be underestimated.

FIGURE 2 HERE

Turning to youth unemployment, the picture appears even starker. Among young people (aged below 25) in 2011, unemployment rates in Greece and Spain hover around 45% with a further six countries – Italy, Ireland, Portugal, Latvia, Lithuania and Slovakia – around 30%. This, of course, is difficult to judge in relation to impacts on fertility. If the Recession ends relatively soon, and economic prosperity returns to Europe – and Southern Europe in particular – then the young will have more time to recoup lost time regarding the postponement effect observed in other economic shocks. However, if the Recession is prolonged and a generation of young people are left in a fragile labour market, then Easterlin's observation regarding the importance of the relative prosperity of the youth cohorts could mean a general decline in quantum fertility (Easterlin 1976).

A final feature of this recession attempts by European governments to bring about fiscal consolidation. These have taken the form of quantitative easing, tax rises and austerity drives – with alternative emphases on each element in different settings. Austerity packages are potentially very important in the extent to which they impact upon a wide array of support mechanisms surrounding the family. These range from direct contributions through family policy initiatives and other welfare provisions through to the impact upon a declining number of jobs and opportunities in the public sector. These changes in government expenditure have been negative – and are projected to be deeper – in many settings across Europe, but especially in the so-called 'PIIGS' (Economist 2012).

2.3 Relationship between fertility and macroeconomic growth

There is a wide and extensive literature concerning the relationship between fertility and economic conditions in general and recession in particular. Here, therefore, we outline the state-of-the-art of current thought on the topic.

The economic argument concerning fertility and recession is, fundamentally, whether or not the relationship is pro- or counter-cyclical. The argument for a counter-cyclical relationship is based upon the assumption that temporary periods of unemployment constitute a good time for childbearing as the opportunity costs are lower. This, in turn, stems from Becker's microeconomic model of fertility (Becker, 1960, Becker, 1991). Here, childbearing is recognised as profoundly time consuming, and the associated opportunity costs are closely linked to the potential wages of the parents. Rising male wages produce an income effect that raises *demand* for children. For women, rising female wages results in a combined income and substitution effect. The income effect raises the demand for children, while the substitution effect results in an increased cost of children relative to other goods. In this context, women (especially those with high potential wages) may restrict fertility and 'trade-off' children for less time-demanding

alternatives. On the other hand, when the substitution effect is diminished for women – perhaps through higher rates of unemployment, fertility should – theoretically – increase.

The most widely quoted empirical evidence for a counter-cyclical relationship between fertility and recession is the increased birth rates of the United States in the 1960s and 1970s. Butz and Ward (1979a; 1979b), in particular, found evidence of this for the early 1970s. However, later research has suggested that fertility in this period did, in fact, remain largely pro-cyclical (Macunovich, 1995).

Indeed, a pro-cyclical relationship between recession and fertility is one which appears to prevail in the literature. Empirically, this has been found to be the case in both long time series (Sobotka et al., 2011, Rindfuss et al., 1988) and individual country data (Adsera, 2011, De Beer, 1991, Hoem, 2000, Kravdal, 2002, Macunovich, 1996, Namkee and Mira, 2001, Rindfuss et al., 1988). Sobotka et al. (2011) examined 701 country-year cases in order to ascertain the association between GDP change and changes in the period pTFR. Theoretically, as Easterlin observed, fertility varies with the relative affluence of the younger compared to 1.1 in times of growth (GDP growth of 1.0% or higher) and 1.2 in periods of stagnation (Easterlin, 1973, Easterlin, 1976).

Despite this, Sobotka et al. (2011) point out that in terms of household responses to economic conditions, fluctuations in GDP are not necessarily the best variables to employ. Various studies for both the USA (Becker, 1960) and the Netherlands (De Beer, 1991, de Jong, 1997, Fokkema et al., 2008, Van Giersbergen and De Beer, 1997), for example, have examined the relationship between consumer confidence and fertility, with each broadly finding that declines in birth rates were positively associated with trends in both purchases and indices of consumer confidence (with appropriate lags).

2.4 Relationship between fertility and unemployment and microeconomic conditions

Unemployment is generally identified in the literature as a far more tangible measurement of the impact of recession upon men and women of reproductive age than GDP growth rates. Indeed, the on-going low fertility rates found in Southern Europe have been partly attributed to persistently high levels of unemployment and job instability (Adsera, 2004, Adsera, 2005, Billari and Kohler, 2004). A negative relationship between unemployment and fertility has been found in a wide array of studies across Europe, North America and East Asia (see Sobotka et al., 2011 for a complete review), with many of these studies disaggregating by gender effects (Örsal and Goldstein, 2010) and by individual and aggregate trends in unemployment (Kravdal, 2002). Other studies have identified the importance of unemployment in determining *timing* of fertility – especially the transition to first birth (Meron and Widmer 2002).

It is important, however, to move beyond considering simple linear relationships, and to recognise the fact that the association between unemployment/fragile labour conditions and fertility is complex and heterogeneous across age, parity, institutional framework and length of economic shock. In Finland, for example, the economic shock of

the early 1990s was met with a continuing upward trend in births at parity two and above while first-order births were postponed (Vikat, 2002, Vikat, 2004) – a feature which suggests the possible role of strong welfare states in mitigating the impact of economic shocks upon fertility. A similar mixed relationship has recently been reported in Japan by Hashimoto and Kondo (2011) who found that in the period of recession fertility among college-educated women who entered the labour market at the onset of recession *rose*, while fertility among secondary educated women and among women who entered the labour market at the height of recession declined – or, likely, was postponed.

It is also important to note the changing social and economic *context* of the current Recession. This can help us to examine the extent to which the theoretical lessons from earlier economic shocks are useful. Such factors include the later overall age of childbearing which means that older women who postpone are left with a smaller time window to catch-up; the near 'universality' of the recession across the continent (unlike the Northern- and Eastern-European recessions of the early 1990s). This could have a reinforcing effect in prolonging the recession and austerity drives in certain countries through the interconnectedness of the international bond market. Finally, the institutional context is quite different – not least through the widespread adoption of austerity measures. Beyond this, significant changes in the family and household structures, patterns of partnership formation as well as ongoing labour market alterations and pension reforms mean a very different context in the 2010s to, say, the 1970s. Consider, for example, the rise of short-term, fragile employment and the wider context of the dualisation of the labour market (Davidsson and Nacyk, 2009). Furthermore, compared to earlier recessions, the female labour force participation ratio [FLFPR] is significantly higher than previous recessions, which could affect the inter-relationship between the labour market, recession and fertility.[1] In Italy, for example, the FLFPR in 1970 was just over 30% compared to 63% in 2010. Similarly in Greece the FLFPR rose from 59% in 1990 to 78% in 2010 (OECD, 2012). This could have a profound impact upon the theoretical appraisals outlined above.

2.5 Relationship between fertility intentions and socio-economic factors

To recapitulate, there is strong theoretical evidence that economic shocks – especially as mediated through unemployment – impact negatively upon pTFR. In the current 'Great Recession', there is also clear evidence of both declines in pTFR as well as stagnation, or what might be better termed in the correct temporal context as 'stalled increases'. We have already identified the seriousness of this 'Great Recession' in terms of both absolute and relative changes in unemployment, especially among the young. Furthermore, we have identified the somewhat new contexts in terms of both micro- and macro-institutional contexts – namely recent shifts in familial and household labour and modes of support as well as the ongoing austerity packages driven by the sovereign debt crisis.

However, to better understand the impact of economic uncertainty on fertility we look at the relationship between economic crisis and individuals' reproductive decision-

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[1] For a full series of OECD data, see [http://dx.doi.org/10.1787/lfs-data-en]

making which plays an important role in shaping fertility outcomes (Morgan, 2001). Individuals and societal attitudes and norms surrounding families and partnerships are an important mediator in the relationship between economic context and fertility outcomes. As Shoen et al. (1999) observe, 'fertility is purposive behavior that is based on intentions, integrated into the life course, and modified when unexpected developments occur' (p.799). As such we would expect economic shocks and unemployment – as unexpected developments – to create some modification.

However, there is currently relatively little research which explicitly links unemployment and economic shocks (as distinct from general income variation) to fertility ideals and intentions – not least because of the difficulty of isolating the role of unemployment from other socio-economic features, especially in economies and societies which are in the process of transition (Philipov, Spéder and Billari 2006, Bühler and Fratczak 2004, Kohler and Kohler 2002, Spéder and Vikat 2005). Furthermore, the collection of data which examined the extent to which economic shocks and unemployment affected previously stated fertility intentions would need to be longitudinal. Exceptions include Philipov (2002) who, using the Bulgarian Gender and Generations Survey, found that unemployed women were less likely to intend a second birth than the employed as well as identifying that a growth of income associated positively with fertility intentions.

We also need to explore in greater depth the manner by which these interactions between economic change, intentions and fertility outcomes are mediated. For example, the relationship between happiness – potentially an important micro-level reflection of macro-level trends mediated through individual personalities – and fertility has been explored in great depth (Margolis and Myrskylä, 2011). Indeed, these interactions lie at the heart of the micro-macro decision-making processes and, to use Easterlin's expression, the 'conflict between resources and aspirations' (Easterlin, 1976b).

Uncertainty and certainty is a further crucial factor. We know that uncertainty/certainty in fertility intentions plays an important role in defining and shaping fertility outcomes (e.g. Morgan 1981, Ní Bhrolcháin and Beaujouan 2012, Bernardi, Cavalli and Mynarska 2010), but again the relationship between economic shocks, unemployment and uncertainty in fertility intentions has been very little explored in the literature.

Sobotka et al suggest that 'we should interpret the aggregate effects of recession as outcomes of frequently countervailing forces where some individuals find it advantageous to have a child during economically uncertain times, whereas other will decide to postpone the next birth or refrain from childbearing altogether' (2011, p.271). Indeed, it is exceptionally difficult to disentangle the role of explicitly economic factors from other factors. While recognising this heterogeneity in experience, this point also leads us to the final important puzzle of whether recession has an overall impact upon tempo and/or quantum of fertility. The consensus view appears to be that recession generally impacts upon *timing*, especially of first-births. However, one recent study has identified a possible link between recession and a decline in quantum of fertility (Örsal and Goldstein, 2010) – although, again, the fact that economic recessions in the twentieth century have tended to

'sit' in the midst of fertility decline *anyway* which means an increased difficulty of disentangling the effect.

Using several rounds of the Eurobarometer [EB] survey, we examine the relationship between lifetime fertility intentions and the "Great Recession" in Europe. We suppose that the increase in unemployment rates observed between 2006 and 2011, the years in which the two surveys were conducted, are key driving forces behind the decline of fertility intentions observed in some EU countries, like Greece, over the 5-year period. To estimate the changes in the country economic performance due to the "Great Recession" and their impact on reproductive intentions we use also the individuals' subjective evaluation of their country socioeconomic situation over the past five years, i.e., 2006-2011.

Crucially, we examine both *intentions* and *stated certainty* in order to identify possible changes in either.

3 Data and methods

3.1 Selected sample

The empirical analysis is based on the Eurobarometer surveys carried out in 2006 and 2011[2] in the 27 EU countries. The stratified sampling procedure assures nearly equal probability samples of about 1,000 respondents aged 15 or above in each of the countries (with the exception of Luxembourg, Malta and Cyprus which had smaller sample size of just 500 individuals). The sample size allows us to make equally precise estimates for small and large countries, as well as to make comparisons between sub-groups broken down by sex, age, education, marital status, and so on. The survey used a single uniform questionnaire design, with particular attention being paid to equivalent question wording across languages. The format is face to face interview.

Our analytical sample for the most recent survey (2011) consists of 5652 men and women aged 20 to 45 who answered the question on fertility intentions, including 3556 childless respondents, 2096 respondents with only one child (Table 1). The analysis of people with two children or higher parities was precluded by the limited sample size.

The non-response rate was around 12%. A missing answer may be symptomatic of certain fertility plans (Morgan 1981, Morgan 1982). However, we simply excluded from the analysis all individuals who did not report any intended family size in order to avoid potential complications given the absence of auxiliary information on this item. The results obtained from the analysis run on the sub-set of valid responses are reliable under the standard "missing at random assumption" (Little and Rubin 2002).

The models are formally based on two levels: individuals and countries (referred to as "clusters"), as described in Table 1. As is shown in this table, the hierarchical structure is quite unbalanced. This lack of balance is not a problem, as it is efficiently handled by maximum-likelihood methods. The number of clusters and their sizes are sufficient to

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[2] We used only marginally the 2001 survey carried out in the original 15 EU countries.

achieve high levels of power and accuracy of the asymptotic distributions of the estimators (Snijders and Bosker 1999), and thus allow for reliable inferences.

TABLE 1 HERE

3.2 Response variables

Measuring childbearing intentions can present challenges, as intentions encompass several dimensions. The first distinction is between intentions/plans and ideals/desires: the number of children an individual intends/plans to have may not be the same as the number of children individuals would ideally like to have given no constraints. A second distinction is made between lifetime intentions (so-called child-number intentions or quantum intentions) and short-term intentions (so-called child-timing intentions or time-dependent intentions), which are parity-specific. Lifetime fertility intentions refer to the number of children individuals want to have over the whole life course and short-term intentions refers to a short-term framework to which the intentions are confined. A third distinction is made between childbearing intentions and the degree of certainty about those plans, which has been found to act as a strong predictor of future fertility behaviour (Westoff and Ryder 1977; Schoen et al.1999).

In this analysis the response variables are the number of additionally intended children and the certainty attached to the probability of realising the earlier stated childbearing intentions. Although economic recession may affect also child-timing intentions, we did not use this variable because the EB data did not contain any information on the time of other relevant events (such as, for example: finishing education, living parental home, entering a partnership, age at birth of the first child) to which these short-term plans could be usefully related. The lack of knowledge on the life course stage in which individuals are observed prevents a correct interpretation of the timing of childbearing, both actual and intended.

Lifetime fertility intentions were coded as a four-category variable: zero, one, two, and three or more children. Values greater than or equal to three were, in light of their low frequency, collapsed into a single category. The variable was surveyed through the following questionnaire item: "*How many (more) children do you intend to have?*" This prospective item came immediately after the question about the number of children already had ("*How many children, if any, have you had?*") and was clearly intended to provide information about the number of births respondents plan to have over (the rest of) their reproductive careers. Neither of the above-mentioned questions asked the interviewed people to make a distinction between biological and adopted children.

Certainty about fertility intentions was measured through the following survey item: "*How certain are you that you will have the number of children that you have just mentioned?*" Response options were: "very sure", "fairly sure", "not very sure", and "not at all sure". The related variable takes four categories reflecting the above mentioned response options. Importantly, only respondents who provided a valid numerical answer

other than "0 child" to the question on the intended number of children were asked about certainty level.

The choice to examine separately lifetime fertility intentions and certainty about those intentions has been motivated by the purpose to disentangle the effects of the economic recession exerted only on the quantum of intentions from those exerted only on the uncertainty of intentions. In reading the results one should keep in mind that uncertainty analysis is confined to people reporting positive fertility plans.

The questions on actual and additionally intended number of children, as well as the certainty of intentions were asked also in the 2006 round of the EB survey by using exactly the same question wording. These questions appeared with exactly the same order in the two survey's questionnaires (in 2006 and 2011), circumstance which allowed a comparative analysis over time of lifetime fertility intentions.

3.3 Explanatory variables

The individual-level explanatory variables include age, sex, enrolment in education, level of education, marital status, employment status, and self-location on the social scale. All of the covariates refer to the time of the interview. Unfortunately, the data did not carry any retrospective information concerning the previous history of respondents, which would have allowed us to estimate the role of biographical trajectories on the process of forming family size intentions in a dynamic framework.

The age of respondents is a continuous covariate, which was centred on the rounded mean value of 33 years. The other covariates, all categorical, were transformed into suitable dummy variables. Some collapsing of the categories was often needed: in such cases, several alternative collapsing schemes were tried in the model selection process. In the following, the covariates are described using the categorisation adopted in the final models.

The marital status takes four categories: single, married, cohabiting, and separated. The last category also includes divorced respondents, while the married respondents were grouped together with the remarried and the widowed people.

The educational level is a three-category variable with low (up to 15 years) medium (between 16 and 19) and high (20 years or above) level of education. A dummy variable indicating whether respondents were still enrolled in education was also considered. Education was measured in the EB through the following survey question: "*How old were you when you stopped your full-time education?*"

The employment status has just two categories: employed respondents and people not in the labour market or unemployed. A more refined breakdown of the variable was not supported by the data. Moreover, we were not able to make a distinction between long-term and short-term duration of unemployment spells.

The self-positioning on the social scale is a dummy coded to one if the respondents positioned themselves on the top five points in the related scale. The scale was described

to the respondents as follows: "*On the following scale, step 1 corresponds to the lowest level in the society and step 10 to the highest level in the society*".

The country-level explanatory variables include youth unemployment rates and gross domestic product (GDP) in purchasing power standards (PPS)[3], which measure the country economic situation; the share of enrolment in formal childcare for pre-school children, which measures enrolment rates in publicly subsidized childcare facilities, and the Gender Empowerment Measure (GEM), which measures the degree of women's political participation and access to economic resources.

We adopted a dynamic approach by considering changes in GDP and unemployment rates occurred over the period 2006-2011 rather than the GDP and unemployment rates as in 2006 and/or 2011. This choice is in line with the relevance of relative expectations, which suggests that a sudden deterioration in the economic situation is of higher importance than a bad economic situation because it frustrates earlier or well defined aspirations and expectations (Easterlin 1980).

Similarly, we considered individuals' assessment of their country and their own economic situation over the past five years rather than at the current time (i.e. the time of the survey). They were measured through the following question: "*Compared with five years ago, would you say things have improved, gotten worse or stayed about the same when it come to ...?*" Response options were: '*better*' '*worse*' '*same*' '*don't know*'. Individuals' subjective perceptions of their country's and their own economic situation were included in the models as dummy variables coded to 1 if a worsening in any of the specific situations[4] was perceived; the selected items include: cost of living in the country, affordability of housing in the country, country economic situation, country employment situation, household financial situation, job personal situation.

All the perception variables were considered both at individual- and country-level (share of people reporting a worsening of the country situation). To maintain the parsimony in the models while considering these variables also at country-level and to compare objective measures of the country economic performance with individuals' subjective perceptions of it, we estimated two separate sets of models, one including the changes in GDP per capita and youth unemployment rates in the country, and one including the country means of individuals' perceptions about the past socioeconomic situation in the country.

A description of all the variables used in the models is reported in Table 2.

TABLE 2 HERE

3.4 The model

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[3] The volume index of GDP per capita in purchasing power standards is expressed in relation to the European Union (EU-27) average, set to equal 100. If the index of a country is higher than 100, this country's level of GDP per capita is higher than the EU average, and vice versa. The basic figures are expressed in PPS; i.e., in a common currency that eliminates the differences in price levels between countries, which allows for more meaningful volume comparisons of GDP between countries

[4] Overall, 15 different items were listed in this survey questions.

Multilevel analysis was used to regress the additionally intended number of children, and the certainty about those intended number of children, respectively, on a set of individual- and country-level covariates. The multilevel analysis relies on the random intercept version of the proportional odds model for ordinal responses (e.g., Agresti, 2002).

In the model presented below Y_{ij} denotes the response variable of individual i of cluster (i.e., country) j ($i = 1, \ldots, n_j$, $j = 1, \ldots, J$) and $\mathbf{x}_{ij}$ is the corresponding vector of covariates, including both individual-level and cluster-level variables. Moreover, u_j denotes the cluster-level error term, also called random effect. Throughout the analysis we made the standard assumptions on random effects, namely: (i) the random effects are independent and identically distributed following a normal distribution with zero mean and an unknown, estimable variance σ_u^2; (ii) the random effects are independent of the covariates. [5]

When the response variable is ordinal, taking the values $1, 2, \ldots, M$, one can define $\gamma_{ij}^{(m)} = P(Y_{ij} \leq m \mid u_j)$ and adopt the random intercept *proportional odds* model, which can be viewed as a set of linear models for the M-1 cumulative logits:

$$\log\left(\frac{\gamma_{ij}^{(m)}}{1 - \gamma_{ij}^{(m)}}\right) = \tau^{(m)} - \left(\alpha + \boldsymbol{\beta}'\mathbf{x}_{ij} + u_j\right) \qquad m = 1, \ldots, M-1, \tag{1}$$

where α is the intercept, $\boldsymbol{\beta}$ is the vector of regression coefficients and $\tau^{(m)}$ are the cutpoint parameters. The cutpoints must be ordered, $\tau^{(1)} \leq \tau^{(2)} \ldots \leq \tau^{(M-1)}$, and the first cutpoint, $\tau^{(1)}$, is fixed to zero for identifiability reasons. The minus sign preceding the linear predictor is necessary in order to interpret the effects of the covariates in the more natural way (i.e., a positive regression coefficient means that higher values of the covariate tend to yield higher values of the response variable).

The assumption that the vector of regression coefficients $\boldsymbol{\beta}$ is constant for all the M-1 cumulative logits, sometimes called the *parallel regression assumption*, leads to the *proportional odds* property, i.e., the ratio of the odds of two individuals does not depend on the category. The parallel regression assumption is very convenient for parsimony and interpretation, and can be checked using, for instance, the test developed by Brant (1990).

Since the individual-level variance implied by the logit link is $\pi^2/3$, the intraclass correlation coefficient is $\sigma_u^2 / \left(\sigma_u^2 + \pi^2/3\right)$ for the proportional odds model (Snijders and Bosker 1999).

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[5] The assumption that the random effects are independent of the covariates is analogous to the independence assumption on the error terms usually made in standard linear regression. However it should be noted that the independence assumption concerning the random effects is not as stringent as it may appear, since Snijders and Bosker (1999) show that if the random effects are correlated with an individual-level variable, such correlation is removed as soon as the cluster mean of such variable is introduced as a further covariate.

The present analysis concerns the intended number of children, and the certainty of realising such intentions, which are both ordinal variables, thus a natural choice is to study them by using proportional odds models. These models could be extended to handle partial proportional odds (Williams 2006), but then the interpretation becomes somewhat tortuous. Since only a few covariates in each model violated such an assumption, and since they did so only slightly, the proportional odds multilevel models were preferred. The significance of the variances of the random effects was assessed with the likelihood ratio test with corrected *p*-value, which has been found more reliable than the Wald test.

All of the models were run separately by parity: zero, and one. This is because fertility intentions may change after each new birth, in line with the rational choice theories approach (Yamaguchi and Ferguson 1995) and the conditional-sequential fertility decision-making process (Namboodiri 1972). We did not look at people with two children or higher-order births because of data limitation. We are, however, reassured by the fact that fertility response to economic recession is more pronounced among young people who are typically the groups most severely exposed to the negative consequences of the economic downturn (Kravdal 1999; Neels 2010).

4. Results

4.1 Lifetime fertility intentions: changes over time

At the EU-15 level the mean ultimately intended family size of women and men of reproductive ages has been stable at around two children in the decade 2001-2011 (Figure 3).[6]

<div align="center">**FIGURE 3 HERE**</div>

This temporal stability at the EU-15 aggregate level is supported by the evidence provided in Figure 4 for the enlarged European Union at 27 countries (EU-27) over the period 2006-2011. In this scatter plot most of the countries lie around the diagonal identifying the points with identical mean UIFS in 2006 and 2011, pointing out that there was only little temporal variation during these 5 years. Only eight countries show below-replacement values in Figure 4, namely: Italy, Spain, Portugal, Germany, Austria, the Czech Republic, Slovakia and Romania. Austria had the lowest levels of 1.55 and 1.68 in 2006 and 2011, respectively; these are levels exceptionally low as emphasised in previous research (Goldstein et al. 2003). Two countries are clearly outliers in Figure 4: Ireland and Cyprus, with mean values exceptionally high, above 2.5, in both the survey rounds.

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[6] Owing to the process of enlargement of the EU, only 15 of the current 27 members were present in the 2001 round of the EB. The countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. In 2004, the Union became the EU-24 with the joining of Cyprus the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia; while in 2007 the addition of Bulgaria and Romania led to the creation of the EU-27 Union.

FIGURE 4 HERE

Most of the other EU countries lie in the bottom right triangle of the graph area, which identifies the points with negative changes. The changes are, however, very small, as suggested by the fact that most of the countries are located just slightly below the diagonal line of constant points. Greece, for example, observed a reduction of -0.14 children. In Luxembourg and Cyprus the decrease was -0.16 and -0.35, respectively but these trend can be due to fluctuations caused by the very small sample sizes which were halved in these two countries in comparison to those of the other EU countries. Bulgaria and Sweden recorded a decline of -0.18 and -0.20, respectively. In the rest of EU the decline was of a smaller size or not decline at all was observed (Figure 4, panel a). This picture changes quite a lot by looking at the childless sub-sample. In this case, a non marginal decrease in the mean ultimately intended family size (ranging between -0.1 and -0.3) occurred in several countries, namely: Greece, Belgium, Denmark, Sweden, France, Poland, Hungary, Cyprus, Italy and Portugal (Figure 4, panel b). The higher level of temporal variation in the childless sub-sample is also indicated by the lower correlation between the 2006 and 2011 values than that observed in the whole sample.

Focusing on the PIIGS countries, which were most severely affected by the economic crisis, one can see that among childless Greeks of reproductive ages the mean values went down from 2.03 in 2006 to 1.74 in 2011 (-0.29) (Figure 5, panel a). In Portugal and Italy the decrease was of -0.11 and -0.12, respectively, these values are close to the EU-27 average (-0.11). In Ireland a substantial stability was observed, while in Spain a slight increase was recorded (+10) (Figure 5, panel a). As shown in Figure 8 (panel b), the temporal variation was much less pronounced in the sub-sample of people with one child: Greece registered a decline of just -0.07, very similar to that of the EU-27 on average (-0.05). In Italy and Portugal the reduction was of -0.01 and -0.09, respectively, while Spain and Ireland registered an increase of +0.21 and +0.04, respectively (Figure 5, panel b).

FIGURE 5 HERE

4.2 Uncertainty about lifetime fertility intentions: changes over time

As suggested by the scatter plot of Figure 6, uncertainty about lifetime fertility intentions increased over the period 2006-2011. Most of the EU countries lie in the top left triangle of the graph area, above the diagonal line identifying the points of constant values over time. As can be seen, the cross-country variation is quite relevant. Greece and the other PIIGS countries, with the only exception of Italy, registered the largest increase in the share of people uncertain about lifetime fertility intentions. The rise was +0.22 percentage points in Greece, +0.16 in Portugal, +14 in Spain and +12 in Ireland. Surprisingly, in Italy the proportion of uncertain people decreased from 37% to 29%. A

similar temporal decrease was observed also in other countries, namely: Finland, Belgium, the Netherlands, Luxembourg, Hungary, Poland, and Malta.

FIGURE 6 HERE

4.3 Mean certain ultimately intended family size

By weighting the mean additionally intended family size (AIFS) with the share of certain people and summing up these weighted means with the mean actual family size, we construct a measure, so called *mean certain ultimately intended family size* (CUIFS)*,* which can be considered the most predictive indicator of people's completed family size. Indeed, when asked to attach a certainty level to their reproductive intentions people are forced to think realistically about their future plans. Thus, the mean certain ultimately intended family size is necessarily lower than the mean ultimately intended family size. Indeed, the former was as low as 0.9 for childless people of reproductive ages in the EU-27 in 2011**,** while the latter was about 1.6 children for the same group of people (Figure 7, panel a). This means that uncertainty produced a decrease of about 0.7 in the mean ultimately intended family size of childless women and men of reproductive ages at the EU-27 level. This effect varied across countries: Greece and Ireland were most severely affected by a reduction of their mean ultimately intended family size due to uncertainty, as suggested by the slopes of their curves (Figure 7, panel a). In Ireland, a striking decrease of 1.4 children was observed going from un-weighted to weighted mean ultimately intended family sizes. In Greece and Spain the reduction was of almost 1 child, while it was of a smaller amount in Portugal (-0.6) and Italy (-0.5). The shrinking of intentions due to uncertainty was much less steeper among people with one child: the decline was of around -0.2 at the EU-27 level; reductions of similar size were recorded in most of the PIIGS countries, namely: Greece, Portugal and Spain (-0.3). In Italy the weighting procedure produced only a very tiny decrease of just -0.07, while in Ireland a decrease of about -0.5 was observed (Figure 7, panel b).

FIGURE 7 HERE

These patterns suggest that temporal variations in the intended family size in 2006-2011 might have been driven by changes in uncertainty levels, which typically make them a more realistic approximation of people's completed family size.

4.4 Individuals' subjective evaluation of the past, current and future socioeconomic situation in the country and in their household

Arguably, the perception of the crisis can be of higher relevance than the crisis *per se* in shaping individuals' birth plans. This is supported by research showing the fertility responses to changes in consumer confidence (Fokkema et al. 2008). The economic

recession is consistent with the Europeans' general pessimism about the past, current, and future economic situation of their country (see Table A.1 in the Appendix and Testa 2012, for a broad overview) and their own households, which is conducive to higher uncertainty in general, and to higher reproductive uncertainty. The negative climate of opinions, although widespread all over the Europe, affected Greece more heavily than any other EU country. Greek women and men of reproductive ages were particularly concerned about their household's financial situation: 72% of Greek women and men reported a worsening in their household's financial situation over the past five years, similar percentages were considerably lower in most of the other EU countries. They were just slightly above 50% in Ireland and Portugal, and 29% and 42%, respectively, in Italy and Spain. In Bulgaria, Romania, Hungary and Latvia shares were close to 50%, while in the rest of EU only a minority of people of reproductive ages expressed a pessimistic view about household financial conditions (Figure 8). Unlike the other PIIGS countries, Greeks did also have negative expectations for the future: 60% of them expected a further worsening of their financial situation, while the percentages were 30% in Portugal, 26% in Ireland and 11% in Italy and Spain.

FIGURE 8 HERE

In the next section, we examine the determinants of both intentions and uncertainty with the aim to see whether they were significantly influenced by objective changes in the economic performance of the country (as measured by GDP per capita and youth unemployment rates), or perceived changes in the socioeconomic situation of the country (as measured by perceptions of a worsening in any of the items considered above), over the period 2006-2011.

4.5 Predictors of lifetime fertility intentions and reproductive uncertainty

As shown in **Table 3**, at parity zero, lifetime fertility intentions are positively correlated with enrolment in education, level of completed education, and a high self-positioning of individuals on the social scale. Conversely, they are negatively correlated with age and being unemployed. Similar results were obtained for people with one child, apart from two important exceptions: the coefficient on unemployment status was no longer statistical significant, while being single or separated were negatively and statistically significant associated with lifetime fertility intentions. At the country-level, the effects of unemployment and GDP per capita pointed to opposite results. Surprisingly, changes in youth unemployment rates occurred in the period 2006-2011 were positively correlated with lifetime fertility intentions. This result held true for both childless people and people with one child. At parity one, fertility intentions were also negatively correlated with the changes recorded in the GDP per capita over the period 2006-2011, which means that countries with less sever reductions in GDP per capita were the countries in which people expressed higher fertility intentions. The country-level variance was statistically significant, supporting the appropriateness of adopting a multilevel

approach. Going from the model with only individual-level variables (model II in Table 3) to the model with both individual- and country-level variables (model III in Table 3), the cross-country variance decreased significantly: from 0.12 to 0.06 in the childless sub-sample, and from 0.11 to 0.01 in the sub-sample with one child. This result indicates that the selected country-level predictors explained a considerable share of the country-level variance in the response.

TABLE 3 HERE

As shown in Table 4, uncertainty about reproductive intentions was positively associated with age, number of intended children, and being separated or single, while it was negatively associated with the individuals' high self-positioning on the social scale. None of the two country-level variables of interest was statistically significant, and even more, their effects were found to be close to zero. This seems to suggest that the main impact of the economic recession on reproductive plans was exerted on their quantum rather than on their certainty levels.

TABLE 4 HERE

The same models shown in Table 3 and 4 were replicated using the individuals' perceptions about their country socio-economic situation. Results are shown in Table 5 for both lifetime intentions (first three columns of Table 5) and uncertainty about realising them (last three columns of Table 5).

The estimates show quite surprisingly, but in agreement with the results already seen for the change in the youth unemployment rates (Table 3), that childless individuals expressed higher fertility intentions in those countries with higher shares of people perceiving a worsening in the country employment situation over the past five years (Table 5, first column).[7] We interpreted this result with the circumstance that countries with a stronger increase in youth unemployment rates are also those with initial higher levels of youth unemployment rates, higher share of women and men postponing childbearing, and thus, larger proportions of people including all the intended children in the prospective component of their ultimately intended family size. At parity one, intentions were negatively associated with a perceived worsening in the household financial situation over the past five years. The effect was found to be significant both at individual- and country-level, although the latter had a smaller magnitude and a weaker statistical significance than the former. Another important factor negatively and statistically significantly correlated with individuals' fertility intentions was the share of people perceiving a worsening in the affordability of housing in the country (Table 5, second column).

Uncertainty about reproductive plans was positively associated with the individuals' perception of a worsening in their household financial situation at parity zero (Table 5, third column), and with the individuals' perception of a worsening in the

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[7] We checked whether this result could be due to the collinearity between the variable on the perception of the country employment situation and the variables on the perception of other socioeconomic aspects which were also included into the models. We found that the level of correlation between these variables was not that high to be responsible for these counterintuitive result and we decided to consider each of perception items rather than a factor synthesising them.

country economic situation at parity one (Table 5, last column). We also got a counterintuitive finding for the item 'affordability of housing', which was found to be negatively associated with uncertainty, contrary to what one might expect.

TABLE 5 HERE

4.6 Impact of changing unemployment rates and GDP per capita on changes in lifetime fertility intentions and reproductive uncertainty: a quasi-panel analysis

In the previous analysis only the country-level covariates unemployment rates and the GDP per capita could be considered in a dynamic way, by computing the changes occurred in the 5-year period. The dependent variable, either the number of children intended or the level of certainty in the stated intended family size, as reported by the interviewed individuals, could be considered only in a static way, i.e., as measured at the time of the most recent survey (2011). By merging the 2006 and 2011 rounds of the EB survey by country and birth cohort,[8] we could analyse dynamically also the dependent variable by computing the changes in the intended family size and their related certainty levels occurred over the 5-year period. Because the merge refers to repeated cross sections, the changes refer to the mean change occurred within the cohorts rather than the changes observed for the same individuals over time.

We employed random intercept multinomial logistic regression models to regress cohort changes in fertility intentions and uncertainty on a set of cohort-level and country-level explanatory variables. The results, which are synthetically reported in Table 6, show that stability in cohorts' mean intended family size are negatively and statistically significant associated with increases in youth unemployment rates and that constancy and increase in cohort's reproductive certainty are negatively and statistically significant associated with increases in youth unemployment rates. For the sake of simplicity we present in Table 6 only the estimates related to the country-level variables change in GDP per capita and in youth unemployment rates. The models are controlled for all the variables included in the models of Tables 3 and 4 and, in addition, for the cohorts' mean number of children, since the models are not stratified by parity. Interestingly, temporal stability or increase in cohorts' mean intended family size and certainty of intentions is higher in older cohorts, suggesting that at young ages childbearing plans are just provisional and highly exposed to the risk of change according to the life course events. The effect of increasing unemployment rates does not vary across cohorts (results of the related interaction models are not shown but available upon request).

TABLE 6 HERE

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[8] Because not all the birth cohorts interviewed in 2006 were also interviewed in 2011 within each country, we merged the two datasets by each 5-year birth cohort not to lose information and getting biases into the estimates.

5. Discussion

In this paper we have examined the relationship between lifetime fertility intentions and the economic recession by using the Eurobarometer data (2006 and 2011) on individuals clustered in the 27 EU countries. Our findings show that a decline in the ultimately intended family size occurred in Greece and appeared reinforced when uncertainty levels of fertility intentions are taken into account. Uncertainty linked to reproductive plans increased in almost all the PIIGS countries (with the only exception of Italy) and was particularly pronounced in Greece, Ireland, and Portugal.

We collected several pieces of evidence to suggest that this temporal change is linked to the economic crisis. First, we found that people who perceived a worsening in their country's economic situation as well as in their household's financial situation in the period 2006-2011 were more likely to report lower fertility intentions in 2011 than those more optimistic; the effect was particularly strong for childless people. These effects are exerted at the individual but not at the country level. It is remarkable, however, that the individual effect of such subjective assessments remains relevant even after controlling for the status of being unemployed at the time of the survey which, indeed, has a negative and statistically significant effect on lifetime fertility intentions of childless people. Second, we demonstrated that the decrease in the fertility intentions of given age cohorts over the years 2006-2011 was associated with the increase in the country's youth unemployment rates in the same period (Table 6). This result was robust to the inclusion of a set of country-level variables which could be good predictors of intentions' changes, like the GDP per capita changes, availability of childcare services for pre-school children, or Gender Empowerment Measures in 2006.

Our analysis also suggests that the negative link between reproductive intentions and economic recession works mainly through the increase in uncertainty attached to the stated fertility plans. The relevance of reproductive uncertainty in shaping fertility intentions is evident if we look at the drastic changes in the mean ultimately intended family size due to the inclusion of uncertainty in the intended number of children (Figure 7). Moreover, according to our findings changes in youth unemployment rates do not have a significant impact on the individual's fertility intentions, as reported in 2011, but when we considered the levels of youth unemployment rates in 2011 rather than the temporal changes in 2006-2011, we found that youth unemployment rates were positively and statistically significant associated with both intentions and uncertainty attached to them (results of these latter models are not shown in the paper but available upon request). This finding indicates that a worsening in the country economic performance may be associated with a preference for large family sizes. Fertility postponement offers a good interpretation for reading this result: countries in which postponement is stronger – also as a consequence of the economic recession – may be those in which people report a preference for larger families because they include all the desired children in the prospective component of their reproductive life.

At first glance, our study suggests that fertility intentions across the EU have not been largely affected by the "Great Recession". However, as we show in Section 2, the recession has differed hugely in intensity across the continent. In Greece, arguably the hardest hit economy in terms of unemployment and austerity measures brought about as a

consequence of the sovereign debt crisis, we observe that fertility intentions have, indeed, been negatively affected. The 'timeline' of the recession is such that we cannot conclude that Greece is such an outlier in terms of the ongoing change in fertility intentions. Since 2011, economic conditions have worsened considerably in Spain, for example. Furthermore, austerity packages in place not just in the 'PIIGS', but also else in the EU are starting to have measurable impacts upon social spending and family policy. To take a further example – Portugal had, until recently, been hailed as a success story in terms of how the population generally acquiesced to austerity measures in the face of a sharp decline in GDP and sovereign debt problems. However, in September 2012 after the announcement of the 2013 budget where Finance Minister Vitor Gaspar confirmed the average income tax rise would increase from 9.8% in 2012 to 13.2% - riots have flared in Lisbon (Telegraph, 2012). This suggests that as the Recession is not yet over, the 'true' picture of the impact upon fertility intentions across Europe may not be seen until after analysis of the 2016 EB. This study, however, does indicate that the stable fertility intentions which have characterised much of Europe over the past ten to fifteen years can, in fact, be responsive to such social and economic developments.

The study has some caveats. With only three cross-sections (only two for intentions weighted by uncertainty) it is not possible to disentangle whether the declining pattern is the result of a long-lasting trend or rather a new pattern which introduces a discontinuity with the past. With the EB we are not able to go further backwards. One possibility could be to compare the EB data with external datasets related to earlier years (before 2001). However, we believe that comparison across time and countries would be hindered by the availability of different fertility intentions measures, given that different question wordings are normally used for measuring fertility intentions in different surveys. Moreover, we could not study temporal changes in intentions and uncertainty occurred to the same individuals given that the repeated EB cross-sections do not track individuals over time. We could, however, examine changes within birth cohorts of interviewed people and see whether some cohorts were more affected by the changes produced by the economic recession than others through the inclusion of appropriate interaction terms. We found that the effect of increasing youth unemployment rates on intentions and uncertainty was the same across cohorts (results of these interaction models are not shown in the paper but are available upon request). A final caveat concerns the reliability of the EB data which contain only small national samples and question the robustness of our results. While recognising that quality of the data is an issue for the EB surveys, we want to point out that the EBs are the only harmonized data sources allowing a cross-national dynamic comparative analysis of lifetime fertility intentions and uncertainty in all the countries of the European Union.

An important observation should be made regarding policy. Bridging the 'gap' between fertility intentions and actualised fertility has been a cornerstone of EU-wide family policy since the era of low- and lowest-low fertility across Europe (MicMac, 2010). While fertility intentions have declined in some settings – and could decline in others – if the 'gap' becomes smaller it will more likely be as a result of a *lack* of supporting social and family policy rather than as a *consequence* of 'bridging the gap.'

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# Figure 1: Recent trends in pTFR in the EU-27
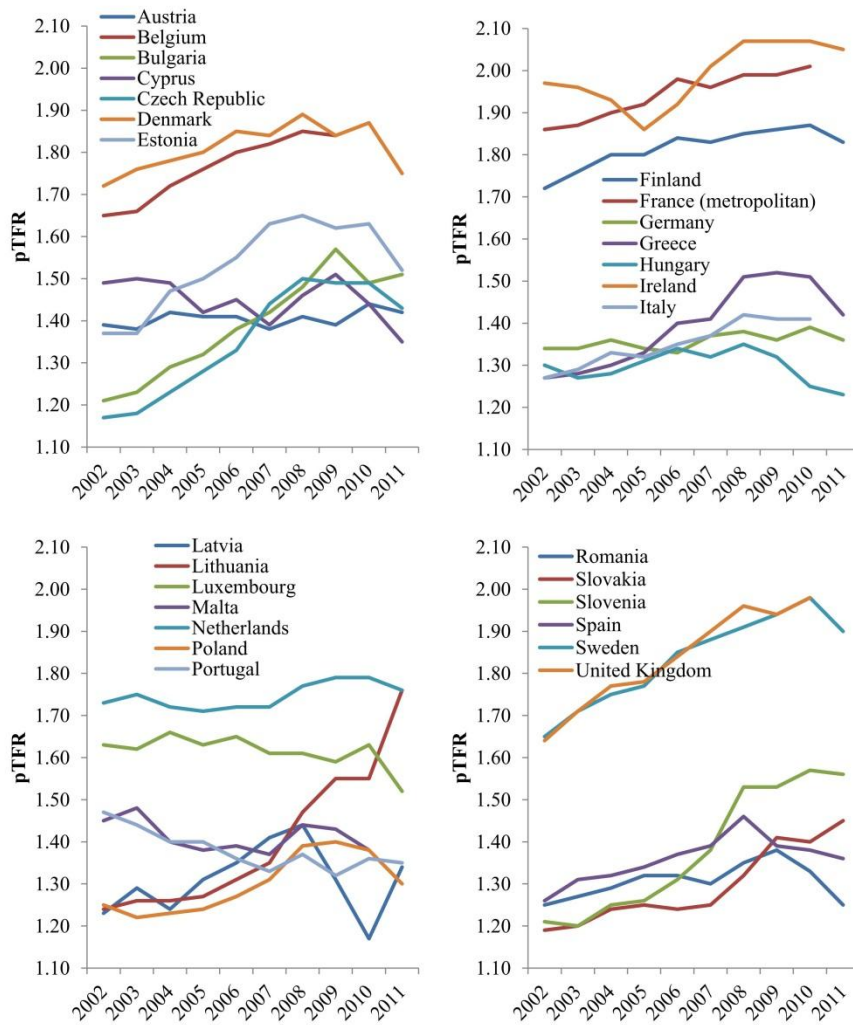
Source: (Eurostat 2011)

Figure 2: Harmonised unemployment rates (%), EU member states and other territorial units

(a) EU, USA and Japan

(b) 'PIIGS'

(c) Unemployment >10%

(d) Unemployment 7.5-10%

(d) Unemployment 6.0-7.5%

(e) Unemployment <6.0%
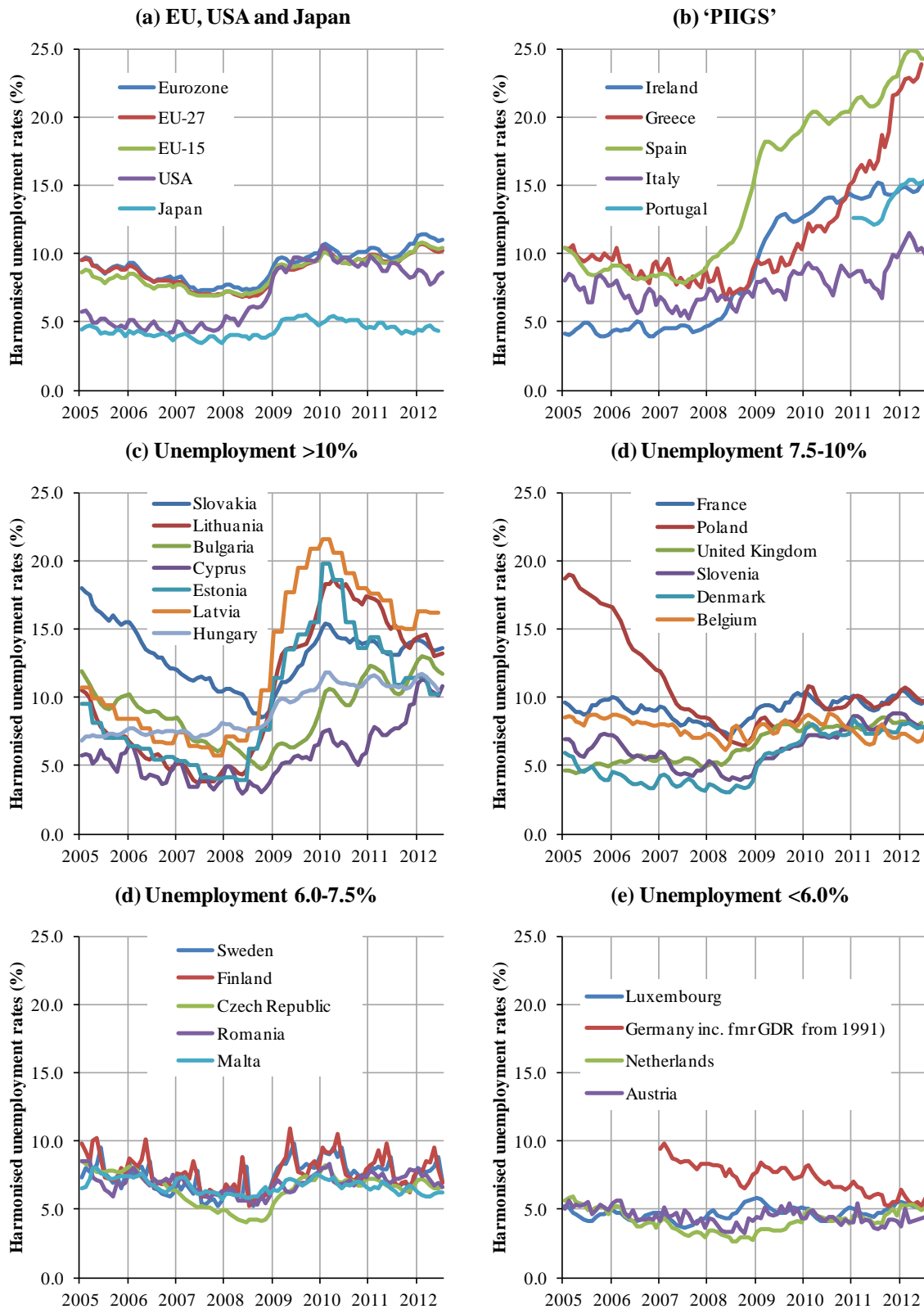
Source: (Eurostat 2011)

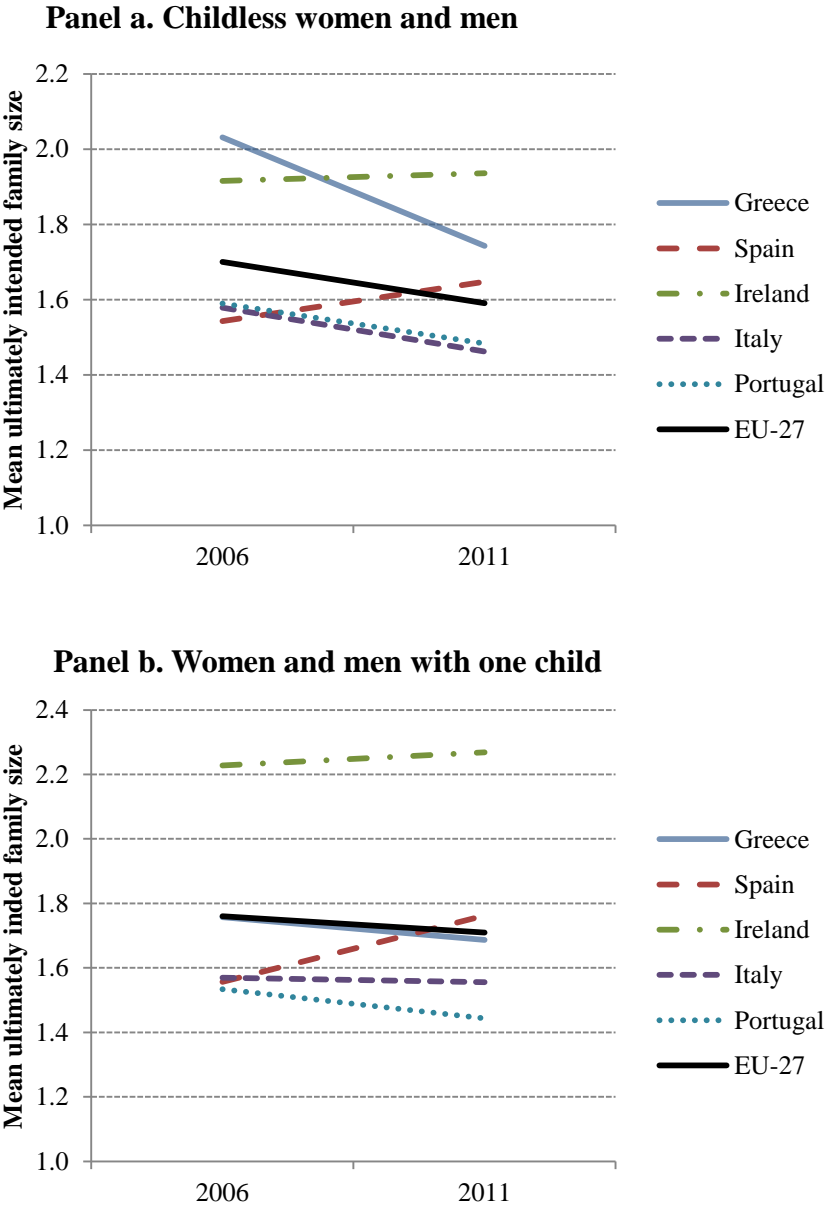**Figure 3 Mean ultimately intended family sizes of women and men aged 20 to 45. EU-15. Years 2001, 2006 and 2011.**
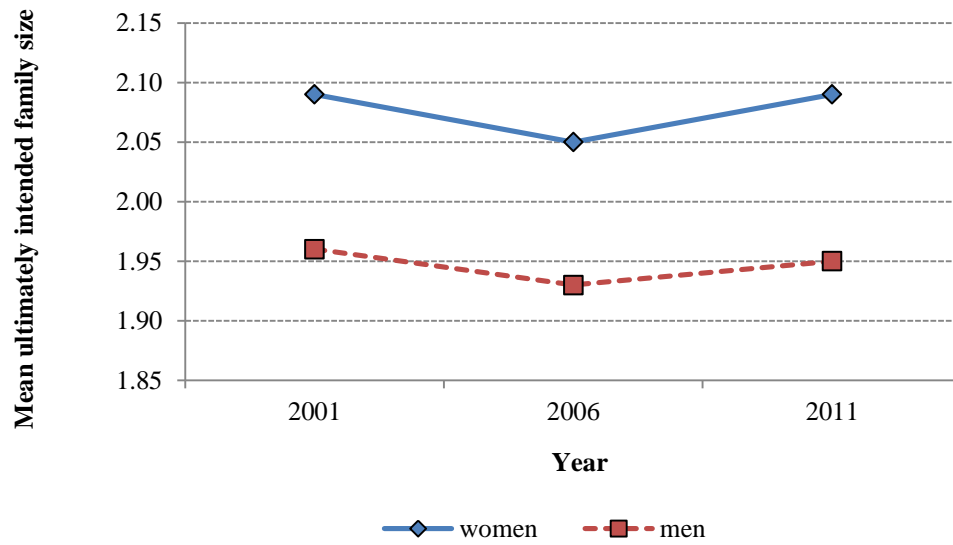
Figure 4 Mean ultimately intended family size in the 27 EU countries. Women and men aged 20 to 45. Years 2006 and 2011

Panel a. All women and men

Panel b. Childless women and men
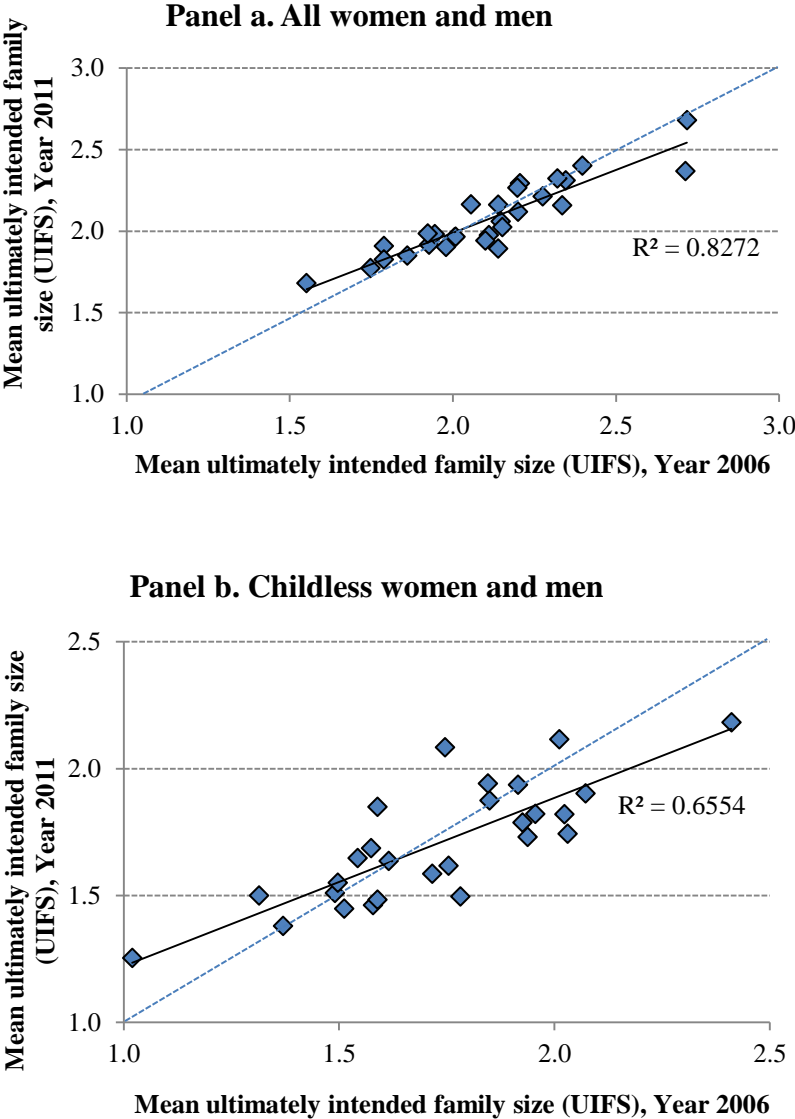
Note. The diagonal dashed line identifies the points with identical mean values in 2006 and 2011. It draws two triangles in the graph area: the bottom-right one, which identifies the country-points with declining mean values over time, and the upper left one, which identifies the country-points with increasing mean values over time.
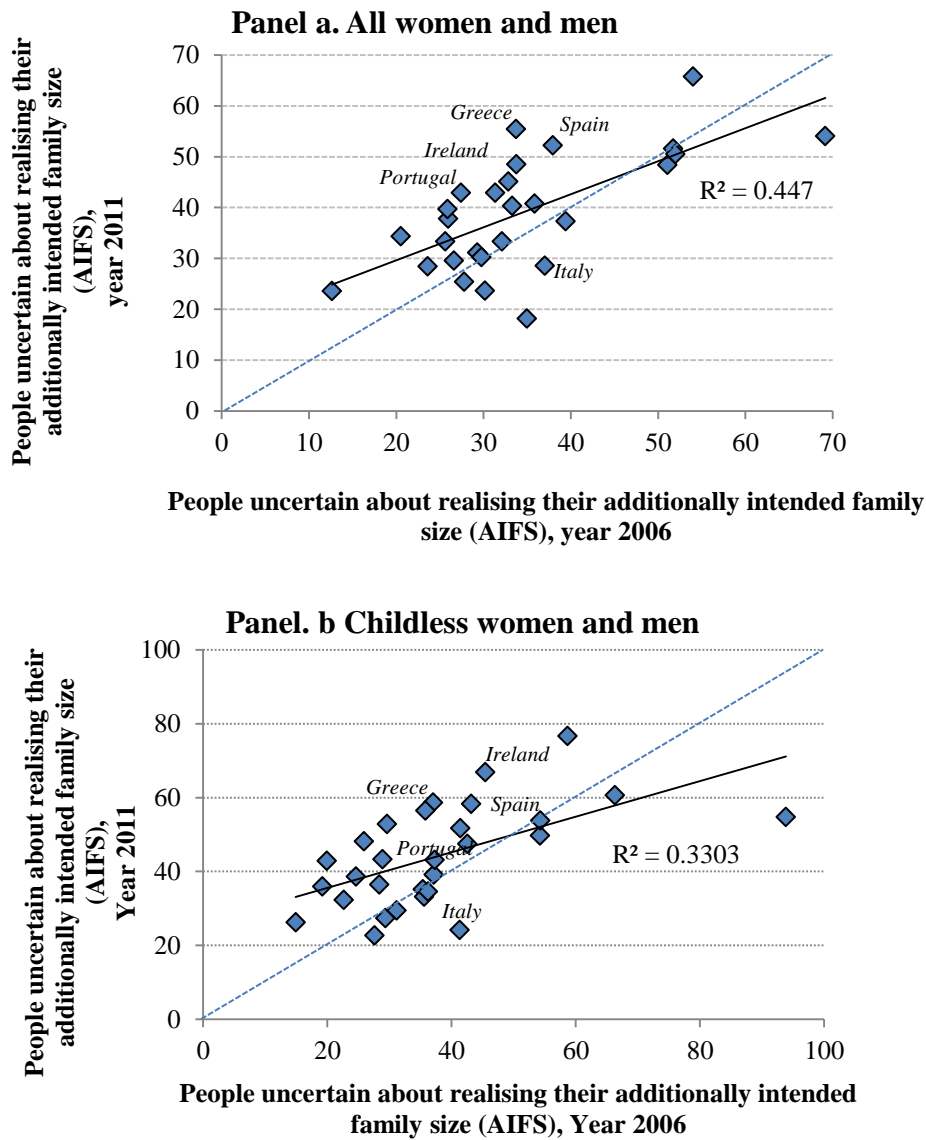
Source: authors' elaboration on Eurobarometer surveys, several years

Figure 5: Mean ultimately intended family size (UIFS). Women and men aged 20 to 45. PIIGS countries and EU-27. Years 2006 and 2011

Panel a. Childless women and men

Panel b. Women and men with one child

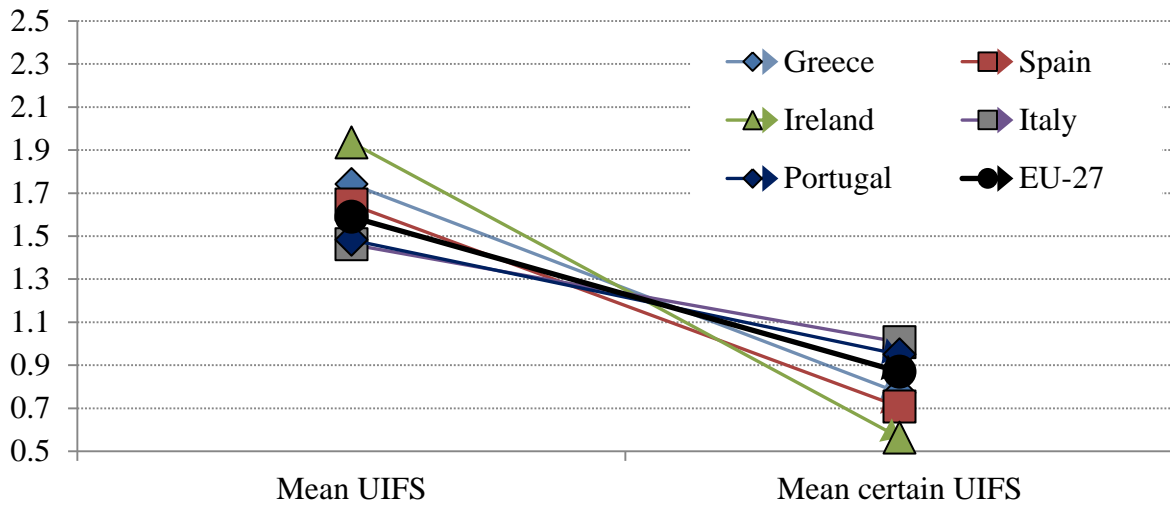*Source:* authors' elaboration on Eurobarometer surveys, several years

Figure 6: Share of people uncertain about realising their stated lifetime fertility intentions. Women and men aged 20 to 45. 27 EU countries. Years 2006 and 2011
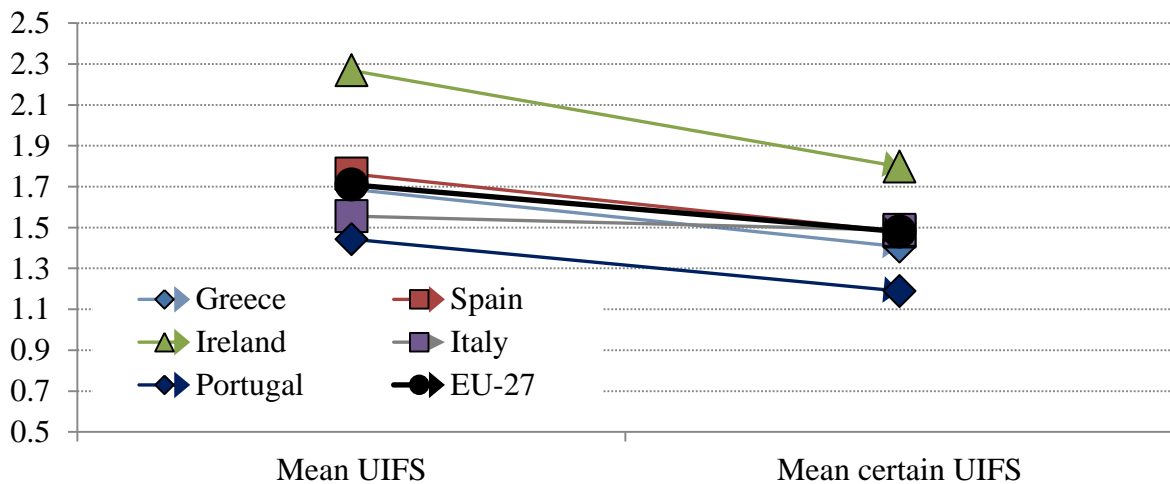
Panel a. All women and men

Panel. b Childless women and men

Source: authors' elaboration on Eurobarometer surveys, several years

Figure 7: Mean ultimately intended and certain ultimately intended family size. Women and men aged 20 to 45. PIIGS countries and EU-27. Year 2011.

Panel a: Childless men and women

Panel b. Women and men with one child

Source: authors' elaboration on Eurobarometer survey, 2011

Figure 8: Share of people of reproductive ages (20-45) perceiving a worsening in their household financial situation over the past five years, or expecting a worsening in the next twelve months. 27 EU countries. EB2011

Panel a) Over the past 5 years (i.e., 2006-2011)

Panel b) in the next twelve months (i.e., year 2012)
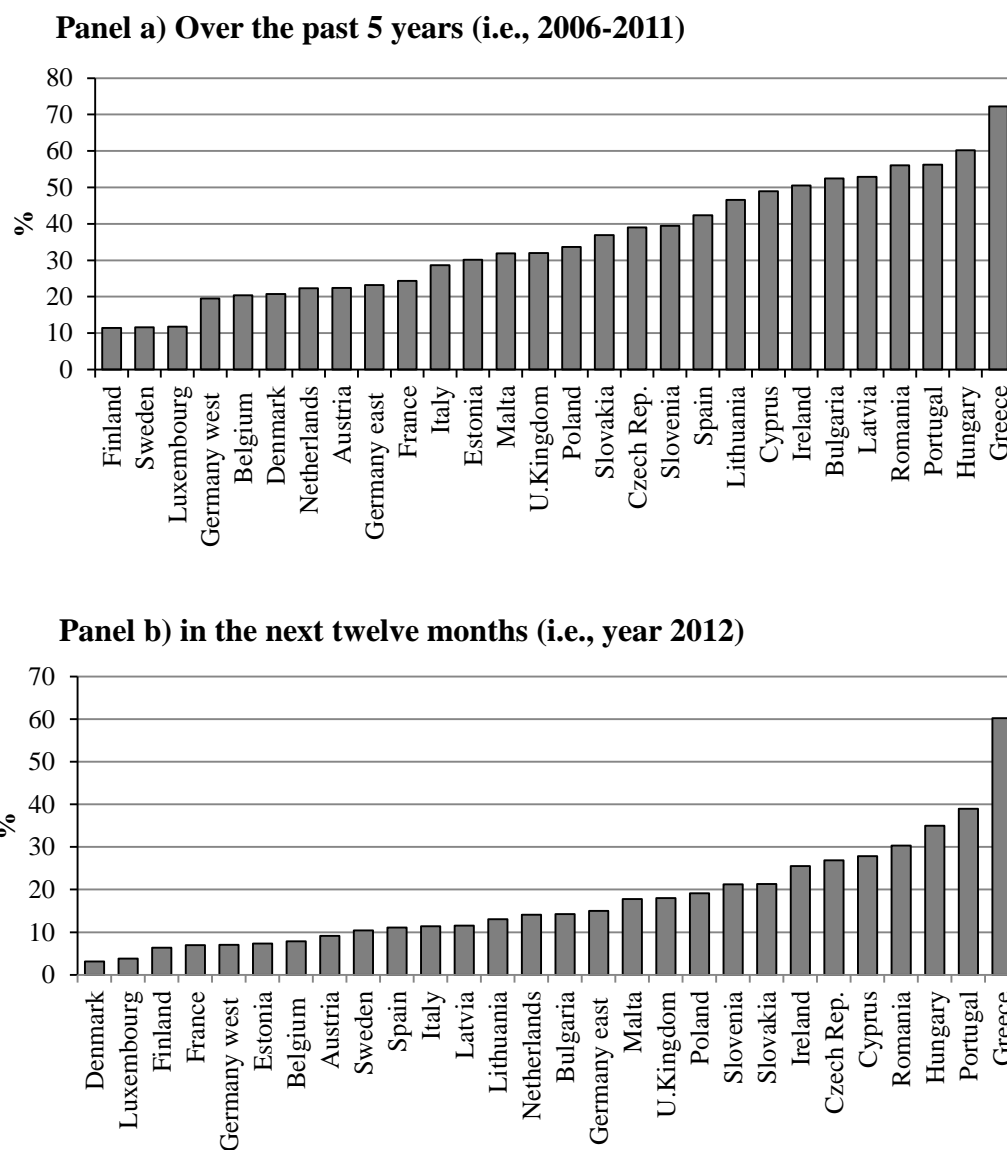
Source: authors' elaboration on Eurobarometer survey, 2011

Table 1. Structure of the data: respondents aged 20 to 45 by country and parity

COUNTRIES	PARITY ZERO	PARITY ONE
Austria	174	75
Belgium	149	71
Bulgaria	104	107
Cyprus	98	24
Czech Rep.	145	101
Denmark	122	57
Estonia	115	95
Finland	91	44
France	123	76
Eastern Germany	103	47
Western Germany	124	55
Greece	209	68
Hungary	130	95
Ireland	96	73
Italy	169	83
Latvia	151	147
Lithuania	141	82
Luxembourg	72	43
Malta	48	33
Netherlands	164	41
Poland	95	67
Portugal	119	99
Romania	135	126
Slovakia	125	89
Slovenia	137	67
Spain	177	86
Sweden	85	49
Great Britain	125	76
North Ireland	30	20
Total	3556	2096

Table 2. Description of the individual- and country-level variables used in the analysis. Ages 20-45. Values in percent

Individual-level variables.

	PARITY ZERO	PARITY ONE
Age (average)	29	34
Female	45	62
Male	55	38
Married	16	62
Cohabiting	26	18
Single	56	11
Separated	2	9
Low education	6	10
Medium education	40	53
High education	35	36
Enrolled in education	20	1
Employed	64	74
Unemployed or inactive	36	26
Low self-positioning on the social scale	45	53
High self-positioning on the social scale	55	47
Perceived worsening over 2006-2011 of:		
Cost of living in the country*	77	83
Affordability of housing in the country	65	68
Country economic situation	69	70
Country employment situation	63	64
Household's financial situation	27	35
Personal job situation	23	30

Note. * Country refers to the country in which respondents live at the time of the survey.

Table 2 (continued): *Country-level variables*

	Youth Unempl. Rates, 2011	Youth Unempl. Rates, 2006	GDP per capita, 2006	GDP per capita, 2011	GEM	CHILD CARE
Austria	8	9	129	125	0.82	69
Belgium	19	21	118	118	0.86	98
Bulgaria	25	18	45	37	0.60	75
Cyprus	22	10	92	91	0.58	85
Czech Rep.	18	18	80	77	0.62	67
Denmark	14	8	125	124	0.86	96
Estonia	22	12	67	65	0.61	85
Finland	20	19	116	114	0.85	70
France	23	22	107	109	0.72	94
western Germany	9	14	120	116	0.82	93
eastern Germany	9	14	120	116	0.82	93
Greece	45	25	82	93	0.61	61
Hungary	26	19	66	63	0.56	79
Ireland	30	9	127	145	0.75	93
Italy	29	22	101	104	0.65	91
Latvia	31	14	58	52	0.62	66
Lithuania	33	10	62	55	0.64	57
Luxembourg	17	15	274	272		51
Malta	14	16	83	77	0.49	55
Netherlands	8	8	131	131	0.84	89
Poland	26	30	65	52	0.61	30
Portugal	30	20	77	76	0.68	64
Romania	24	21	49	38	0.49	67
Slovakia	33	27	73	63	0.60	77
Slovenia	16	14	84	88	0.60	67
Spain	47	18	99	105	0.78	91
Sweden	23	22	126	121	0.88	92
U. Kingdom	21	14	108	120	0.76	89

Legend: GEM: Gender Empowerment Measure; CHILD CARE: Preschool children enrolled in formal childcare.

Source: Eurostat for unemployment rates and GDP; OECD family policy database for pre-school children enrolled in childcare services; United Nations Development Programme, Report 2006, for gender empowerment measure.

Table 3 Estimates from the random intercept ordinal regression models on lifetime fertility intentions. Beta coefficients. EB 2011.

	Parity 0						Parity 1					
	Model I		Model II		Model III		Model I		Model II		Model III	
Individual-level variables												
Age-33 (average)	-		-0.15	***	-0.15	***	-		-0.17		-0.17	***
(Age-33)^2	-		-0.01	***	-0.006	***	-		-0.008		-0.008	***
Female (reference)	-						-					
Male	-		0.15	*	0.15	*	-		0.58	***	0.59	***
Married (reference)	-						-					
Cohabiting	-		0.10		0.09		-		0.17		0.18	
Single	-		-0.10		-0.10		-		-0.34	*	-0.32	+
Separated	-		-0.24		-0.24		-		-0.84	***	-0.87	***
Low education (reference)	-						-					
Medium education	-		0.08		0.12		-		0.28		0.36	*
High education	-		0.28	+	0.33	*	-		0.82	***	0.93	***
Enrolled in education	-		0.73	***	0.78	***	-		1.43	**	1.62	***
Employed (reference)	-						-					
Unemployed	-		-0.40	***	-0.41	***	-		0.009		0.01	
Low position on the social scale (reference)	-						-					
High position on the social scale	-		0.30	***	0.31	***	-		0.26	**	0.26	**
Country-level variables												
Change in youth un. rates (2006-2011)	-		-		0.02	*	-		-		0.01	*
Change in GDP per capita (2006-2011)	-		-		-0.01		-		-		-0.03	**
First cutpoint	-1.43	***	-1.04	***	-1.4	**	-0.10		0.12		0.66	
Second cutpoint	-0.64	***	-0.04		-0.38		1.77	***	2.48	***	3.02	***
Third cutpoint	1.66	***	2.55	***	2.21	***	3.85	***	4.69	***	5.21	***
Variance at the country level	0.16	***	0.12	***	0.06	***	0.15	***	0.11	***	0.01	
Y==1 (no child)	711	20%					1012	48%				
Y==2 (one child)	539	15%					770	37%				
Y==3 (two children)	1714	48%					268	13%				
Y==4 (three or more children)	592	17%					46	2%				
Leve-1 units	3556		3556		3556		2096		2096		2096	
Level-2 units	29		29		29		29		29		29	
Log-likelihood	-4421.0		-4006.3		-3911.7		-2208.1		-1850.1		-1808.1	

Note.

Models controlled for gender empowerment measure and involvement of preschool children in formal childcare at the country-level

Table 4 Estimates from the random intercept ordinal regression models on uncertainty about the stated lifetime fertility intentions. Beta coefficients. EB 2011

	Parity 0						Parity 1					
	Model I		Model II		Model III		Model I		Model II		Model III	
Individual-level variables												
Age-33 (average)	-		0.03	**	0.03	**	-		0.04	**	0.04	**
(Age-33)^2	-		0.00		0.00		-		0.00		0.00	
Female (reference)	-						-					
Male	-		0.009		-0.008		-		-0.22		-0.23	+
Married (reference)	-						-					
Cohabiting	-		0.12		0.13		-		0.02		0.04	
Single	-		0.59	***	0.59	***	-		0.23		0.32	
Separated	-		0.69	+	0.73	*	-		1.03	**	1.05	**
Low education (reference)	-						-					
Medium education	-		-0.19		-0.15		-		-0.14		-0.17	
High education	-		-0.19		-0.17		-		-0.26		-0.28	
Enrolled in education	-		-0.18		-0.15		-		0.07		0.20	
Employed (reference)	-						-					
Unemployed	-		0.04		0.04		-		-0.03		-0.07	
Low pos. on the social scale (reference)	-						-					
High pos. on the social scale	-		-0.17	*	-0.17	*	-		-0.23	+	-0.24	+
Intending 1 child (reference)												
Intending 2 children	-		0.008		0.03				0.33	*	0.36	*
Intending 3 or more children	-		0.26	*	0.28	*			0.58	*	0.59	*
Country-level variables												
Changes in youth unemp. rates					0.003						-0.002	
Changes in GDP per capita	-		-		-0.011		-		-		-0.004	
First cutpoint	-2.14	***	-2.19	***	1.77	*	-1.15	***	-1.50	***	-2.67	***
Second cutpoint	0.23	*	0.22		0.67		0.75	***	0.45	+	-0.70	
Third cutpoint	1.89	***	1.92	***	2.36	**	2.61	***	2.36	***	1.20	
Variance at the country level	0.28	***	0.27	***	0.19	***	0.11	***	0.12	***	0.06	*
Y==1 (very sure)	292	11%					247	24%				
Y==2 (fairly sure)	1129	44%					443	43%				
Y==3 (not very sure)	787	30%					264	26%				
Y==4 (not at all sure)	373	14%					75	7%				
Leve-1 units	2581		2581		2581		1029		1029		1029	
Level-two units	29		29		29		29		29		29	
Log-likelihood	-3159.7		-3123.4		-3067.1		-1276.6		-1258.8		-1234.9	

Note. Only people intending at least one child were asked to report the certainty about their intentions. Thus, the sample sizes in these models are lower than those of the models shown in Table 3. At the country-level models are also controlled for gender empowerment measure and preschool children in formal childcare.

Table 5 Estimates from the random intercept ordinal regression models on lifetime fertility intentions and uncertainty about lifetime fertility intentions. Beta coefficients on the perception of a worsening in the socioeconomic situation over the period 2006-2011.

	Lifetime fertility intentions		Uncertainty about fertility intentions	
	Parity 0	Parity 1	Parity 0	Parity 1
Individual perception of a worsening in any of the following conditions				
Cost of living in the country	-0.08	-0.12	0.04	0.02
Affordability of housing in the country	0.08	0.17	-0.002	0.09
Country economic situation	-0.14	-0.07	0.14	0.29 +
Country employment situation	0.10	-0.13	0.003	-0.09
Household financial situation	-0.15	-0.25 *	0.32 **	0.02
Personal job situation	-0.04	0.07	0.01	0.10
Country-means				
Cost of living in the country	-0.002	0.64	0.23	1.12
Affordability of housing in the country	-0.13	-0.78 +	-0.26	-0.92 *
Country economic situation	-0.84	-0.11	2.16	0.68
Country employment situation	2.36 *	1.79	-2.27	-1.20
Household financial situation	0.74	-2.63 +	-0.98	2.40 +
Personal job situation	-1.34	1.61	1.94	-1.51
First cutpoint	-0.34 ***	0.58	-1.74 +	-0.86
Second cutpoint	0.67 *	2.95 ***	0.67	1.09
Third cutpoint	3.25 ***	5.16 ***	2.37 *	2.99 ***
Variance at the country level	0.05 ***	0.06 **	0.22 ***	0.01
Level-one units	3556	2096	2581	1029
Level-two units	29	29	29	29
Log-likelihood	-3992.6	-1839.8	-3111.5	-1253.5

Note. Models controlled for all the individual-level variables considered in Table 3 and 4.

Table 6: Estimates from the random intercept ordinal regression models on lifetime fertility intentions and uncertainty about lifetime fertility intentions. Beta coefficients on the perception of a worsening in the socioeconomic situation over the period 2006-2011.

	Lifetime fertility intentions		Uncertainty about fertility intentions	
	Parity 0	Parity 1	Parity 0	Parity 1
Individual perception of a worsening in any of the following conditions				
Cost of living in the country	-0.08	-0.12	0.04	0.02
Affordability of housing in the country	0.08	0.17	-0.002	0.09
Country economic situation	-0.14	-0.07	0.14	0.29 +
Country employment situation	0.10	-0.13	0.003	-0.09
Household financial situation	-0.15	-0.25 *	0.32 **	0.02
Personal job situation	-0.04	0.07	0.01	0.10
Country-means				
Cost of living in the country	-0.002	0.64	0.23	1.12
Affordability of housing in the country	-0.13	-0.78 +	-0.26	-0.92 *
Country economic situation	-0.84	-0.11	2.16	0.68
Country employment situation	2.36 *	1.79	-2.27	-1.20
Household financial situation	0.74	-2.63 +	-0.98	2.40 +
Personal job situation	-1.34	1.61	1.94	-1.51
First cutpoint	-0.34 ***	0.58	-1.74 +	-0.86
Second cutpoint	0.67 *	2.95 ***	0.67	1.09
Third cutpoint	3.25 ***	5.16 ***	2.37 *	2.99 ***
Variance at the country level	0.05 ***	0.06 **	0.22 ***	0.01
Level-one units	3556	2096	2581	1029
Level-two units	29	29	29	29
Log-likelihood	-3992.6	-1839.8	-3111.5	-1253.5

Note. Models controlled for all the individual-level variables considered in Table 3 and 4.

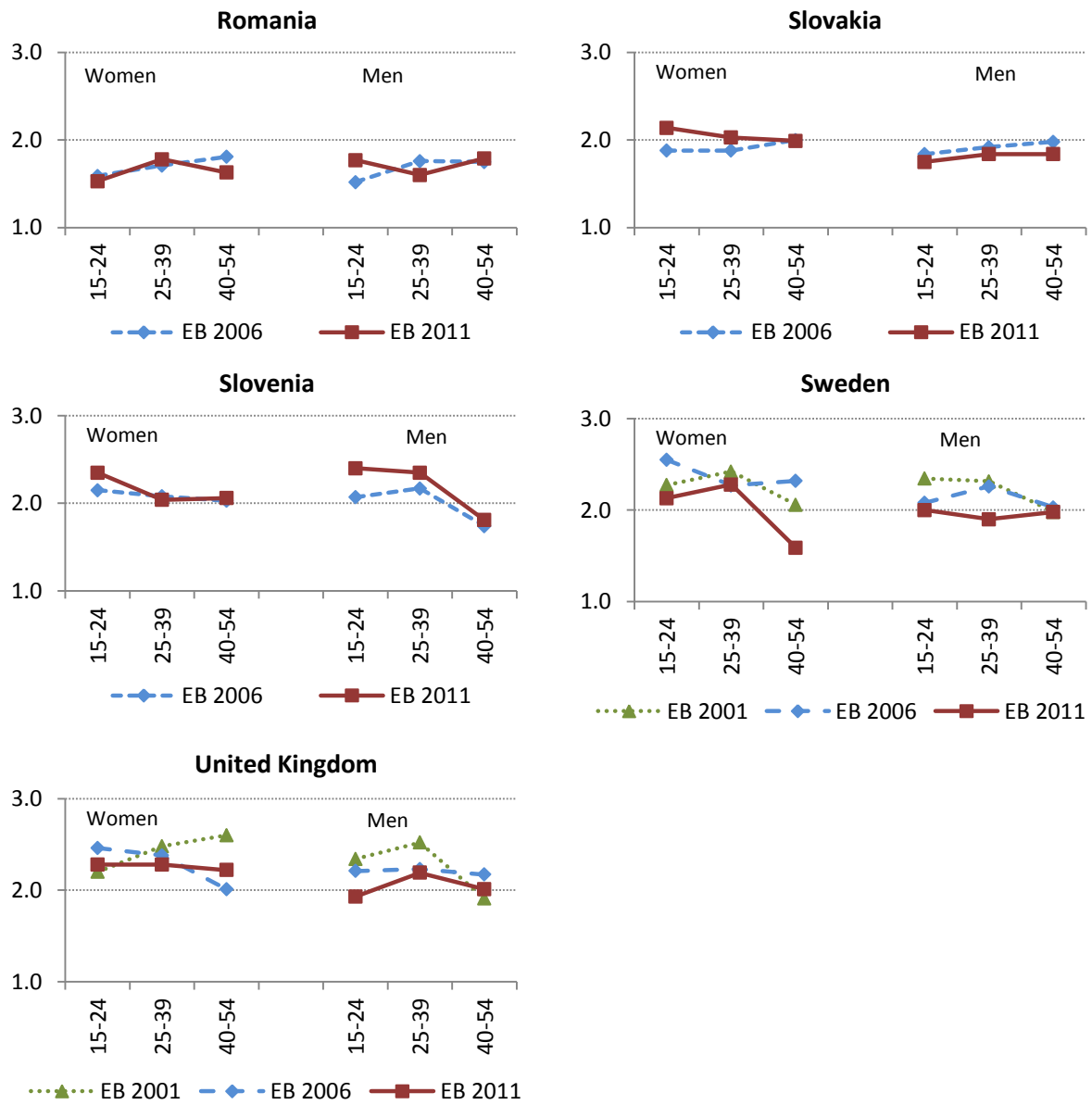**Figure A.1 Mean ultimately intended family sizes by age and sex. 27-EU countries. EB 2001, EB 2006, EB 2011**

Figure A.1 (Continued)

Austria

Belgium

Bulgaria

Cyprus

Czech Republic

Denmark

Estonia

Finland

Figure A.1 (Continued)

France

Women   Men

EB 2001   EB 2006   EB 2011

Germany

Women   Men

EB2001   EB 2006   EB 2011

Hungary

Women   Men

EB 2006   EB 2011

Lithuania

Women   Men

EB 2006   EB 2011

Luxembourg

Women   Men

EB 2001   EB 2006   EB 2011

Malta

Women   Men

EB 2006   EB 2011

Netherlands

Women   Men

EB 2001   EB 2006   EB 2011

Poland

Women   Men

EB 2006   EB 2011

Figure A.1 (Continued)

Romania

Women   Men

EB 2006   EB 2011

Slovakia

Women   Men

EB 2006   EB 2011

Slovenia

Women   Men

EB 2006   EB 2011

Sweden

Women   Men

EB 2001   EB 2006   EB 2011

United Kingdom

Women   Men

EB 2001   EB 2006   EB 2011

Figure A.2 Mean certain ultimately intended family sizes by age and sex. 27 EU countries. EB 2006 and EB 2011

Greece

Spain

Italy

Portugal

Ireland

Latvia

Figure A.2 (Continued)

Austria

Belgium

Bulgaria

Cyprus

Czech Republic

Denmark

Estonia

Finland

Figure A.2 (Continued)

France

Germany

Hungary

Lithuania

Luxembourg

Malta

Netherlands

Poland

Figure A.2 (Continued)

Romania

Slovakia

Slovenia

Sweden

United Kingdom
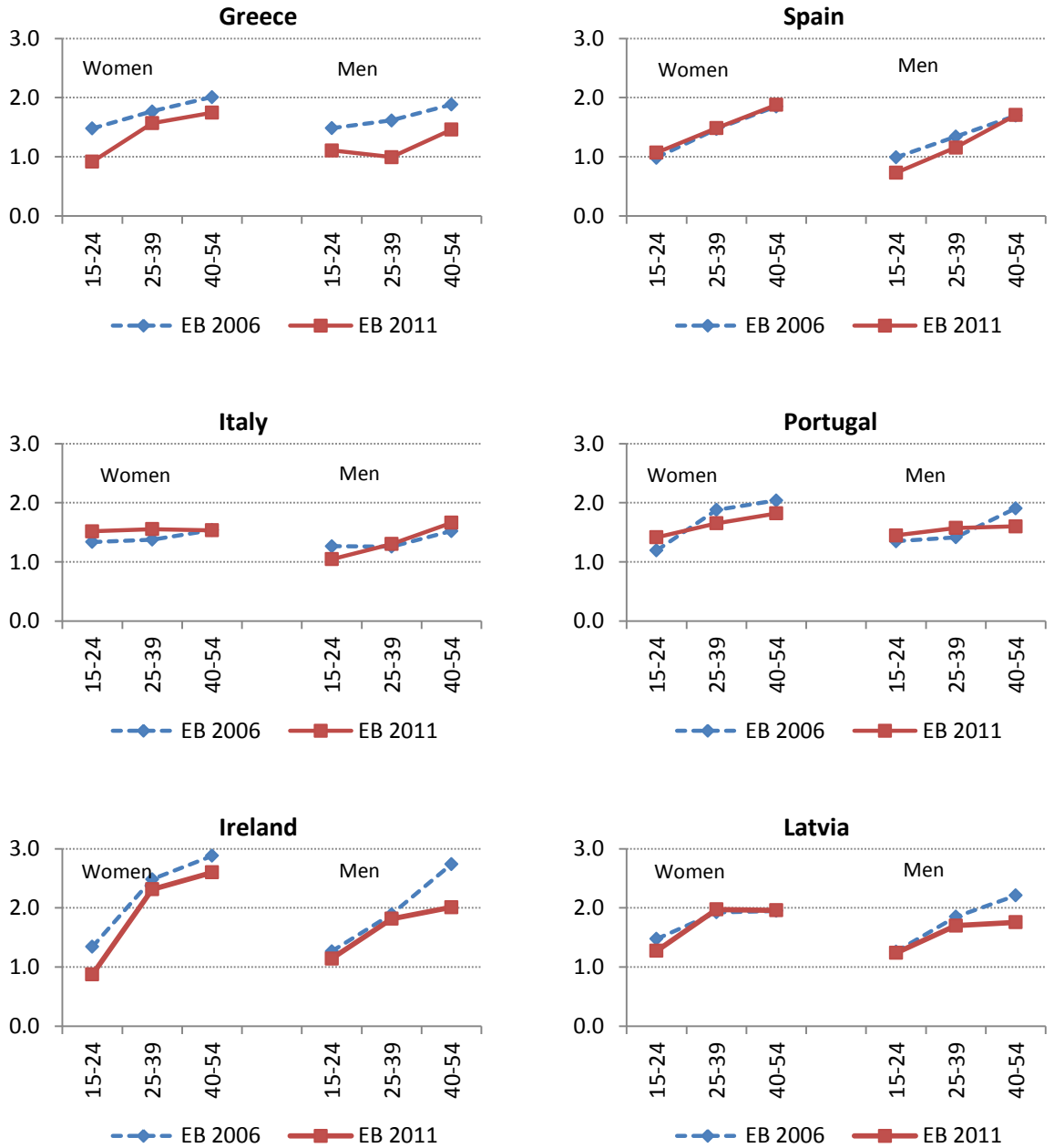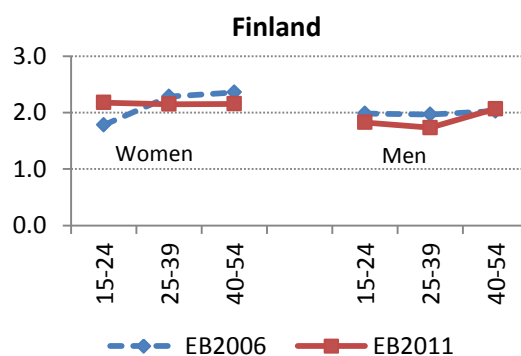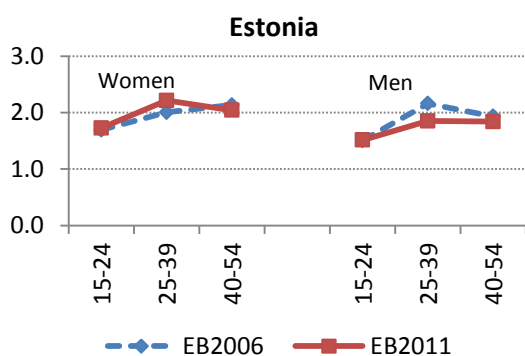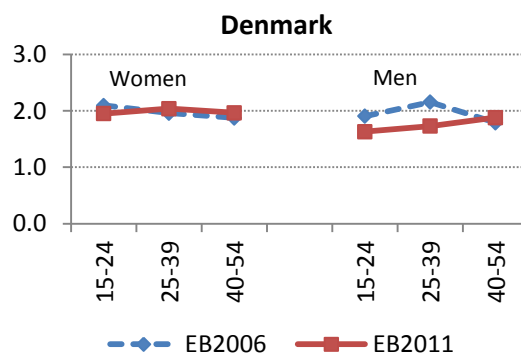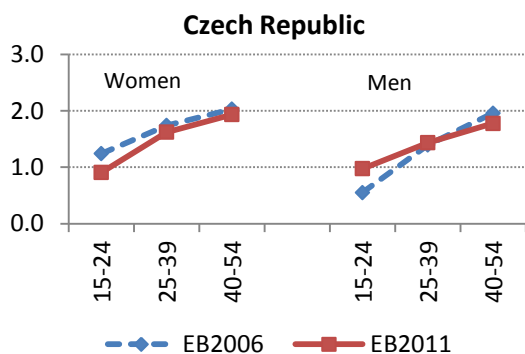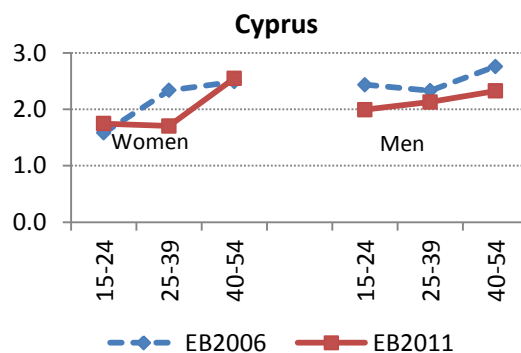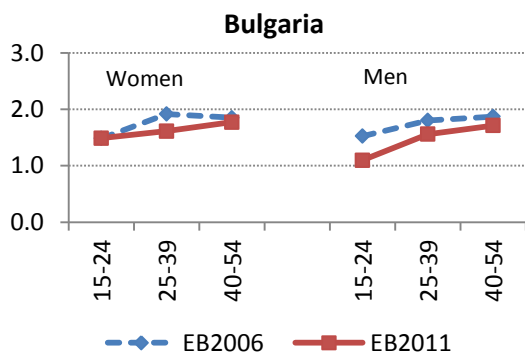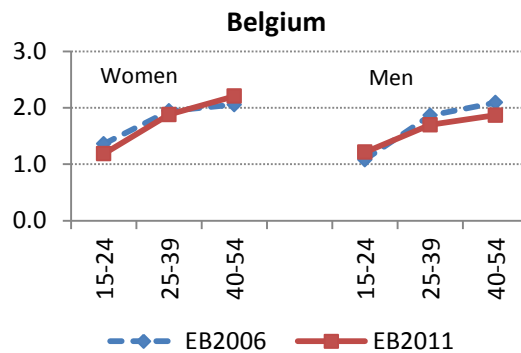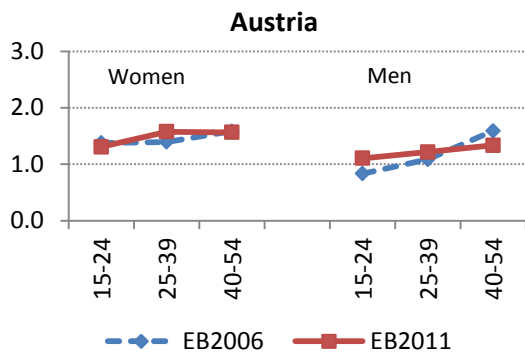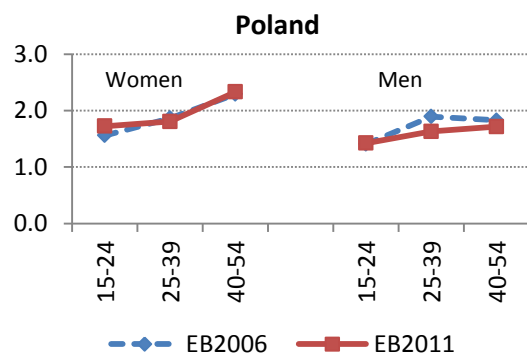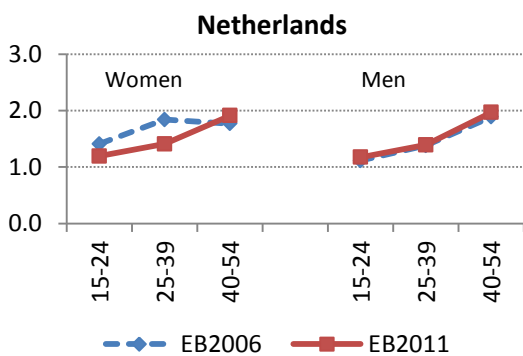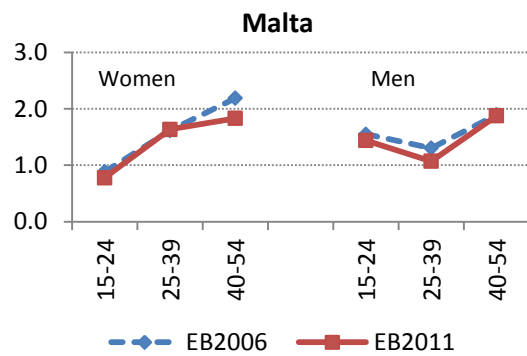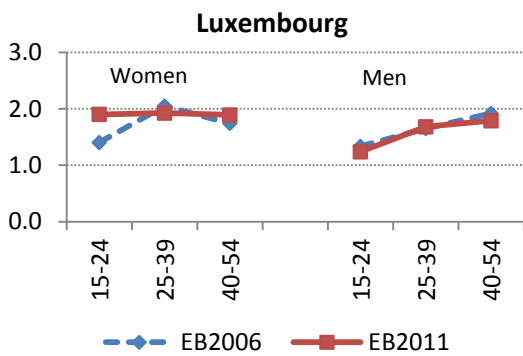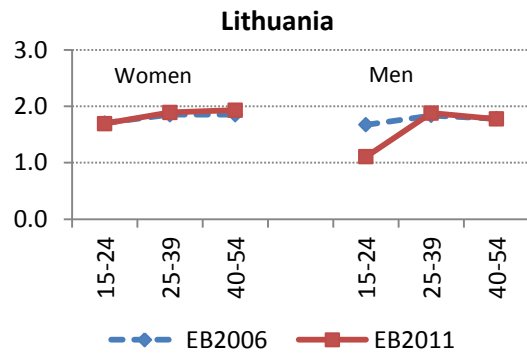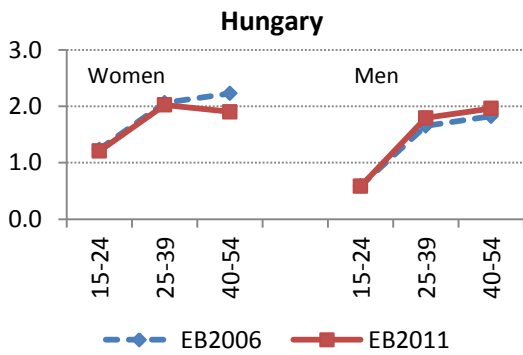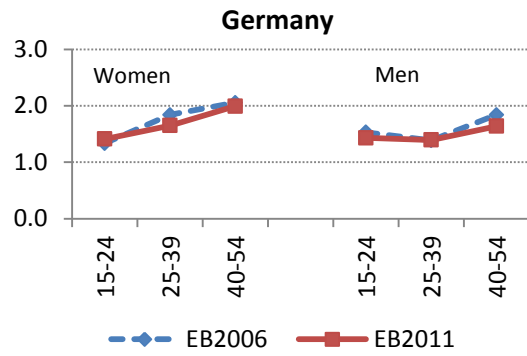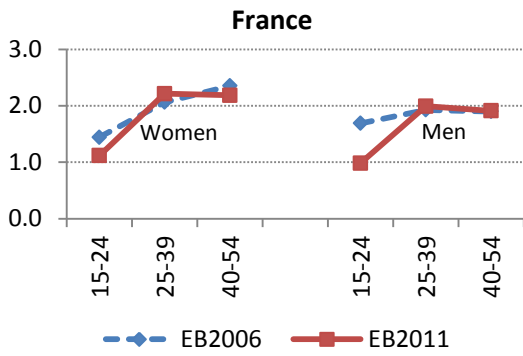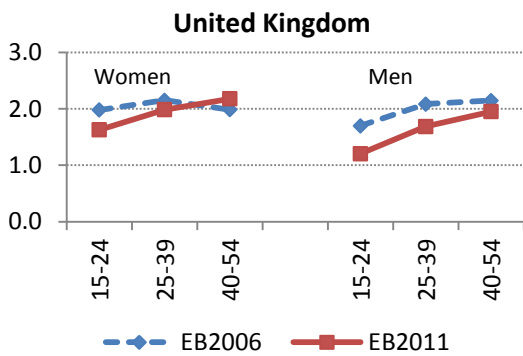
Table A1 Socioeconomic climate among Europeans of reproductive ages (20-45). 27 EU countries. EB 2011. Values in percent

Panel a) Perceiving a worsening in the following situations over the past five years*:

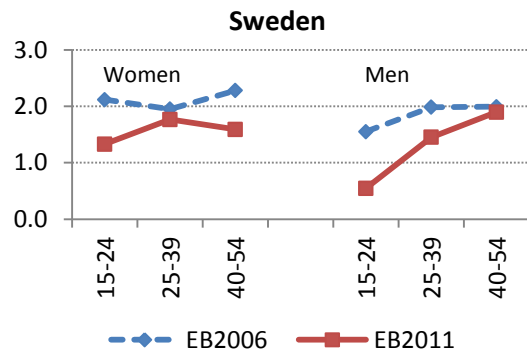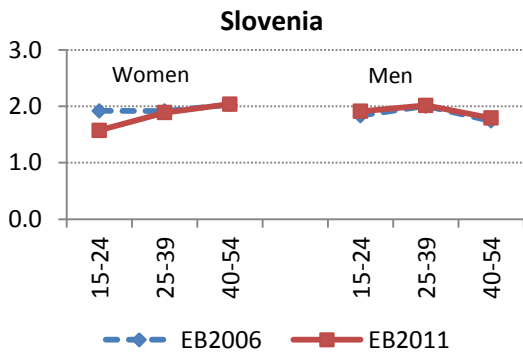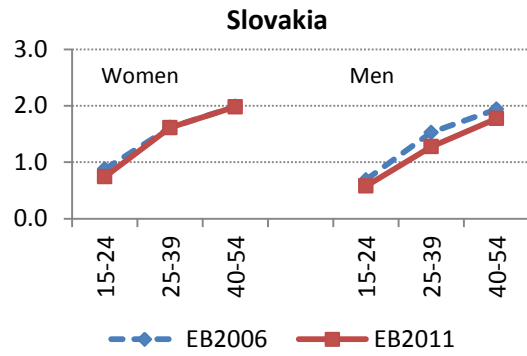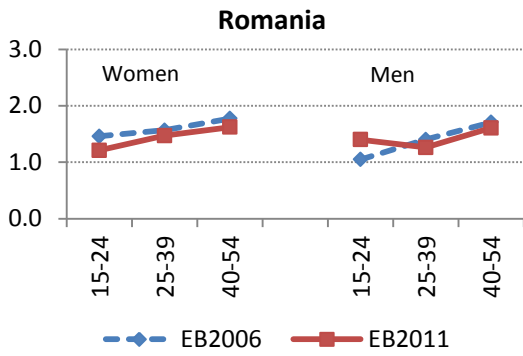|	Cost of living in the country	Affordability of housing in the country	Country economic situation	Country employment situation	Individual's job personal situation	Household's financial situation
Austria	62	53	43	39	13	22
Belgium	79	77	66	48	19	20
Bulgaria	83	60	82	80	35	52
Cyprus	90	90	86	87	22	49
Czech Rep.	85	45	82	68	25	39
Denmark	66	43	74	79	19	21
Estonia	90	37	66	72	23	30
Finland	79	79	60	49	11	11
France	91	84	84	73	19	24
Germany east	77	51	31	26	16	23
Germany west	76	40	28	23	12	20
Greece	96	77	98	96	57	72
Hungary	85	78	82	78	54	60
Ireland	81	41	92	91	38	51
Italy	65	57	69	68	28	29
Latvia	91	31	87	84	43	53
Lithuania	66	68	80	72	48	47
Luxembourg	74	82	54	54	7	12
Malta	88	75	63	45	19	32
Netherlands	82	70	82	61	22	22
Poland	73	69	49	46	24	34
Portugal	91	80	89	88	43	56
Romania	87	74	87	84	50	56
Slovakia	87	71	78	71	27	37
Slovenia	91	74	86	84	28	39
Spain	90	85	96	95	40	42
Sweden	54	61	28	38	12	12
U.Kingdom	85	74	83	72	27	32
min values	54	31	28	23	7	11
max values	96	90	98	96	57	72

*Note. Percentage of people answering 'worse' to the above mentioned items. Survey question was the following:
"*Compared with five years ago, would you say things have improved, gotten worse or stayed about the same when it comes to…?*" Response options were: "*Improved*", "*Got worse*", "*Stayed about the same*".

Table A1 (Continued):

Panel b) Expecting a worsening in the following situations in the next twelve months*:

	Cost of living in the country	Affordability of housing in the country	Country economic situation	Country employment situation	Individual's job personal situation	Household's financial situation
Austria	39	41	17	15	6	9
Belgium	49	46	26	16	7	8
Bulgaria	45	17	28	28	9	14
Cyprus	60	58	57	57	13	28
Czech Rep.	77	38	53	44	16	27
Denmark	37	27	15	10	3	3
Estonia	65	15	17	11	5	7
Finland	61	61	31	14	5	6
France	58	49	36	28	5	7
Germany east	63	30	21	23	7	15
Germany west	70	45	12	9	4	7
Greece	85	63	88	88	44	60
Hungary	63	55	44	44	27	35
Ireland	60	29	60	58	13	26
Italy	42	33	37	34	16	11
Latvia	60	14	30	21	7	12
Lithuania	24	35	23	18	13	13
Luxembourg	47	53	16	21	3	4
Malta	62	50	33	20	9	18
Netherlands	66	45	24	18	8	14
Poland	53	41	28	26	12	19
Portugal	77	69	73	69	29	39
Romania	54	43	50	48	24	30
Slovakia	71	52	47	36	16	21
Slovenia	68	47	54	48	12	21
Spain	54	44	42	35	10	11
Sweden	46	46	15	11	2	10
U.Kingdom	71	47	40	40	11	18
min values	24	14	12	9	2	3
max values	85	69	88	88	44	60

*Note. Percentage of people answering 'worse' to the above mentioned items. Survey question was the following: "*What are your expectations for the next twelve months: will the next twelve months be better, worse or the same, when it comes to...?*" Response option were*: "Better", "Worse", "Same".*

Table A1 (Continued):

Panel c) Perceiving as bad the following situations at the time of the survey*:

	Cost of living in the country	Affordability of housing in the country	Country economic situation	Country employment situation	Individual's job personal situation	Household's financial situation
Austria	38	42	21	27	12	17
Belgium	61	69	50	52	20	21
Bulgaria	92	61	92	93	41	57
Cyprus	82	95	72	82	23	40
Czech Rep.	82	55	86	82	21	37
Denmark	49	41	49	54	20	22
Estonia	90	39	57	75	16	25
Finland	69	79	41	40	13	11
France	89	87	78	84	21	29
Germany east	51	38	30	55	27	33
Germany west	54	40	16	34	17	23
Greece	96	88	100	98	54	60
Hungary	95	87	92	92	61	67
Ireland	88	62	95	96	38	40
Italy	75	76	79	80	33	27
Latvia	95	45	97	92	36	42
Lithuania	94	90	91	90	41	45
Luxembourg	67	87	12	28	10	8
Malta	93	84	67	61	20	34
Netherlands	43	58	33	29	14	17
Poland	85	85	69	76	32	33
Portugal	95	92	96	95	46	51
Romania	95	88	95	94	45	54
Slovakia	87	83	85	86	27	36
Slovenia	87	89	91	92	31	30
Spain	81	89	97	98	38	31
Sweden	26	43	11	36	12	9
U.Kingdom	71	76	81	79	27	26
min values	26	38	11	27	10	8
max values	96	95	100	98	61	67

*Note. Percentage of people assessing 'rather bad' or 'very bad' the above mentioned items. Survey question was phrased as follows: *"How would you judge the current situation in each of the following?"* Response options were: *"Very good"*, *"Rather good"*, *"Rather bad"*, and *"Very bad"*.