Job Instability and Fertility during the Economic Recession: European Countries

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Abstract

The trends of decline in TFR varied widely across EU countries. Exploiting individual data from the longitudinal EU-SILC dataset from 2005 to 2013, this study investigates the cross-country short-run effect of job instability on the couple's choice of having one (more) child. In order to account for the unobserved heterogeneity and potential presence of endogeneity, I estimate a Two Stage Least Square Model (2SLS) in first differences and under sequential moment restriction. Thus, grouping European countries into six different welfare regimes, I can estimate the heterogeneous effects of instability in the labour market on childbearing among different institutional settings of European welfare. The principal result is that the cross-country average effect of job instability on couples' fertility decisions is not statistical relevant because of the huge country-specific fixed effects, even if having a temporary job for women encourages chilbearing, in average. When I analyse these impacts distinguishing between welfare regimes, the institutional structure and linked social active policies reveal a varying family behaviour in fertility choices. In low-fertility countries, however, it is confirmed that the impact of parents' successful labour market integration might be ambiguous and it might due to the scarcity of child care options and/or cultural norms.

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1 Introduction

Over the last five decades, in all but a few European countries total fertility rates (TFR)[1] have decreased and have reached sub-replacement levels. Demographic scholarship based on the key idea of a *Second Demographic Transition* (Van de Kaa 1987; Lesthaege and Willems 1999) explains that the fertility decline started early after the middle of the 1960s at the end of post-war baby boom in Western, Northern, and Southern Europe while that of Central and Eastern European countries has arisen since the period after 1989.

The trends of TFR flexure have varied widely across countries: in fact, in Northern European countries, the decline has oscillated around 1.85 children per women since the mid-1970s, while, by contrast, among Eastern and Southern European countries it has been slower but arrived at the lowest level of 1.3 in 1994 before gradually starting to edge up. The latters are known as 'lowest-low-fertility' countries because they have TFRs persistently around 1.3 children per woman (Kohler et al. 2002).

Demographic trends of declining fertility rates jointed to increasing life expectancy in most developed countries involve the consequent ageing populations have led to a reduction in the number of women of childbearing ages, the restricted growth of the potential labour force, and thus the growing number of retirees will lead to higher public (and private) spending on pensions and longterm care supports for the retired population (OECD 2011).

Recent research suggests that fertility diversities between European countries cannot fully be explained by the only process of postponement. Structural and cultural changes influenced by economic development are likely to affect fertility decisions not only in terms of timing, but also in terms of quantum (Kohler et al. 2002). Bratti and Tatsiramos (2012) find that two opposite forces cohabit with different magnitudes due to European countries' institutional features and determine the overall sign of *tempo effect*: the first one consists of biological and sociocultural factors and produces a postponement effect, while the second one based on career-related factors leads to a catch-up effect. In particular, they show that the postponement effect is larger in Southern European countries, where a traditional role of women prevails and where there are generally difficulties to reconcile family and work, while a catch-up effect is sizeable in countries where institutions, such as child-care and part-time jobs availability, longer maternal leaves and higher wages, facilitate mothers to participate in the

[1] The definition given by OECD regarding total fertility rate is: in a specific year, as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates. It is calculated by totalling the age-specific fertility rates as defined over five-year intervals. Assuming no net migration and unchanged mortality, a total fertility rate of 2.1 children per woman ensures a broadly stable population. Together with mortality and migration, fertility is an element of population growth, reflecting both the causes and effects of economic and social developments. The reasons for the dramatic decline in birth rates during the past few decades include postponed family formation and child-bearing and a decrease in desired family sizes. This indicator is measured in children per woman". *OECD (2016), Fertility rates (indicator). doi: 10.1787/8272fb01-en*

labour market.

It is still debatable whether or not the macro-level evidence of a positive link between fertility and female employment reflects differences in individual behaviour:[2] in fact, earlier theorical studies looked at completed fertility in relation to employment and they do not have reason why the income effect should prevail over the substitution effect (Willis 1973; Becker 1981).[3] Matysiak and Vignoli (2008) performe, throught a meta-analysis, a systematic review of more recent studies that analyze the effects of female employment on fertility and they confirm high variations in the effect among institutional settings and a significant reduction in the conflict between work and family life over time in countries with re-increasing fertility.

Furthermore, Mills and Blossfeld (2005) claim that, during the 1990s, childbearing has been further disincentivized by employers' rising demands for workers flexibility due to the increasing competition in the labour markets. The employment instability and job precariousness increase employment uncertainty and for young workers the difficulties of their transition to adulthood become more intense: in fact, in their early labour market careers they try to strengthen their economic position and then they begin to plan family decisions (e.g. McDonald 2006).[4]

Using individual data from the longitudinal European Survey of Income and Living Conditions (EU-SILC) from 2005 to 2013, this study investigates the cross-country short-run effect of job instability on the couple's choice of having one (more) child and then, under a comparative perspective, it examines in depth the heterogeneous effects of instability in the labour market on childbearing among different institutional settings of European welfare regimes.

In the recent literature Adserà and Menendez (2011) find that high aggregate unemployment may increase individual unemployment incidence, the risk of losing a job in the forthcoming future, and at the same time decline the likelihood of future wage growth. Del Bono et al. (2015) show that job displacement (and not mere unemployed status) has a negative effect on fertility choices in Austria.[5]

[2] Since the mid-1980s the cross-country association between female labour force participation (FLFP) and fertility (TFR) has become positive (Ahn and Mira 2002; Engelhardt and Prskawetz 2004; Billari and Kolher 2004), although a meta-analysis of micro level studies (Matysiak and Vignoli 2008) indicates that the relationship between FLFP and fertility remains negative, but the size of the association is stronger where the male-breadwinner model prevails (e.g. Southern Europe), and weaker in the Nordic Countries where institutions have implemented more generous protection systems to reconcile motherhood with work (Esping-Andersen 1999; Adserà 2004; Del Boca and Sauer 2009).

[3] Pioneering studies using micro data to examine jointly birth decisions and employment decisions are, for example, Hotz and Miller (1988), Moffitt (1984) and Butz and Ward (1979), which illustrate that the fertility-employment relationship changes over time and differs across countries, depending on preferences, labour market situations and institutions.

[4] See McDonald (2002) for an overview of the two main alternative theories of the *risk aversion theory* and of the *uncertainty reduction hypothesis* (Friedman et al.1994) under economic uncertainty.

[5] See also Sobotka et al.(2011) for a recent review on the effects of economic recession on fertility.

The contribution of this paper to the existing literature is threefold. Firstly, I build job (in)stability measure for both the partners by their own status of participation at the labour market (that encompasses holding temporary or permanent contract, and being dismessed or unemployed), focusing specifically on childbirth of the active in the labour market couples across European countries. Secondly, I account for the unobserved effects, such as unobserved heterogeneity, feedback effects, and the possible presence of endogeneity due to reverse causality (Browning 1992). It may be that employed women with a short-term contracts may have disparate observed and unobserved characteristics, such as preference for children, individual abilities, and diversity in fecundity. Furthermore, there may be feedback effects, i.e. shocks in the fertility affecting the future dynamics in the labour market. In addition, women with strong preferences for children (and with highest marginal utility of children) could decrease their own levels of education and their labour market attachment, and may choose stable job, but with lower earning profiles (Francesconi 2002). In order to account for the unobserved heterogeneity and potential presence of endogeneity, I estimate a Two Stage Least Square Model in first differences and, under sequential moment restriction, I use the first-order lag of my variable of interest as instrument to test to possible presence of endogeneity problem (Wooldridge 2010; Picchio and van Ours 2016).

Only a few empirical studies have dealt with this issue. Modena and Sabatini (2012) use as instrument of job precariousness the share of precarious workers over the labour force in the Italian region of residence; the same one is by Auer et al. (2013) but they add an specification of industry levels. Finally, also Del Bono et al. (2015) use as instrument for unemployment the interaction between firm closure and dummies for years, quarters, regions and industries.[6]

Thirdly, this paper contributes to the existing literature providing new results on fertility choices analyzing the phenomenon in a comparative framework. Following the aggregation suggested by Esping-Andersen (1990) modified by Boeri and Perrotti (2002), I group countries in Continental (Austria, Belgium, France and Luxembourg), Southern European (Spain, Italy, and Greece) Eastern (Czech Republic, Poland, Bulgaria and Hungary) Baltic (Estonia, Latvia and Lithuania), Nordic (Norwey Finland, Denmark and Iceland) and Anglo-Saxon (United Kingdom, Cyprus) countries. So, I can estimate the heterogeneous effects of instability in the labour market on childbearing among different institutional settings of European welfare regimes.

The principal result is that the cross-country average effect of job instability on couple's fertility decisions is not statistical relevant because of the huge country-specific fixed effects. Only when I analyze these impacts, distinguishing

[6]This literature documents other attempts to identify the correlations of labour market institutions that increase instability—such as temporary contracts, part-time work, flexible jobs, or job displacement—have been rather isolated (De la Rica and Iza 2005; Gonzalez and Jurado-Guerrero 2006; Adserà 2011, Modena and Sabatini 2012; Vignoli et al. 2012; Del Bono et al. 2012, 2015). See also Kohler and Kohler (2002), Ranjan (1999), Kreyenfeld (2010), Schimitt (2012) for studies trying to associate the fertility decline with general economic uncertainty, while Fiori et al. (2013) and Modena et al. (2014) analyze economic insecurity effect on the fertility intentions in Italy.

between six different welfare regimes, the institutional structure, linked social active policies, and cultural norms reveal varying family behaviour about fertility choices

The remaining structure of this paper is organized as follows: in section 2, I review the relationship between labour market outcomes and fertility, focusing on the job instability; in section 3, I describe the sample selection process and the data; in section 4, I explain the methodology; the main results and heterogeneous effects are presented in section 5; the paper closes in section 6 with a conclusions and brief discussion on policy implications of the analysis.

2 Labor Market Outcome and Fertility in Europe

2.1 Literature review

In the New Home Economic theory, decreasing fertility levels have been explained as an overall result of the increasing level of education among women, which is strengthening their labour market attachment and career aspirations. In the absence of possibilities for combining work and family life and the presence of a strong division in gender roles, for women increasing career and income options lead to the fact that women tend to replace work with childbearing (substitution effect). By contrast, for their male partners increasing career and income options favour fertility decisions (income effect) (Becker 1991).

Increases in possibilities of combining work and family life, which are often accompanied by weakening normative gender roles, may result that for women income effect dominates the substitution effect (McDonald 2000). In those countries where parents can successfully combine work and family life, women's labour market participation is likely to facilitate the decision to start or 'enlarge' a family: the negative substitution effect of female employment on fertility gets weaker while the positive income effect of female employment on fertility gets stronger. The successful integration of both partners and the presence of a dual-earners model can increase household income, tackle better the 'new' social risks of economic uncertainty born in the 1990s by the increasing competition in the labour markets and employers' rising demands for workers flexibility and then they may affect family formation as well as fertility choices (Esping-Andersen 1999).

As this ability also depends on a country's degree of support for combining work and family, the relation between female employment and fertility might differ across countries. In low-fertility countries, however, the impact of parents' successful labour market integration might be ambiguous, due to the scarcity of child care options and/or cultural norms (Matysiak and Vignoli 2008): e.g., a childbirth might deal to a family income loss in the case of at least one of parents decide to replace his/her former job with childcare. Consequently, couples with both partners active in the labour market might be more likely to decide against childbirth as compared to couples with one partner already

inactive. Hence, regarding the impact of women's activity status on childbirth, various side effects come into play. These may be institutional or individual (like education and individual income options), or they may relate to the levels of family income before and after childbirth.

Recently, literature which relates labour market conditions to fertility has started to study the idea of labour market "instability" as a significant determinant of the recent trends in fertility rates observed in many European countries. Ahn and Mira (2001) show negative correlations between choices of fertility and males' past unemployment and temporary contracts in Spain. De La Rica and Iza (2005) show that Spanish women holding fixed-term contracts and lacking stable employment prospects delay entry into motherhood compared to female workers holding open-ended contracts. Adserà (2005) using cross-country variation of labour market institutions in OECD nations documents that there is a reduced fertility in countries that have experienced grave unemployment.

Santarelli (2011) focuses on the transition to the first child for European married couples over the period 1994-2001 and finds that single-earner couples have their first child earlier than dual earner couples, but the type of contract does not seem to matter much. She also tests the impact of couple's income on first birth risks, but without controlling for the couple's employment instability.

Modena and Sabatini (2012) find that in Italy having a precarious job is a deterrent to planning parenthood rather than a persuasive factor to childbearing through a decrease in the opportunity cost for women.

Del Bono et al. (2012) show that an unexpected career interruption reduces significally the number of children for women in Austria, especially in the case of women in white collar occupations.

Finally, Greulich et al.(2016) find that, on average within European countries, women in stable employment have a significantly higher probability of second childbirth than inactive or unemployed women. Furthermore, they present heterogeneous results across the countries, in fact, while female employment generally favours a transition to second childbirth in high-fertility countries, the impact is ambiguous in low-fertility countries.

2.2 The EU stylized facts

Currently, all countries in Europe have TFR rates below replacement level (Eurostat 2011). The situation was particularly acute at the turn of the century in Southern, Central and Eastern Europe where TFR rates were at or below 1.3 (Billari and Kohler 2004). Since 2000, period fertility in most of these low and lowest-low fertility countries has been steadily rising but, currently, over 50% of the EU-27 countries having TFR rates at or below 1.5. The average of TFR in Europe (EU-27) stands at 1.57 (Eurostat 2011): Eastern, Southern and German-speaking European countries tend to have the lower TFRs than Western and Northern European countries' ones. In fact, in 2011 the TFRs record 1.36 in Germany, 1.30 in Poland and 1.36 in Spain and all have low TFRs (Eurostat 2011). Conversely, countries such as Denmark (1.87), France (2.03), Sweden (1.9) and the UK (1.98) have all increased their TFR in the last

decade (Eurostat 2011).[7] This heterogeneity is important to suggest propery polices designed to raise fertility in Europe.

During the past three decades, in some European countries labour market institutions have aimed at women in order to conciliate career and family, causing a switch in the sign of the relationship between labour market outcomes and fertility at the macro level. Thus, the correlation between female participation in the labour force and fertility turned positive at the end of the 1980s across OECD countries (Ahn and Mira, 2002; Billari and Kohler, 2004; Engelhardt and Prskawetz, 2004). Scholarship explains it as an outcome of the increases in availability of childcare services and part-time jobs, especially in Nordic countries (Del Boca and Locatelli 2006; Del Boca et al. 2009).

With regard to labour market, the Eurostat data show that the average female activity rate of the 15–64 years age group in EU28 increased steadily from 63.6% in 2008 to 66% in 2013. Conversely, in the same period, the male activity rate was higher and roughly stable at around 78%. However, the EU average combines a high degree of heterogeneity across countries. In general, comparison of activity rates in 2008 and 2013 shows that the male activity rate declined. On the one hand, this downfall was recorded especially large in Ireland (-3.8%), Denmark (-3.7%), Portugal (-2.7%), Norway (-2.5%), and Iceland (-2.1%), while, on the other hand, it exhibited a positive variation in Central and East European countries. Conversely, the female activity rate increased substantially in almost all countries except for a few countries with the highest FLFP rates, such as Denmark and Norway respectively by -1.4% and -1.2%. The upturns were recorded at 2.4% in EU28 and more than 3 percentage points by Hungary, Lithuania, Czech Republic, Luxembourg, Malta, Poland, and Spain.

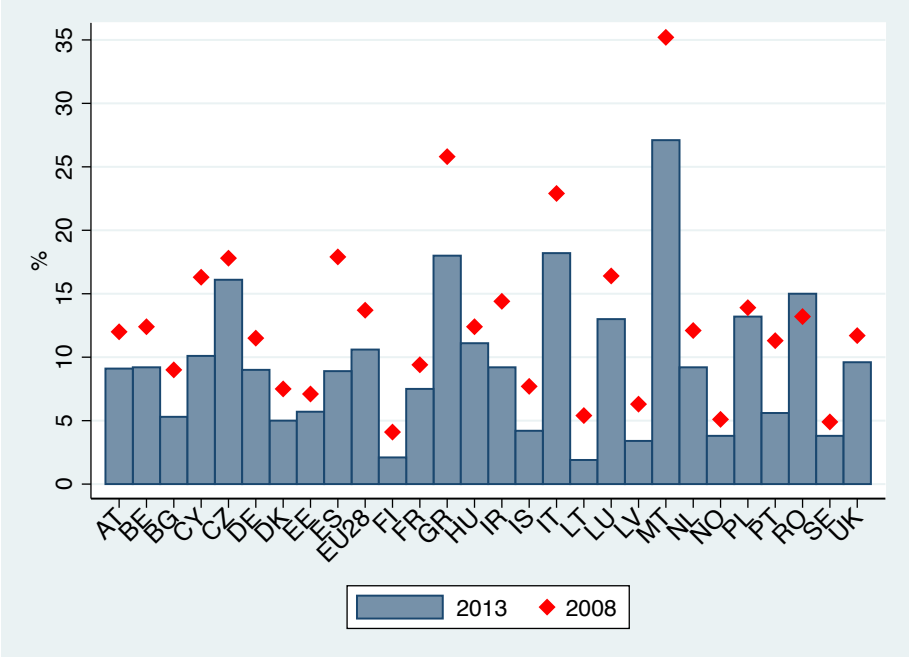
These results disclose significant cross-country differences in FLFP rates. While the EU average rate for women stood at almost 66% in 2013, rates were particularly low in Italy, Malta and Romania, oscillating between 50.2% and 56.3%. Conversely, Northern countries such as Denmark, the Netherlands and Sweden had particularly high female participation rates in the labour market, exceeding the 74%. The cross-country variation in male activity rates is smaller: in 2013, the EU average is 77.9% and the country specific rates are just above 70% at the lower end in Hungary, Belgium, Bulgaria and Italy, while between 80% and 85% at the higher end in Germany, the Netherlands, Denmark, and Sweden.

The gender gap in participation rates in labour market decreased between 2008 and 2013 in all countries except Romania. Nevertheless, the EU average gender gap stood at 10.6 percentage points in 2013. The gender gap persisted at particularly high rates, ranking from 18 percentage points and 28 percentage points in Greece, Italy, Malta and Romania, while in Finland, Lithuania and Sweden, it fell below 5 percentage points (Figure 1).

Since the quality of participation in the labour market is as important as the quantity of participation, Eurostat data show that women are overrepresented in temporary and part-time jobs in EU with respect to men: during the years 2008-

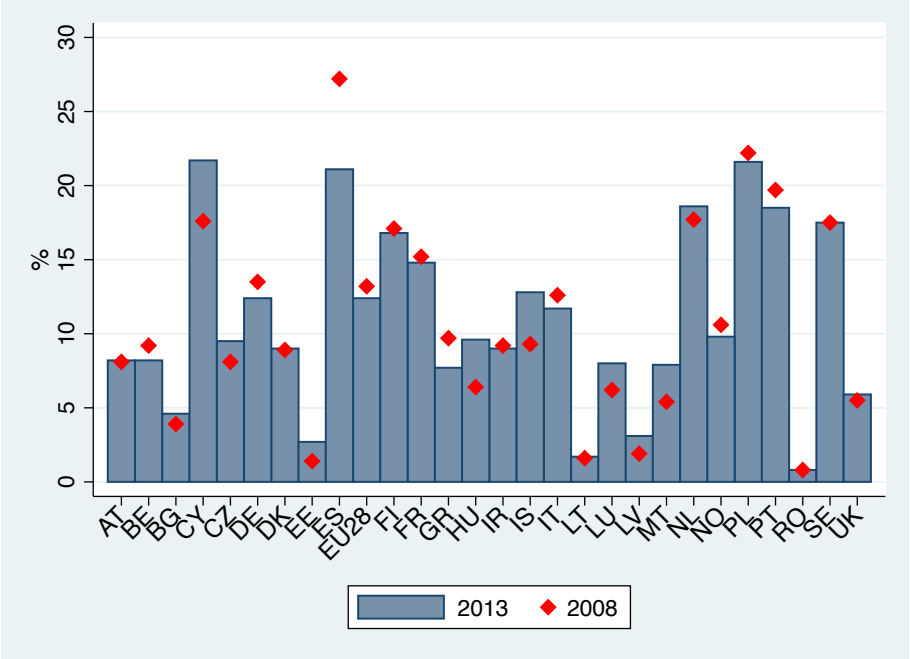
[7] See Figure 4 in the Appendix.

Figure 1: Gender gap in activity rates, EU countries, 2008-2013



Source: Own elaboration from Eurostat, Labour Force Survey data

Figure 2: Female temporary employees on total employment, EU countries, 2008-2013



Source: Own elaboration from Eurostat, Labour Force Survey data

2013, the evolution of the EU share of temporary workers in total employment for women has been always higher than men's one, passing respectively from 15% and 13.3% in 2008 to 14.2% and 13.2%. The decline affected women more than men, so, in average, there was no significant change in the share of temporary workers among men over the 2008–2013 period, while the share declined by almost 0.8 percentage points in the women's case.

The Figure 2 shows female temporary employees on the total employment (15-64 years age group) across EU countries in 2008 and 2013 in order to make it clear the country-specific adoptions of these flexible forms of job, at least for women.[8] This share was particularly low in Latvia, Lithuania and Romania, all below 3%. Cyprus, the Netherlands, Poland and Spain had the highest shares of temporary employment among women, and in Poland for example the share reaches at 21.6%.

Finally, in general, workers with temporary contracts face an higher risk of unemployment than those on standard contracts. Thus, I sum up a cross-country institutional framework to access to social protection for temporary workers, focusing on unemployment benefits.[9] In all countries ecxept for Czech

[8] Eurostat data show that cross-country variation in the share of male temporary workers tends to exhibit similar trends.

[9] Income support for the unemployed can take one of two forms. Firstly, those out of

Republic and Poland,[10] being in a temporary rather than a permanent job does not present a difference to formal entitlement to unemployment benefits, but in practice workers in temporary jobs could be less likely to be eligible for unemployment insurance benefits because of their inadequacy of contributions.

Eurofound (2013) documents that, even if they do qualify, they might receive a lower amount because the benefit is related to duration in employment or to total earnings over a specified period of time and it could be happened that they might be ineligible for benefit because they have earned less than a minimum amount or worked too few hours. Thus, in a general thought, the shorter is the time for which contributions must be paid to qualify for unemployment insurance benefits, the more likely it is that young people in temporary jobs will be able to access them. In the Netherlands, Ireland, Latvia and Poland employees with temporary contracts are likely to find more difficult to meet qualifying conditions for unemployment benefits than those in France, Spain and Greece.[11]

In the European countries the maximum duration of benefits varies in line with how long the contributions have been paid and, in a number of countries, with age, again potentially disadvantaging those on temporary contracts except for Denmark, Sweden, the UK, Cyprus, and the Czech Republic. Finally, in Greece, Spain, France, Austria and Portugal, young workers in temporary jobs may, in practice, have more limited access to unemployment assistance, as well as insurance benefits, than those on standard contracts of employment due to eligibility for unemployment assistance requires previous receipt of unemployment insurance benefit.

work known as unemployment insurance benefits are typically contributory, financed through earnings-related social contributions levied on employers and employees. In this case the eligibility depends on having a sufficient contributions record based on proof that the person concerned has been employed, and paid contributions, for a minimum period of time. While the amount payable is in most cases earnings-related but can also be flat rate, or may include both a fixed and earnings-related component. All the European countries covered here have unemployment insurance schemes, although the eligibility conditions and the amount of benefit payable vary greatly. Secondly, if the workers are not eligible for unemployment benefits or if they have exhausted their entitlement, the unemployed might be able to receive unemployment assistance, which is non-contributory and mostly financed through general taxation.This is generally less generous than unemployment benefit and often means-tested, assessed at the household rather than individual level so that young people living with their parents are not eligible. The amount received can be a flat-rate, or designed to bring a household's income up to a minimum level, or a combination of both (Eurofound 2013).

[10] Eurofound (2013, p.20) states: "In the Czech Republic, those on a type of temporary contract known as an 'agreement on work performance' are not eligible for unemployment benefits if their wage is below CZK 10,000 (around € 390) a month, because they do not pay social contributions. In Poland, on the other hand, people working on civil law contracts are not entitled to unemployment benefit at all unless they are employed on a 'contract of mandate'. There are other ways in which young people in temporary jobs are disadvantaged if they become unemployed. In the UK, for instance, those under 18 are not eligible for any kind of unemployment insurance benefit, irrespective of the type of employment contract they have. In Italy, Ireland and the UK, younger workers' benefit rates are lower than those for older workers."

[11] See Figure 5 Qualifying period for unemployment benefits - EU countries for a detailed summary of the eligibility criteria for these benefits in Appendix.

3 Data

For the analysis I use the longitudinal data of the EU-SILC (European Statistics on Income and Living Condition), across the years 2005-2013. This survey was created in 2003 to replace the European Community Household Panel (ECHP) and now includes thirty-one European countries. It captures individual and household situations by using a large number of economic and social variables that may be considered determinants in deciding to have children.[12] Grouping together harmonized survey data for a large set of countries allows us to obtain large sample sizes; each wave is representative of the whole European population and it drawns a sample of 102,700 households and of 1,211,300 respondents that will be followed for four years using a rotational design in which the 25% of sample changes every year.

I start to build the whole dataset combining all waves of each country (each one of four years)[13] of the longitudinal dataset from 2005 to 2013, and I delete the repetitions of the respondents appearing simultaneously in two or more waves. I am left with an unbalanced panel of 992,094 individuals for a total of 3,943,327 records. In this analisys, I have choosen to start at 2005 because EU-SILC was expanded in 2005 to cover all of the EU25 Member States together with Norway and Iceland.[14] To improve interpretation of results I group countries according to their welfare system. First, I follow the seminal work on the taxonomy of socio-economic systems developed by Esping-Andersen (1990)[15] because several studies covering a wide range of subjects (such as welfare, labour market, innovation and healthcare) seem to confirm the original taxonomy and it is in line with my research purpose to focus on classification based on job flexibility and the diffusion of unemployment benefit which might affect the decisions to leave the parental home and family formation. Thus, I adjust the classification including Greece among the Mediterranean countries (Boeri and Perrotti 2002) and I enlarge it inserting the new group of Eastern countries following the aggregation suggested by the European Commission (2006).[16] Finally, I choose to separate the Baltic countries from the Eastern countries be-

[12] All of these informations are rarely available in other surveys; some exceptions are the European Labour Force survey that contains information on work, but not on income, while other surveys that include both demographic and economic variables have a national focus and run in only one given country (e.g. the German Socioeconomic Panel, the American Panel Study of Income Dynamics, or the Italian Survey on Household Income and Wealth).

[13] In a few countries (France, Lithuania, Luxembourg, Norway, Portugal and Slovakia), some individuals are observed for more than four years.

[14] The 27 countries are: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, the Netherlands, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia, UK and Romania. Longitudinal data is not available for Germany and Switzerland.

[15] The author classified the welfare systems of developed economies into three models: Liberal, Conservative and Social Democratic.

[16] Moreover, this classification has been largely confirmed by the findings of Eurofound (2016) about the different dynamics among the EU member states in young people's transition to adulthood. See Offe and Fuchs (2007) to follow up on welfare state formation in the enlarged European Union after the entry of the Post-Communist new member States.

cause, with regard to family formation, these countries show different pattern as compared to Easter ones, while they move closer to Continental countries with 50% of young people leave parental home in line with the EU average (Eurofound, 2016). Thus, I select 21 countries which reflect the peculiarities of these six welfare regimes: Continental welfare regime which provide benefits targeted to individuals who belong to specific categories, such as families or a specific type of worker (Austria, Belgium, France, and Luxembourg). Southern regime (Spain, Italy, Greece, and Portugal) where welfare coverage is often residual and left to the family, with limited social benefits (Ferrera 2005), Nordic one (Norway Finland, Denmark, and Iceland), Anglo-Saxon or Liberal one (United Kingdom, and Cyprus), Eastern one (Czech Republic, Poland, Bulgaria, and Hungary) and finally Baltic one (Estonia, Latvia, and Lithuania).

Furthermore, I match all the women with their own partners (co-living) and with their own children. In order to investigate the short-run effect of job instability on the couple's choice of having at least an another child, I draw all women of childbearing age between 15 and 45 years old, living with the partner, and who are active in the labour market. I am left with a panel of 155,371 individuals and 391,437 observations in which I can control jointly for the both partners' socio-economic characteristics to avoid an overestimation of the negative effects of women's employment outcomes on fertility (Matysiak and Vignoli 2008).

Thus, I build job instability measure for both partners by the lag of the participation status at the labour market: in this case, for each year there are three different economic statuses (unemployed, temporary employee,[17] and permanent employee). Thus, I have to follow the units at least over three subsequent years due to the lack of the synchronicity that occurs between the getting pregnant and the childbirth and, hence, the other lagged socio-economic covariates. As I include women who were first interviewed between 2005 and 2010 and re-interviewed at least three subsequent years, the sample becomes of 15,091 individuals and 20,000 records. In the last one 2,886 women have had a childbirth during the previous year and for physiological reasons they could not have another one in the period of analysis. So, I decide dropping out them to avoid underestimating of the probability to have at least a child. Finally, the sample consists of 12,205 couples and 17,114 observations across the countries, as follows in Table 1.[18]

[17] Eurostat, EU-SILC Description of Target Variables: "In the case of a work contract of limited duration the condition for its termination is generally mentioned in the contract. To be included in these groups are: person with a seasonal job, person engaged by an employment agency or business and hired out to a third party for the carrying out of a 'work mission' (unless there is a work contract of unlimited duration with the employment agency or business), person with specific training contracts but if there exists no objective criterion for the termination of a job or work contract these should be regarded as permanent or unlimited duration".

[18] Portugal and Netherland disappear from the panel when I build my variables of regression.

Table 1: Sample's composition by Country and Welfare Regimes

Country	N. of bservations	Percentage value
AT	473	2.76
BE	749	4.38
BG	648	3.79
CY	476	2.78
CZ	577	3.37
DK	8	0.05
EE	1,026	6.00
ES	1,704	9.96
FI	28	0.16
FR	2,026	11.84
GR	91	0.53
HU	1,523	8.90
IS	8	0.05
IT	2,051	11.98
LT	1,083	6.33
LU	1,364	7.97
LV	984	5.75
NO	58	0.34
PL	2,071	12.10
SE	43	0.25
UK	123	0.72
Continental	4,612	26.94
Southern	3,846	22.47
Nordic	145	0.87
Anglo-saxon	599	3.50
Eastern	4,819	28.15
Baltic	3,093	18.07
Total	17,114	100.00

Source: Own calculation from longitudinal EU-SILC (2005-2013) dataset

The main independent variables are dummies representing women's and men's economic activity status recorded at time $t-1$. The Table 2 shows that, under a gender perspective, in our sample we have a larger proportion of women with a temporary job than that of men (respectively, 11.4% versus 7.6% at time $t-1$ and 12.4% versus 7.5% at time $t-2$), while the unemployment status is more widespread among men than women (respectively, 10% versus 4% at time $t-1$ and 15.2% versus 5.6% at time $t-2$).

Table 2: Economic activity status

Variable	Absolute frequencies	Relative frequencies	Std. Dev.
Women's economic activity status $(t-1)$***:***			
Permanent contract	14462	0.845	0.361
Temporary contract	1967	0.114	0.318
Unemployed	685	0.040	0.197
Partners' economic activity status $(t-1)$***:***			
Permanent contract	14101	0.824	0.381
Temporary contract	1301	0.076	0.265
Unemployed	1712	0.100	0.300
Women's economic activity status $(t-2)$***:***			
Permanent contract	14033	0.820	0.384
Temporary contract	2123	0.124	0.33
Unemployed	958	0.056	0.229
Partners' economic activity status $(t-2)$***:***			
Permanent contract	13229	0.773	0.419
Temporary contract	1284	0.075	0.263
Unemployed	2601	0.152	0.359
N^o of observations	17114		

Source: Own calculation from longitudinal EU-SILC (2005-2013) dataset

Descriptive statistics are reported in Table 3. The dependent variable is the dummy Fertility that represents the event to "have one (more) child" at time t: 24.9% of the couple records they had. The other control variables for couple's characteristics are age, marital status, number of children, presence of young children (0-5 aged) in the family, health status, level of education, job-skills, household disposable income at net female income.

Table 3: Summary statistics

Variable	Mean	Std. Dev.
Fertility	0.249	0.433
Marital status:		
- Married couples	0.848	0.359
- More uxorio couples	0.152	0.358
N^o Child(ren)	1.917	1.416
Child(ren) under 5 years old	0.284	0.451
Age	37.5	5.371
Partner's Age	41.92	9.072

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Variable	Mean	Std. Dev.
Household Net Disposable Income/1000	33.192	26.536
$HealthStatus_{t-1}$:		
- Good	0.836	0.370
- Fair	0.148	0.354
- Bad	0.016	0.126
$Partner'sHealthStatus_{t-1}$:		
- Good	0.836	0.370
- Fair	0.148	0.355
- Bad	0.016	0.124
Education:		
- Intermidiate Secondary	0.132	0.338
- Higher Secondary	0.495	0.500
- University or more	0.374	0.484
Partner's Education:		
- Intermidiate Secondary	0.196	0.397
- Higher Secondary	0.537	0.499
- University or more	0.267	0.442
$JobSkill_{t-1}$:		
- High Skilled White Collar	0.412	0.492
- Low Skilled White Collar	0.338	0.473
- High Skilled Blue Collar	0.05	0.219
- Low Skilled Blue Collar	0.159	0.366
- Unemployed	0.04	0.197
$Partner'sJobSkill_{t-1}$:		
- High Skilled White Collar	0.35	0.477
- Low Skilled White Collar	0.161	0.368
- High Skilled Blue Collar	0.203	0.402
- Low Skilled Blue Collar	0.216	0.412
- Unemployed	0.069	0.254
N^o of observations	17,114	

Source: Own calculation from longitudinal EU-SILC (2005-2013) dataset

The average age is 37 for women and 42 for men, the average numbers of children is 1.91, and the 28.4% of the sample have the presence of children of which one at least is $0-5$ years old.[19]

The marital status of all sample is in consensual union: the 84.8% with a legal basis, and the rest 15.2% has a consensual union without legal basis.[20]

[19] See the Table 6 Number of children by woman age cohorts - Percentage values and the Figure 6 Number of children across EU countries in Appendix to have informations about the distribution of number of children among female age cohorts and across European countries.

[20] I cannot account for couples' union duration because this information is not available in EUSILC data.

The age of the woman is coded into five cohorts: up to 25, 26-30, 31-35, 36-40, and 41-45.

In the dataset, the health status of each partner is broken down into five categories (very good, good, fair, bad, and very bad) and I sort them in three classes, such as good, fair, and bad and I use the one-year lagged data.[21]

The women's and the partner's education are grouped into three categories, consistent with the International Standard Classification of Education (ISCED). The lowest category corresponds to lower secondary school, primary school, or lower education. In the intermediate level we find people who received upper secondary education or post-secondary, but non-tertiary, education. Individuals with tertiary education are assigned to the highest category.

The women's and the partners' economic conditions are described through six variables, reflecting their gross and disposable income in the reference period (January 1st to December 31st of the previous year). The indicator used for household income is the sum of various types of income sources of the family components, such as employee cash income, non cash income (e.g., company car and associated costs, free or subsidised meals), and social transfers after tax. I build the household disposable income, after the subtraction of the female net income in order to avoid the problem of endogeneity.

Furthermore, the EU-SILC regulation refers to the classification ISCO-88 until 2010 and the classification ISCO-08 from the 2011 (both in 2 digits) to describe labour information on current activity status and current main job, including information on last main job for previously active people. I merged the two classifications to become a single one at 1 digit. I sort the types of occupation in five groups: high skilled white collar, low skilled white collar, high skilled blue collar, low skilled blue collar, and unemployed (for the persons who are seeking their first job). This job-skill variable is refered to the previous year.

Finally, by weighted cross-sectional EU-SILC dataset (from 2004 to 2012), I build the historical series of female unemployment rate, its variation, the share of temporary contracts of the total ones, and its variation, combining with year t-1, age cohorts, job skill classes by countries in order to have a measure of country specific business cycle.

4 Methodological Framework

I model chidbearing, called Fertility, as a binary choice. The dependent variable y may only take the values 1 and 0, which indicate whether the women had at least an another child in the last year or not. At the first step, the conditional

[21] For women I could take two-year lagged information to prevent that an hypothetical pregnancy could tamper with the health condition and, thus, to avoid possible presence of endogeneity with the dependet variable. But, with regard to my instrumental variables, I need to have all one-year lagged control covariates to remove as much as possible the presence of endogeneity between job instability and childbearing. See the next paragraph to have more information.

probability that y_{it} is equal to 1 is specified, for $t = 1, ..., T$ and $i = 1, ..., N$, as follows

$$\begin{aligned} P(y_{it} = 1|C(\cdot)_{it-1}, X_{it-1}, Z_i, c_i) = \\ = E(y_{it}|C(\cdot)_{it-1}, X_{it-1}, Z_i, c_i) = \\ = C(w)'_{it-1}\beta_1 + C(p)'_{it-1}\beta_2 + X'_{it-1}\delta + Z'_i\gamma + c_i, \quad (1) \end{aligned}$$

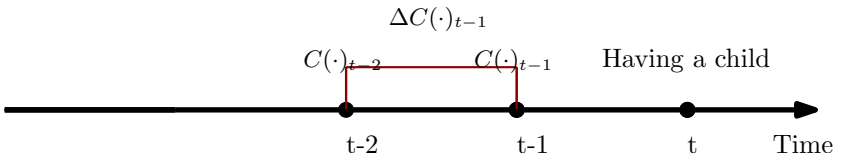
where $C(\cdot)_{it-1}$ indicates my two interest variables, such as $C(w)_{it-1}$ for woman and $C(p)_{it-1}$ for partner, and they are vectors 3×1 concerning the time-varying dummy variables related to the three possible economic activity status in labour market (Table 2). X_{it-1} is a vector of time-varying control variables of the woman and her partner, such as job-skill levels, class of disposable income, health status, and age cohorts. Z_i corresponds to time-invarying control variables of the woman and her partner, such as education levels, countries, marital status, and number of children. Finally, c_i is unobserved heterogeneity. The model in Equation (3.1) is in the error equation form as

$$y_{it} = C(w)'_{it-1}\beta_1 + C(p)'_{it-1}\beta_2 + X'_{it-1}\delta + Z'_i\gamma + c_i + \varepsilon_{it}, \quad (2)$$

where ε_{it} is an idiosyncratic error term. The coefficients of interest are β_1 and β_2, which are the marginal effect of couples' economic activity status had in the previous year on the probability of having an additional child at time t. If c_i were not correlated to $C(w)_i$ and $C(p)_i$, where $C(\cdot)_i \equiv [C(\cdot)_{it}, C(\cdot)_{it-1}, C(\cdot)_{it-2}, ..., C(\cdot)_{i1}]$, and $C(\cdot)_i$ were strictly exogenous, i.e. $E(\varepsilon_{it}|C(\cdot)_i, X_i, H_i, Z_i) = 0$ for all $t = 1, ..., T-1$, then the Ordinary Least Square (OLS) estimator[22] of Equation (3.2) would return unbiased and consistent estimates of β_1 and β_2 and would ignore the presence of c_i. However, the study of the association between female activity status in labour market, especially precarious status, and fertility may be driven by several unobserved factors. First, employed women with a short-term contracts are not a random sample of population, and it may be a problem of selection bias: in fact, they may have disparate observed and unobserved characteristics, such as preference for children, individual abilities, and diversity in fecundity. If $Cov(C(\cdot), c_i) \neq 0$, I cannot consistently estimate Equation (3.2) by OLS simply ignoring c_i. Second, there may be feedback effects, i.e. shocks in the fertility affecting the future economic activity status in the labour market. For instance, couples with a positive transitory shock in the probability of childbirth might have a different behaviour (also by gender) in future career paths, in

[22] My dependent variable is a dummy, but I choose a Linear Probability Model instead a probit because the most of the covariates are categorical and the model is almost saturated. A fully saturated LPM does not suffer from out of range of predicted probabilities.

Figure 3: Time Line



accumulating human capital, and, thereby, in job stability choices. In addition, the analysis of this phenomenon may lead to be a problem of 'reverse causality': women with strong preferences for children (and with highest marginal utility of children) could decrease their own levels of education and their labour market attachment, and may choose stable job, but with lower earning profiles (Francesconi 2002).

To solve the unobserved heterogeneity problem I take the first difference of both sides of Equation (3.2), so I get rid of the fixed effects c_i (and Z_i that corresponds to time-invarying control variables of the woman and her partner), as following:

$$\Delta y_{it} = \Delta C(w)'_{it-1}\beta_1 + \Delta C(p)'_{it-1}\beta_2 + \Delta X'_{it-1}\delta + \Delta\varepsilon_{it}. \tag{3}$$

$\Delta C(\cdot)_{it-1} = C(\cdot)_{it-1} - C(\cdot)_{it-2}$ becomes the first difference of each of the three economic activity status for women and for partners had from time t-2 to time t-1; their values are -1 or 1 whether it recorded a change of type of contract or unemployment status and 0 otherwise.

Under the strict exogeneity assumpion, the OLS estimator produces unbiased estimates of the coefficients in Equation (3.3). However, the possible presence of feedback effects from y_{it} to $C(\cdot)_{ir}$ with $r \geqslant t$[23] (i.e. shocks in the fertility affecting the future activity status in the labour market) would fail the strict exogeneity assumption. I relax this assumption and replace it by the sequential moment restriction (Chamberlain 1992): $E(y_{it}|C(\cdot)_{it-1}, C(\cdot)_{it-2}, ..., C(\cdot)_{i1}, X_{it-1}, Z_i, c_i) = 0$ for all $t = 1, ..., T$. So, I allow correlation between ε_{it} and the current and future occupational transitions $(C(\cdot)_t, C(\cdot)_{t+1}, ..., C(\cdot)_{t+T})$: in other words, I assume that once I condition on $(C(\cdot)_{it-1}, X_{it-1}, Z_i, c_i)$, a shock in pregnancy at time t could have an effect on activity status in the future (Wooldridge 2010; Picchio and van Ours 2016).

Henceforth, under the sequential moment restriction, the longitudinal dimension of the panel provides available instruments to take into account the potential endogeneity of $\Delta C(\cdot)_{it-1}$ in Equation (3.3) because of feedback effects: the lag of my indipentent variable of interest $C(\cdot)_{it-2}$ should be not correlated

[23] In this case the equivalence is valid because there is a temporal synchronicity between getting pregnant and the economic activity status but I consider childbirth as dependent variable so the timing shifts on one period.

to $\Delta\varepsilon_{it}$ and it is a strong predictor of $\Delta C(\cdot)_{it-1}$ by construction. So, I use the Two Stage Least Square (2SLS) estimator with $C(\cdot)_{it-2}$ as instrument for $\Delta C(\cdot)_{it-1}$ to consistently estimate Equation (3.3) in presence of endogeneity.[24]

5 Main results and heterogeneous effects analyses

5.1 Main results

Table 4 reports the cross-country estimation results in level and in first-differences of the Linear Probability Model in Equation (3.1) with the type of economic activity status recorded in the labour market by both partners as the measure of job instability. The First Differences OLS is more advisable than the Levels OLS because the First Differences OLS does not ignore the presence of unobserve heterogeniety. Because I can account for the possible presence of endogeneity of $\Delta C(\cdot)_{it-1}$ in First-Difference 2SLS model. An Hausman test is used and it rejects absence of endogeneity (F(4, 12204) = 2.80; p-value = 0.0246) and the instruments are correlated with the regressors and not weakly (Kleibergen-Paap Wald rk F statistic is major than the rule of 'thumb' level of 10) and they are valids. So, using a 2SLS model in first difference I estimate the cross-country average effects of job instability (with respect to workers in job stability) on childbirth for both the partners in order to avoid to produce a bias in the estimations due to lack of partnern's characteristics (Matysiak and Vignoli 2008).

[24] Find valid instruments is a very nontrivial question for this literature. In order to confirm the validity of the exclusion restriction assumption, in the future, I could estimate the model using $C(\cdot)_{it-3}$ as the instrumental variables, even if the size of the panel reaches the order of 6,000 units and it drops the number of countries and the importance of interpretation of the results. Furthermore, I consider that, controlling for all previous covariates and getting rid of unobserved effects, this process of choice affected more by the first-order lag of economic activity status than the further lags. However, the interpretations of the results as causal effects must be done with caution.

Table 4: Estimation results of the model for fertility in levels and first differences

	Levels OLS			First-difference OLS			First-difference 2SLS, instruments c_{it-2}		
Fertility	Coeff.		Robust S.E.	Coeff.		Robust S.E.	Coeff.		Robust S.E.
Woman's economic activity status - Reference: Permanent contract									
Temporary contract	0.007		0.0107	0.013		0.0112	0.078	***	0.0271
Unemployed	0.015		0.0143	-0.001		0.0133	0.060	**	0.0251
Partner's economic activity status - Reference: Permanent contract									
Temporary contract	0.009		0.0091	0.011		0.0110	0.007		0.0207
Unemployed	-0.009		0.0091	0.003		0.0087	-0.010		0.0131
Woman's Job Skills - Reference: Unemployed									
High skilled white collar	0.050	***	0.0176	-0.008		0.0132	-0.009		0.0132
Low skilled white collar	0.044	**	0.0151	0.002		0.0125	0.001		0.0125
High skilled blue collar	0.047	**	0.0233	-0.007		0.0257	-0.004		0.0256
Low skilled blue collar	0.030		0.0170	-0.015		0.0121	-0.016		0.0121
Partner's Job Skills - Reference: Unemployed									
High skilled white collar	-0.013		0.0148	-0.033	***	0.0052	-0.033	***	0.0052
Low skilled white collar	-0.015		0.0153	-0.026	***	0.0089	-0.026	***	0.0089
High skilled blue collar	-0.002		0.0147	0.032	***	0.0089	0.032	***	0.0089
Low skilled blue collar	-0.022		0.0145	0.041	***	0.0071	0.041	***	0.0071
Woman's Age Cohorts - Reference: 15-25 age									
26-30 age	0.051	**	0.0239	0.010		0.0314	0.014		0.0314
31-35 age	0.027		0.0239	0.042	**	0.0183	0.043	*	0.0183
36-40 age	-0.010		0.0239	0.014		0.0137	0.014		0.0137
41-45 age	0.013		0.0240	0.006		0.0118	0.006		0.0118
Woman's Health - Reference: Good									
Fair	0.006		0.0089	0.005		0.0114	0.005		0.0115
Bad	-0.002		0.0229	0.004		0.0200	0.003		0.0198

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	Levels OLS			First-difference OLS			First-difference 2SLS, instrument c_{it-2}		
Fertility	Coeff.		Robust S.E.	Coeff.		Robust S.E.	Coeff.		Robust S.E.
Partner's Health - Reference: Good									
Fair	0.008		0.0090	0.004		0.0116	0.004		0.0116
Bad	0.024		0.0251	-0.018		0.0187	-0.016		0.0187
Household Disposable Income/1000	-0.001		0.0003	0.001		0.0004	0.001		0.0001
Number of children	0.076	***	0.0029	–		–	–		–
Presence of 0-5 aged child	0.148	***	0.0089	–		–	–		–
Marital status - Reference: Married									
More uxorio union	0.028	***	0.0098	–		–	–		–
Woman's Education - Reference: Primary and lower secondary									
Upper secondary	-0.011		0.0116	–		–	–		–
University and more	0.006		0.0138	–		–	–		–
Partner's Education - Reference: Primary and lower secondary									
Upper secondary	0.001		0.0092	–		–	–		–
University and more	-0.008		0.0118	–		–	–		–
Country - Reference: France									
Austria	0.047	*	0.0255	0.002		0.0278	0.001		0.0278
Belgium	-0.043	*	0.0223	-0.101	***	0.0236	-0.102	***	0.0235
Bulgaria	-0.099	***	0.0230	-0.167	***	0.0218	-0.166	***	0.0218
Cyprus	0.020		0.0265	0.049	*	0.0284	0.048	*	0.0283
Czech Republic	0.138	***	0.0248	0.147	***	0.0261	0.148	***	0.0260
Denmark	-0.251	**	0.1115	-0.284	**	0.1216	-0.285	**	0.1214
Estonia	-0.310	***	0.0164	-0.384	***	0.0149	-0.382	***	0.0149
Spain	-0.093	***	0.0183	-0.143	***	0.0190	-0.140	***	0.0190
Finland	-0.046		0.0971	-0.117		0.1029	-0.121		0.1015

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	Levels OLS			First-difference OLS			First-difference 2SLS, instrument c_{it-2}		
Fertility	Coeff.		Robust S.E.	Coeff.		Robust S.E.	Coeff.		Robust S.E.
Greece	0.091	*	0.0527	0.161	***	0.0550	0.162	***	0.0550
Hungary	-0.261	***	0.0166	-0.363	***	0.0144	-0.360	***	0.0144
Iceland	-0.244		0.1584	-0.163		0.1649	-0.162		0.1615
Italy	-0.151	***	0.0155	-0.217	***	0.0159	-0.215	***	0.0159
Lithuania	-0.227	***	0.0184	-0.308	***	0.0165	-0.306	***	0.0166
Luxembourg	-0.029		0.0200	-0.073	***	0.0199	-0.074	***	0.0199
Latvia	-0.234	***	0.0182	-0.304	***	0.0165	-0.301	***	0.0166
Norway	-0.089		0.0627	-0.075		0.0640	-0.083		0.0632
Poland	-0.155	***	0.0179	-0.199	***	0.0165	-0.196	***	0.0165
Sweden	-0.128	*	0.0759	-0.080		0.0734	-0.072		0.0734
United Kingdom	-0.030		0.0390	-0.100	**	0.0429	-0.106	**	0.0165
temp-contr	0.014	*	0.0085	0.013		0.0083	0.013		0.0084
Δ*temp-contr*	-0.008		0.0067	-0.006		0.0064	-0.006		0.0064
fur	-0.035		0.0586	-0.099	**	0.0489	-0.098	**	0.0488
Δ*fur*	0.048		0.0469	0.063		0.0475	0.064		0.0458
Year's dummies - Reference: 2008									
2007	0.021	*	0.0114	–		–	–		–
2009	-0.024	**	0.0108	-0.055	***	0.0103	-0.054	***	0.0103
2010	-0.029	**	0.0116	-0.055	***	0.0109	-0.054	***	0.0109
2011	-0.056	***	0.0119	-0.087	***	0.0110	-0.086	***	0.0110
2012	-0.069	***	0.0124	-0.103	****	0.0114	-0.102	***	0.0114
2013	-0.072	***	0.0120	-0.114	**	0.0108	-0.112	***	0.0109
Constant	0.178	***	0.0342	0.472	***	0.0152	0.470	***	0.0153
# of observations NT (N)	17114 (12205)			17114 (12205)			17114 (12205)		

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	Levels OLS		First-difference OLS		First-difference 2SLS, instrument c_{it-2}	
Fertility	Coeff.	Robust S.E.	Coeff.	Robust S.E.	Coeff.	Robust S.E.
R2	0.2167		0.1271		–	
Hausman Test of endogeneity	–		–		F(4, 12204) = 2.80	
	–		–		p-value = 0.0246	
Weak identification test (cluster robust):						
Kleibergen-Paap Wald rk F statistic	–		–		390.227	

Notes: * Significant at 10%; ** Significant at 5%; *** Significant at 1%.The standard errors are robust to heteroskedasticity and within-individual correlations. "First-difference" refers to the model in which I use the first differences of C_{it-1} to avoid the unobserved heterogeneity. "2SLS, instruments C_{it-2}" refers to the model in which I use the 2SLS estimator with C_{it-2} as valid instruments for ΔC_{it-1} to test the presence of endogeneity.

Source: Own estimations from longitudinal EU-SILC (2005-2013) dataset

In general terms, the cross-country average effects of recording previous events of job instability on childbearing do not present statistical relevance for men with respect to couples with permanently employed, while for women having a temporary job or being in unemployment increase the likelyhood of having one (more) child by 7.8 and 6.0 percentage points. As we consider several European countries, the average impact of job instability would be explained like a drop of opportunity-cost of childbearing is larger of the raising of a sort of "economic stability effect" for women *ceteris paribus*. It should be interesting drawing the subsamples of women with one child and of childless ones to focus on the possible heterogeneity of the opportunity-cost of childbearing during the time (Greulich et al. 2016, Auer et al. 2013).

As far as the women's occupational skills is concerned, we can observe that only for men all the classes have statistical relevance, but with different magnitudes and signs. As the findings of Auer and Danzer (2015) using German data, with respect to be unemployed, the blue collar workers affects positively and significantly the having an another child by 4.1 percentage points for low-skilled workers and by 3.2 percentage points for high-skilled ones; while the white collar workers affects negatively and significantly the childbirth by 2.6 and 3.3 percentage points rspectively for low-skilled workers and high-skilled ones.

With respect to female age cohort, being between 31 and 35 years old has a statistical significant effect on childbearing by 4.3 percentage points and it is in line with the European parenthood trends.

As expected, increasing levels of household disposable income (at net of woman's earning) has an positive impact but without a statistical relevance.

As argue Sobotka et al. (2011), the year's dummies reflect a wide depression on the probability to the childbirth during all the concerned years of economic recession and also controlling for the female unemployement rate of aech country reveals a negative and statistical significant impact.

Finally, the more relevant aspect that emerges from these results is that the average of effects across countries are hugely characterized by the country fixed effects. With respect to France (known for efficient pro-fertility policies), all the other countries are statistically significants with the only exception of Austria and Nordic countries. Most of the countries have an negative impact that does not reach the 10 percentage points only for Continental countries. The sign becomes positive only for Cyprus, Czech Republic, and Greece, where there are different welfare regimes, concerning respectively the groups of Anglo-saxon, Eastern, and Southern Europe.

5.2 Heterogeneous effects analysis

As previously discussed, I consider that it could be appropriate to repeat the estimation selecting 21 countries which reflect the peculiarities of different six welfare regimes (cfr the 3 paragraph). Continental welfare regime provides benefits targeted to individuals who belong to specific categories, such as families or a specific type of worker, and groups Austria, Belgium, France, and Luxembourg.

Southern European regime is composed by Spain, Italy, and Greece, where welfare coverage is often residual and left to the family, with limited social benefits (Ferrera 2005). Nordic one is composed by Norway Finland, Denmark, and Iceland, which characterized by universalistic welfare systems with large social supports pro work and family policies and against unemployment. The Anglo-Saxon one (United Kingdom, Cyprus) is liberal welafre regime, but without rigidities to (re)entry into the labour market. Finally, Eastern Europe regime with Czech Republic, Poland, Bulgaria, and Hungary presents for temporary workers limitations in qualifying of eligibility for unemployment benefits[25], and Baltic one with Estonia, Latvia, and Lithuania those show very low shares of female temporary workers on total employment and below 3%.[26]

Accounting for unobserved heterogeniety, the Table 5 show the First Differences OLS and the First Difference 2SLS model, where I interact six dummy variables of welfare regimes with the woman's and partners' economic activity status to estimate the probability of having an addictional child in Equation (3.1). I choose the 2SLS model because I account for the possible presence of endogeneity of $\Delta C(\cdot)_{it-1}$ in First-Difference 2SLS model using as instruments $C(\cdot)_{it-2}$, each one interacts with six dummy variables of welfare regimes. An Hausman test is used and it rejects the null hypethesis of absence of endogeneity ($F(24, 12204) = 14.32$; p-value $= 0.0000$) and the instruments are correlated with the regressors and not weakly, in fact the Kleibergen-Paap Wald rk F statistic is equal to 67.930, major than the rule of 'thumb' level of 10.

[25] See footnote 10.

[26] See Figure 2. Furthermore, concerning family formation trends, these countries move closer to Continental countries with 50% of young people leave home in line with the EU average (Eurofound 2016).

Table 5: Estimation results of the model for fertility controlling for welfare regimes in first differences

	First-difference OLS		First-difference 2SLS, instruments c_{it-2}	
Fertility	Coeff.	Robust S.E.	Coeff.	Robust S.E.
Group of Countries: Continental				
Woman's economic activity status - Reference: Permanent contract				
Temporary contract	-0.027	0.0265	-0.267 ***	0.0718
Unemployed	-0.019	0.0340	-0.194 ***	0.0665
Partner's economic activity status - Reference: Permanent contract				
Temporary contract	-0.008	0.0243	-0.252 ***	0.0494
Unemployed	-0.071 ***	0.0150	-0.185 ***	0.0212
Group of Countries: Eastern				
Woman's economic activity status - Reference: Permanent contract				
Temporary contract	0.007	0.0180	0.102 **	0.0434
Unemployed	0.004	0.0217	0.130 ***	0.0428
Partner's economic activity status - Reference: Permanent contract				
Temporary contract	0.015	0.0181	0.078 **	0.0353
Unemployed	-0.003	0.0167	-0.007	0.0275
Group of Countries: Nordic				
Woman's economic activity status - Reference: Permanent contract				
Temporary contract	0.190	0.1619	-0.156	0.4985
Unemployed	0.149	0.1507	0.024	0.3167
Partner's economic activity status - Reference: Permanent contract				
Temporary contract	- 0.010	0.1116	-0.121	0.2046
Unemployed	-0.077	0.0867	-0.220	0.1553

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Fertility	First-difference OLS Coeff.		Robust S.E.	First-difference 2SLS, instrument c_{it-2} Coeff.		Robust S.E.
Group of Countries: Baltic						
Woman's economic activity status - Reference: Permanent contract						
Temporary contract	0.048		0.0230	0.275	***	0.0456
Unemployed	0.053	**	0.0248	0.284	***	0.0364
Partner's economic activity status - Reference: Permanent contract						
Temporary contract	-0.001		0.0285	0.211	***	0.0561
Unemployed	0.012		0.0182	0.236	***	0.0426
Group of Countries: Southern						
Woman's economic activity status - Reference: Permanent contract						
Temporary contract	0.022		0.0235	0.074		0.0552
Unemployed	-0.029		0.0364	0.023		0.0673
Partner's economic activity status - Reference: Permanent contract						
Temporary contract	0.025		0.0251	0.026		0.0454
Unemployed	-0.002		0.0227	-0.020		0.0356
Group of Countries: Anglo-saxon						
Woman's economic activity status - Reference: Permanent contract						
Temporary contract	0.071		0.0944	-0.163		0.3344
Unemployed	0.045		0.1063	-0.175		0.1930
Partner's economic activity status - Reference: Permanent contract						
Temporary contract	0.068		0.0743	-0.381	***	0.1453
Unemployed	-0.067		0.0419	-0.295	***	0.0646

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Fertility	First-difference OLS Coeff.		Robust S.E.	First-difference 2SLS, instrument c_{it-2} Coeff.		Robust S.E.
Woman's Job Skills - Reference: Unemployed						
High skilled white collar	-0.013		0.0138	-0.015		0.0144
Low skilled white collar	-0.007		0.0130	-0.002		0.0137
High skilled blue collar	-0.001		0.0267	0.007		0.0273
Low skilled blue collar	-0.018		0.0131	-0.015		0.0134
Partner's Job Skills - Reference: Unemployed						
High skilled white collar	-0.057	***	0.0072	-0.055	***	0.0056
Low skilled white collar	-0.036	***	0.0093	-0.034	***	0.0094
High skilled blue collar	0.054	***	0.0095	0.053	***	0.0097
Low skilled blue collar	0.064	***	0.0072	0.065	***	0.0074
Woman's Age Cohorts - Reference: 15-25 age						
26-30 age	0.045		0.0328	0.038		0.0331
31-35 age	0.060	*	0.0195	0.061	***	0.0203
36-40 age	0.016		0.0144	0.015		0.0148
41-45 age	-0.004		0.0123	-0.001		0.0125
Woman's Health - Reference: Good						
Fair	-0.006		0.0120	-0.005		0.0123
Bad	0.001		0.0207	0.001		0.0216
Partner's Health - Reference: Good						
Fair	-0.011		0.0121	-0.005		0.0124
Bad	-0.012		0.0203	0.001		0.0210
Household Disposable Income/1000	0.001		0.0155	0.001	*	0.0005

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	First-difference OLS			First-difference 2SLS, instrument c_{it-2}		
Fertility	Coeff.		Robust S.E.	Coeff.		Robust S.E.
temp-contr	0.051	***	0.0074	0.051	***	0.0074
Δ*temp-contr*	-0.031	***	0.0063	-0.031	***	0.0064
fur	-0.323	***	0.0483	-0.306	***	0.0487
Δ*fur*	0.200	***	0.0471	0.211	***	0.0480
Year's dummies - Reference: 2008						
2009	-0.052	***	0.0109	-0.057	***	0.0112
2010	-0.044	***	0.0115	-0.052	**	0.0118
2011	-0.056	***	0.0115	-0.061	**	0.0117
2012	-0.066	***	0.0114	-0.069	**	0.0116
2013	-0.104	***	0.0109	-0.106	***	0.0112
Constant	0.292	***	0.0086	0.290	***	0.0088
# of observations NT (N)	17114 (12205)			17114 (12205)		
R2	0.0347			–		
Hausman Test of endogeneity	–			F(24, 12204) = 14.32		
	–			p-value = 0.0000		
Weak identification test (cluster robust):						
Kleibergen-Paap Wald rk F statistic	–			67.930		

Notes: * Significant at 10%; ** Significant at 5%; *** Significant at 1%.The standard errors are robust to heteroskedasticity and within-individual correlations. "First-difference" refers to the model in which I use the first differences of C_{it-1} to avoid the unobserved heterogeneity. "2SLS, instruments C_{it-2}" refers to the model in which I use the 2SLS estimator with C_{it-2} as valid instruments for ΔC_{it-1} to test the presence of endogeneity.

Source: Own estimations from longitudinal EU-SILC (2005-2013) dataset

As expected, the results show the presence of heterogeniety in job instability effects on childbearing among welfare regimes.

In general terms, the previuos findings relative to the economic activity status of the couple are very different when I classify the countries into the welfare groups, while the other results appear in line with those of benchmark model.

In particular, in Continental countries, with respect to have a stable job, instability in the labour market presents a negative sign that becomes always statistically significant in First Difference 2SLS model for women and for men with temporary jobs as well as in unemployment: for both genders, the size of the temporary job's effects is larger than unemployement's one. Thus, the expected results seem to be confirmed: the job instability affects negatively chilbearing following a lower opportunity-cost. Furthermore, under a 'gender perspective', the gender gap blows up but it is narrow; it could confirm the presence of suitable gender equality policies in these countries.

As far as Eastern and Baltic countries are concerned, for women, with respect to have a permanent contract, both the unemployment and the temporary contracts affect positively and statistical significantly the probability of childbearing, while for men these effects have a statistical relevance in First Difference 2SLS model. It might be explained by the current socio-cultural traditions that I have described earlier. The scarce use of job instability (in term of share) could explain as 'voluntary' choice linked to the low of opportunity-cost of childbearing. It could also clear because these effects are larger for unemploymed status.

For Anglo-saxon countries, instead, the unemployment has a different pattern by gender with respect to the stable job in First Differences OLS model: for women it encourages the childbearing, while, for men, not work discourages it, while the men with a temporary contract have a positive effects. While in First Difference 2SLS model these findings change and all ones become negative. Only the temporary work for women is not statistical significant. They could be in line with the reason that in a labour market with limitated welfare policies the loss of job discourages fertility choices, but the degree of job flexibility is such that a temporary work does not affect the fertility.

As far as the Southern European countries, for women only have a temporary contract has a statistical relevance and the impact is positive compared to permanet job in First Differences OLS model. It could be linked with the Grecian positive large effect recorded in the main estimation. These countries have a socio-cultural linkage with the family institution. This effect disappears in First Difference 2SLS model. The reason could be that the impact of parents' successful labour market integration might be ambiguous in low-lowest fertility countries, due to the absence of child care options and/or cultural norms (Matysiak and Vignoli 2008).

Finally, as far as Nordic countries are concerned, all the economic activity statuses have not statistical relevance, but it do not surprise because we know that in these countries there are large social supports and policies (e.g. Danish flexicurity model) and they might withdraw the job instability effects.

6 Conclusions and Policy Implications

The empirical analysis of this study focus on European countries during the years of recent economic recession started in 2008, in which the puzzle is varying, where higher-low fertility countries are mixed with lower-low fertility ones, as well as with regards to female labour force participation rates, and different welfare regimes with own institutional support for workers.

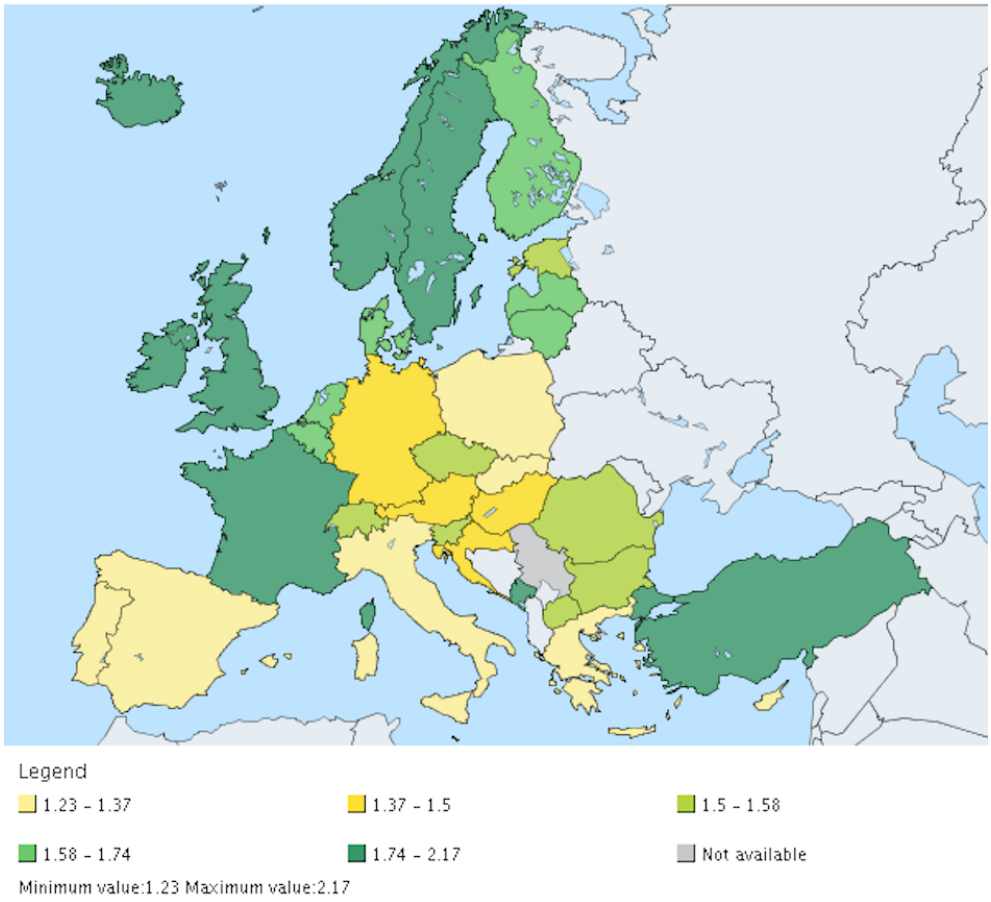
The principal result is that in this specific pattern the cross-country average effect of job instability on couple's fertility decisions is not statistical relevant because of the huge country-specific fixed effects. Only having a temporary job for women encourages chilbearing, in average, and this effect is in line with the mainstream theory that explains the fertility choice in based on the opportunity-cost of childbearing.

Furthermore, when I analyze these impacts, distinguishing through the six different welfare regimes, I can capture more information about the couples' fertility choices: the more relevant one is how much the institutional structure and linked social active policies weights in the family behaviour, overall in a framework of economic uncertainty.

As this ability also depends on a country's degree of support for combining work and family, the relation between female employment and fertility might differ across countries. In low-fertility countries, however, it is confirmed that the impact of parents' successful labour market integration might be ambiguous, due to the absence of child care options and/or cultural norms (Matysiak and Vignoli 2008). It could be interesting a country-specific analysis.

7 Appendix

Figure 4: Total Fertility Rate, 2013 - EU countries



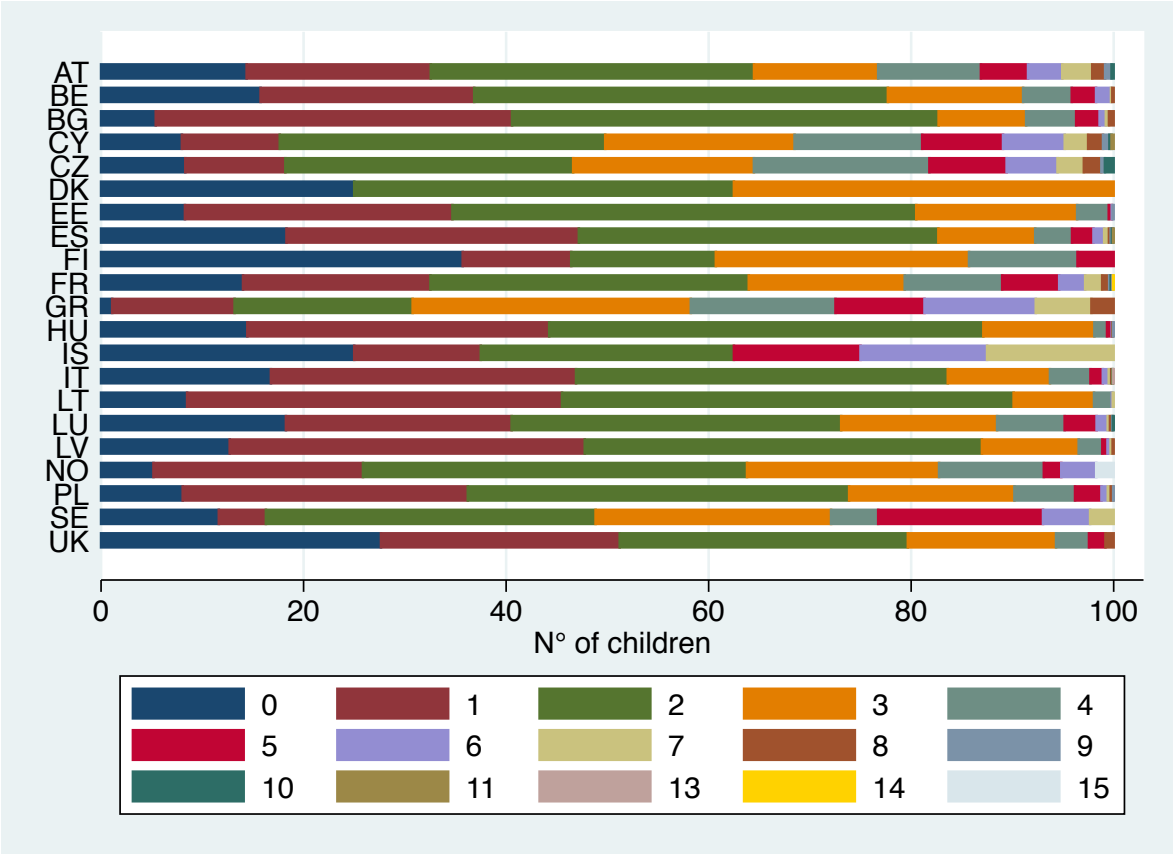
Source: Own elaboration from Eurostat data

Figure 5: Qualifying period for unemployment benefits - EU countries

	Number of months of work/ insurance/contributions (a)	Reference period (b)	Ratio (a/b)	Comments
NL	6 months	8 months	0.75	*Maximum duration 3 months. Those employed for 52 days or more in 4 of 5 last years qualify for benefit for no. of months in work up to 38. Voluntary unemployment insurance scheme for self-employed.*
LV	9 months	12 months	0.75	*Person has also to be insured for at least a year. Self-employed are not eligible for unemployment benefits.*
IE	9 months of paid/credited contribs (at least 3 months paid)	12 months	0.75	*Total of 24 months paid contributions also required. Self-employed are not eligible for unemployment benefits.*
PL	12 months	18 months	0.67	*Voluntary unemployment insurance scheme for self-employed.*
BG	9 months	15 months	0.60	*Self-employed are not eligible for unemployment benefits.*
BE	10-20 months	18-36 months	0.56	*Varies with age of worker. Self-employed are not eligible for unemployment benefits.*
CZ	12 months	24 months	0.50	*Before 2012, reference period was 3 years.*
DE	12 months	24 months	0.50	*Voluntary unemployment insurance scheme for self-employed.*
IT	12 months	24 months	0.50	*2 years of insurance also required.* *Self-employed are not eligible for unemployment benefits.*
PT	12 months	24 months	0.50	*Before 2012, reference period was 22 months. Self-employed are not eligible for unemployment benefits (except bogus self-employed).*
RO	12 months	24 months	0.50	*Voluntary unemployment insurance scheme for self-employed.*
AT	12 months	24 months	0.50	*6 months of insurance in 12 months for <25.* *Voluntary insurance for self-employed.*
LT	18 months	36 months	0.50	*Self-employed are not eligible for unemployment benefits.*
SK	24 months	48 months	0.50	*2 years of insurance in 4 for temporary workers. Self-employed without employees are not eligible for unemployment benefits.*
LU	6 months	12 months	0.50	
SE	6 months	12 months	0.50	*6 months of work with at least 80 hours a month. Earnings-related benefit: optional for employees and self-employed.*
SI	9 months	24 months	0.38	*Previously 12 months in 18 months.*
EE	12 months	36 months	0.33	*Self-employed are not eligible for unemployment benefits.*
HU	12 months	36 months	0.33	
DK	12 months	36 months	0.33	*Voluntary unemployment insurance scheme for self-employed (as for employees).*
FI	8 months	28 months	0.29	*Basic unemployment allowance: + min 18 hours of work per week. (18 months in the last 48 months for self-employed).* *Earnings-related unemployment allowance: optional for employees and self-employed.*
MT	4.5 months	24 months	0.19	*Total of 50 weeks of paid contributions also required. Self-employed are not eligible for unemployment benefits.*
EL	4 months	24 months	0.17	*For first-time claimants (for 2nd claims: 6 months in the last 14 months). Self-employed are not eligible for unemployment benefits.*
ES	12 months	72 months	0.17	*Voluntary unemployment insurance scheme for self-employed.*
FR	12 months	28 months	0.14	*Voluntary unemployment insurance scheme for self-employed.*
CY	12 months	-	-	*In addition, paid insurance of at least 26 times weekly basic earnings (€170) and in relevant contribution year, 20 times or more. Self-employed are not eligible for unemployment benefits.*
UK	-	-	-	*No qualifying period, but contributions in 2 tax years of at least 50 times basic weekly contribution and in 1 of 2 at least 26 times. Self-employed are not eligible for unemployment benefits.*
NO	-	-	-	*Income from work of at least 1.5 times Basic Amount (€10,842) in previous calendar year or average of at least Basic Amount in last 3 years. Self-employed are not eligible for unemployment benefits.*

Source: Eurofound (2013), p. 41, Annex Table 8

Figure 6: Number of children across EU countries



Source: Own calculation from longitudinal EU-SILC (2005-2013) dataset

Table 6: Number of child(ren) by woman age cohorts - Percentage values

	Number of Child(ren)															
Age Classes	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
15-25	54.83	28.35	9.03	5.61	0.62	0.62	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100
26-30	36.30	33.95	17.36	6.71	2.73	1.42	0.98	0.16	0.27	0.05	0.05	0.00	0.00	0.00	0.00	0.00	100
31-35	16.26	30.79	33.58	9.75	5.36	2.10	1.15	0.49	0.27	0.14	0.11	0.00	0.00	0.00	0.00	0.00	100
36-40	7.15	24.48	41.96	14.52	6.06	3.15	1.32	0.82	0.36	0.06	0.10	0.00	0.00	0.02	0.00	0.00	100
41-45	7.12	22.33	42.55	15.85	6.36	2.87	1.45	0.74	0.41	0.13	0.08	0.05	0.00	0.02	0.02	0.02	100
Total	13.10	26.15	37.13	12.97	5.56	2.59	1.29	0.64	0.34	0.10	0.09	0.02	0.00	0.01	0.01	0.01	100

Source: Own calculation from longitudinal EU-SILC (2005-2013) dataset

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