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Doctoral Thesis

Where is women's revolution going?
The effects of education and employment on fertility behaviours across Europe

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Introduction

The role and the social status of women around the world is strictly tied to fertility. When we try to disentangle the link between fertility trends and women status, we need to consider two important factors: education and gender equity and, consequently, the relation between them.

Until the end of the 1950s, marriage and childbearing were strictly connected processes in Western societies; moreover, the male-breadwinner and female homemaker and caretaker model prevailed. In this model there is a strict division of roles based on gender. The presence of inequalities between husband and wife is justified by economic theory referred to the theory of comparative advantage (Becker, 1981). According to this perspective, in fact, the partners compare their marginal productivity related to work and domestic activities with the aim of maximising the allocation of family resources, suggesting that men have an "advantage" in terms of labour market activities. Therefore, the optimal choice becomes the division of role within the couple, according to which men are specialised in work activities, while women in home and child care activities. In this pattern, women's age and men's earnings at marriage are considered the main determinants of fertility behaviour: in general, husbands who were in charge of the family income, are more educated than their wives. Instead, women's participation in the labour market is characterized by intermittences or it is non-existent.

However, since the end of the 1960s and beginning of the 1970s, a combination of structural changes led to the so-called "quiet revolution" (Goldin, 2006). The expansion in women education increased year by year in many European countries and, since 1990s, tertiary educated women have surpassed tertiary educated men (Vincent-Lancrin, 2008). Nowadays, higher educated women tend to be more involved in the labour market and, consequently, they need partners more involved in household work and childcare activities to engage in motherhood (McDonald 2000a, 2000b; Huinink, Kohli, 2014). Moreover, since 1990s, another phenomenon has drawn the attention of many scholars: the fertility below the replacement level, that concerns many European countries. In fact, persistent low fertility affects the age structure of population and have both short- and long-term consequences for

social protection systems: like pension and healthcare system. According to gender theories (McDonald 2000a; 2000b) higher fertility rates are associated with gender equality at macro-level and with gender equity at micro- level. Based on these theories, Esping-Andersen (2009) outlines that gender egalitarianism is becoming the norm and European countries are experiencing this change, which is a booster for fertility. This theory suggests that participation in the public sphere, in the labour market and in the political institutions invest more in higher educated and career-oriented women, who lead the revolution towards a more gender egalitarianism society. Goldscheider, Bernhardt and Lappegård (2015) underline that outcomes of the completeness of the gender revolution are the recovery in fertility rates, the increasing stability of unions and the declining divorce rates. All these frameworks that consider gender egalitarianism as the key factor to increase fertility to the replacement level and have had also a positive effect on increasing the interest toward the role of women in fertility studies. These theoretical approaches observe the relationship between, on the one hand, education and labour market participation and, on the other hand, fertility as an indicator of the changes in the society.

All these frameworks that consider gender egalitarianism the key to enhance fertility to the replacement level have had also a positive effect on increasing the interest toward the new role of women and its impact on family life. In fact, only a minority sees the women's revolution with suspicion and hopes that this will regress; however, there is a considerable worry about the final consequences: in particular, there is a concern about the fact that female education implies low birth rates, family instability and increase in divorce. In fact, the "ever-less family scenario" is what is predicted by two theoretical perspectives: the first one, New Home Economics Theory (NHE), theorised by Gary Becker, as we outlined, identifies in the couple specialisation (man in paid work and women in domestic work) the key characteristic of high fertility. And, consequently, the lack of task specialisation and changing economic role of women destabilises this "advantage", conducting to low fertility. The other theoretical framework, known as Second Demographic Transition (SDT), predicts the same outcome, stressing the role of "postmodern values", which promotes individualist lifestyles.

Research now are demonstrating that if there is an adaptation to the new role of women both at partnership and society level, stronger and more stable families

emerge. However, if it is true that the highly educated women who moved from housewifery into employment are the forerunners, because they opted for lifelong full-timer status and if it is true that high-status women are most likely to have a partner that have similar characteristics (homogamy), this should distance these couples and families from those where the male breadwinner/female homemaker model is the norm yet. Then, as Esping-Andersen (2009; 2016) suggests, the return-to-family trend is driven by the well-educated women and in particular in society that are adopting gender egalitarianism behaviours.

In fact, to some extent, educational attainments not only shape gender relationships within the couple, but also show a pattern where social inequalities maybe are reproduced or reduced.

This project tries to shed light on the relationship between fertility and women's education and labour market participation, observing if this gender revolution is creating, unexpectedly, a polarisation between and within countries.

Then, the necessity to compare different European countries, paying attention to differences and similarities among them in terms of women's educational level, labour market participation and fertility. In particular, the aim is to observe if and where the gender revolution is creating a "double" polarisation. On the one hand, between countries, because some European countries are more willing than others to adopt and accept gender equality norms. Welfare states that ensures high-quality child care and stimulate women's participation in labour market can contribute to the gender revolution, and to the conversion to a gender symmetric behaviour within couples. On the other hand, the other polarisation can be observed within countries: the less educated women are more at risk not only of lone motherhood, but they are also less likely to enter in the labour market; and if they do, usually have less protective jobs in terms of maternal leaves and wages.

Due to the fact the women's new role is a solution against child poverty (Esping-Andersen, 2016); the dualism of the female revolution can be a source that feeds polarisation because earnings, better jobs are concentrated in higher socio-economic classes.

In order to disentangle the relationships between education, employment, transition to motherhood and propensity to have a(nother) child we use data from Gender and

Generation Survey, both the first and second wave and *Famiglie e Soggetti Sociali* (for Italy), asking the following research questions:

1. How does education affect the transition to motherhood and higher order births? Is this effect creating a polarisation among different countries?
2. How does employment affect the transition to motherhood and higher order births? Does this effect differ across countries?

We decided to use GGS data and FSS data, because they are part of a wider program whose aim is to improve the knowledge of the macro and micro factors that affect the relationships between generations and between genders. The surveys deal with different topics, such as: fertility and partnership histories, the transition to adulthood, economic activity, care duties, and attitudes. They are the most recent available large-scale panel and internationally comparable demographic surveys available to date.

The main technique applied to answer our research question is event history analysis and its advancements. Event history analysis is an adequate method to study the events that occurred during the life history of an individual (e.g., enrolment in education, employment, union formation, migration, parenthood, and retirement); the occurrence of these events marks the transition from one state of the life course to another (Blossfeld *et al.*, 2007). In particular, we applied a flexible approach, the piecewise constant exponential model, that it is a simple generalization of the standard exponential model.

Structure of the thesis

We have divided this thesis into four chapters. Each chapter has its own introduction, theoretical background, data and methods, results, and discussion sections. At the end of the thesis, we have included the Appendix.

Overview of empirical chapters

Following sessions present a brief overview of each chapter, underlining the path that we followed and the main results that we obtained.

Chapter 1: Below replacement fertility: from low to lowest-low levels

In this chapter, we reconstruct the theoretical framework, observing the characteristics of lowest-low fertility with a focus on the factors that led to postponing syndrome. We propose an approach that present theories as if they are on a Cartesian plane, resulting from the intersection between, on the one hand, micro and macro level and, on the other hand, between economic and cultural level. Finally, since the goal is a comparison between countries, the conclusion of the chapter focuses on the European context in order to show how European countries adopt different interventions to impact on fertility.

Chapter 2: The effect of education on fertility: a cross country comparison

The aim of this chapter is to test micro-economic theories of the family, observing to which extent the relationship between education and fertility varies across countries. We contribute to the literature about the role of education in fertility by particularly focusing on the effect of educational attainment and distinguishing between transition to the first, second and third childbirth.

We use the GGS data both from first and second wave and FSS conducted in 2009, respectively on 15 and on 8 European countries (1950-1979 cohorts). We model the transition to first, second, and third births for women including a time-varying covariate, enrolled in education.

Finally, this chapter sheds light on the relationship between education and fertility behaviours testing in particular the opposite thesis of NHE and SDT on one side, and Gender Revolution on the other one. Observing that the results on the transition to the first child are more in line with the first explanations, that suggest a similar evolution toward “less family” scenario. Both transition to the second and to the third birth, by contrast, are more in line with Gender Revolution hypothesis. This revolution is probably at a more advantaged stage in Western European countries compared to Eastern ones, creating a polarisation for which more educated women experience higher fertility in the West, whereas lower educated couples have higher fertility in the East and this may lead to a widening of inequalities across European countries.

Chapter 3: The effect of employment on fertility: a cross country comparison

This Chapter aims to extend the literature about the effect of women's employment, including in the model another time-varying covariate: currently employed.
With GGS data from the second wave and FSS gathered in 2009, we model the transition to the first, second and childbirth on 8 countries.
This chapter sheds light on the relationship between employment and fertility behaviours observing in particular the opposite thesis found at macro level, about the fact that after the mid-80s, the association between employment and fertility changed from negative to positive. The result suggests a deeply difference across countries, opposing one the one hand post-socialist regimes and social democratic regimes and one the other hand, Southern European countries (represented in our sample only by Italy). In general, results regarding the transition to the first child suggest that post-socialist and social democratic regimes countries support working women; by contrast, in Italy the effect of employment is negative. Furthermore, findings on transition to second birth reveal that for working mothers is more difficult to combine work and childcare duties and therefore the risk of postponement is higher.

Chapter 4: Same effect but different future perspectives?: how women's employment affects fertility in Italy and Hungary

In this last chapter, we focus on Italian and Hungarian context. Based on the results obtained in Chapter 2 and Chapter 3, we examine in detail the relationship between work and fertility, observing both the interaction effect between employment and education and the interaction effect between employment and cohorts suggesting a strong difference in educational levels as well as between older and younger cohorts.
With GGS data from the second wave for Hungary and FSS gathered in 2009 for Italy, we model the transition to the first, second and childbirth on these two countries.
This chapter sheds light on the relationship between employment and fertility behaviours, starting from two observations: on the one hand, attitudes toward double income are more developed in Hungary than in Italy; on the other hand, however, fertility is recovering more rapidly in Italy than in Hungary. Furthermore, changes towards a gender egalitarianism society have been found among younger

cohorts in Italy; while findings in Hungary do not support this thesis. Then, to understand the difference between these two countries and more in general between Eastern and Western countries there should be a differentiation between attitudes towards double income and attitudes towards gender role. This distinction permits to explain results for which in Italy employed higher and younger educated women have a higher relative risk to become mother compared to their counterparts; while in Hungary tertiary educated women experience lower propensity.

These findings suggest that the positive effect of being employed on fertility among younger and educated cohorts in Italy is leading to a spread in gender egalitarianism. This revolution is probably at a more advantaged stage in Italy compared to Hungary, which is characterised by more traditional attitudes towards gender equity.

First Chapter

Below replacement fertility: from low to lowest-low levels

Introduction

In this chapter, we try to construct the theoretical framework. Fertility is a broad area of study in which multiple theoretical approaches coexist, coming from different disciplinary fields. For this reason, we focus on the main contributions, avoiding references to the disciplinary areas. We build a path that would explain why it is essential to study fertility by observing both causes and consequences of low fertility levels across European countries. In particular, we show the trends that characterise lowest-low fertility with a focus on the factors that led to postponing syndrome.

We present the theories as if they are on a continuum, identified by four "poles": micro/macro and material/ideal. The four quadrants of the Cartesian plane resulting from the intersection of these two dichotomies show four areas of theories: modernisation, rational choice, preferences and secularisation theories.

Finally, we conclude the chapter by focusing more on the European context since the goal is a comparison between countries. We show the institutional contexts that influence and shape the decisions of the actors involved. In particular, we observe how literature presents family policy measures and which policies impacting on fertility are adopted by European countries.

1.1 The emergence of lowest-low fertility

The global population is in a critical moment, and the majority of the world's population lives in countries or regions below-replacement fertility, and the distinction between developed and developing countries are disappearing in comparisons of fertility levels (Wilson 2001, 2004).

Fertility rates steadily decreased from the mid-1960s through the century in all European countries. However, at the beginning of the 2000s, the total fertility rate

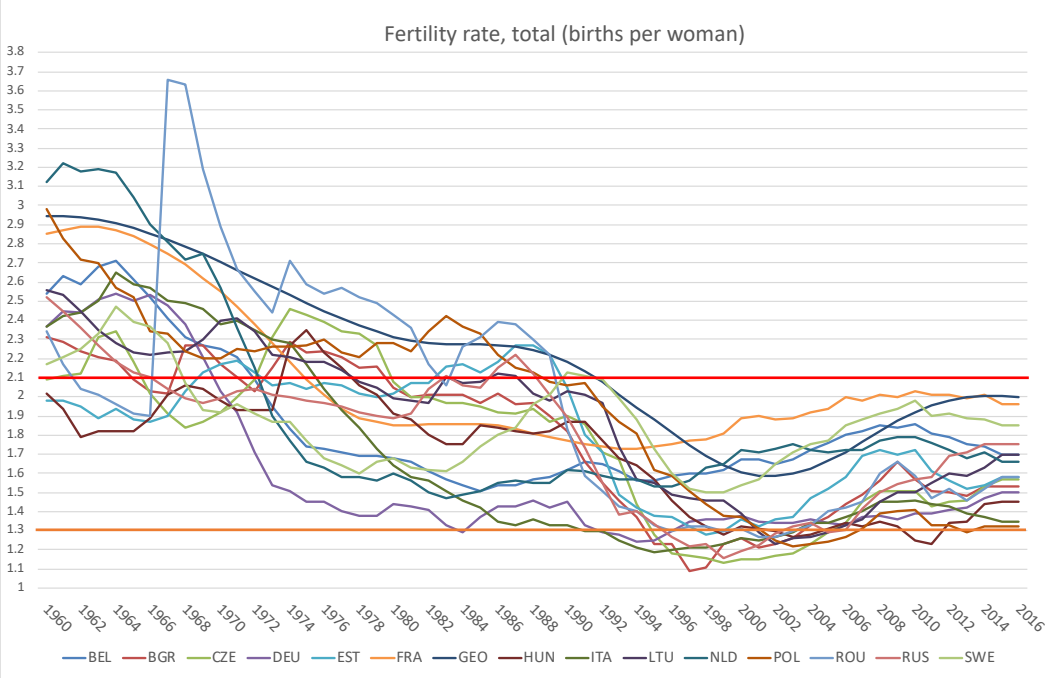
displayed signs of rising again. This development ended in 2010, and a subsequent decrease was observed through a relatively low in 2013, followed by a slight increase towards 2016.

Some aspects of this convergence towards low fertility are outlined. First, the spread of below-replacement fertility (below 2.1 per woman, in Graph 1 it is represented with the red line) to formerly high fertility countries has occurred faster than the convergence of many other socioeconomic characteristics. Second, the theory that fertility levels would stabilise close to the replacement level is no longer valid. Below-replacement fertility has become the norm, and Europe is going through a demographic change in the trend towards low and very low fertility that is unprecedented. Kohler and colleagues (2002) have labelled these patterns as lowest-low fertility to emphasise the dramatic implications of these unprecedentedly low levels of fertility. Furthermore, as a consequence of below-replacement fertility that has prevailed for several decades since the 1960s and 1970s, low birth rates in Europe have begun to generate negative population impulse, that is, a new force for population reduction over the coming decades due to the fact that past below-replacement fertility results in declining numbers of potential parents. Among the European countries, France reported the highest total fertility rate in 2016, with 1.92 live births per woman, followed by Sweden, with 1.85 live births per woman. By contrast, the lowest total fertility rates in 2016 were recorded in Italy (1.34 live births per woman). In most of the States, the total fertility rate declined considerably between 1980 and 2000–2003: by 2000, values had fallen below 1.30 in Bulgaria, the Czech Republic and Italy.

A continuation of this trend could substantially intensify the inevitable ageing of the population, reinforce a future decline in the population size and constrain the effectiveness of policy interventions intended at boosting the number of births. This demographic change, which has led to the birth of a number of children below the level of generational substitution, brings out the phenomenon of lowest-low fertility, defined as the level of total fertility rate below 1.3 children per women in some European countries (Kohler, Billari, Ortega, 2002; Billari, 2005).

As it is shown in Graph 1, there have been no cases of sustained lowest-low fertility before 1990 (orange line), with the exception of short periods (e.g. France during First World War, West Germany in 1984-85 and unified Germany in 1993-93). According to widely recognised estimates, Italy and Spain were the first countries

to cross the 1.3 line in 1993. Observing the 1.3 threshold for TFR is essential for the direct implications on population dynamics. In fact, if the TFR remains for a long time at or below 1.3, this indicates a decrease of the number of births by 50% each year and a halving of the population size in less than 45 years (Billari, 2005).



Graph 1 Fertility rate from World Bank Open Data. In particular, for Belgium, Bulgaria, the Czech Republic, Germany, Hungary, Italy, Lithuania, the Netherlands, Poland, Sweden: Eurostat; for Estonia: Eurostat, Statistical Office of Estonia; for France: Eurostat and United Nations World Population Prospects; for Georgia: United Nations World Population Prospects; for Russian Federation: Eurostat, Russian Federation Federal State Statistics Service, TransMonEE

1.1.1 Factors of the postponing syndrome

Billari (2005), analysing the phenomenon of low birth rate, in order to identify the causes, uses a keyword that is considered fundamental: to postpone. Indeed, the main steps for the formation of a new family unit are on the average progressively postponing. European citizens leave their parents' home, get married and become parents later, and some countries have been more involved than others in postponing the transition stages to adult life.

Mills, Rindfuss, McDonald and te Velde (2011) have identified some factors that imply a delay in becoming parents. The first reason is the spread of oral contraceptive methods since the 1960s. The so-called pill, in fact, has revolutionised the behaviour of women and has allowed them to invest more time

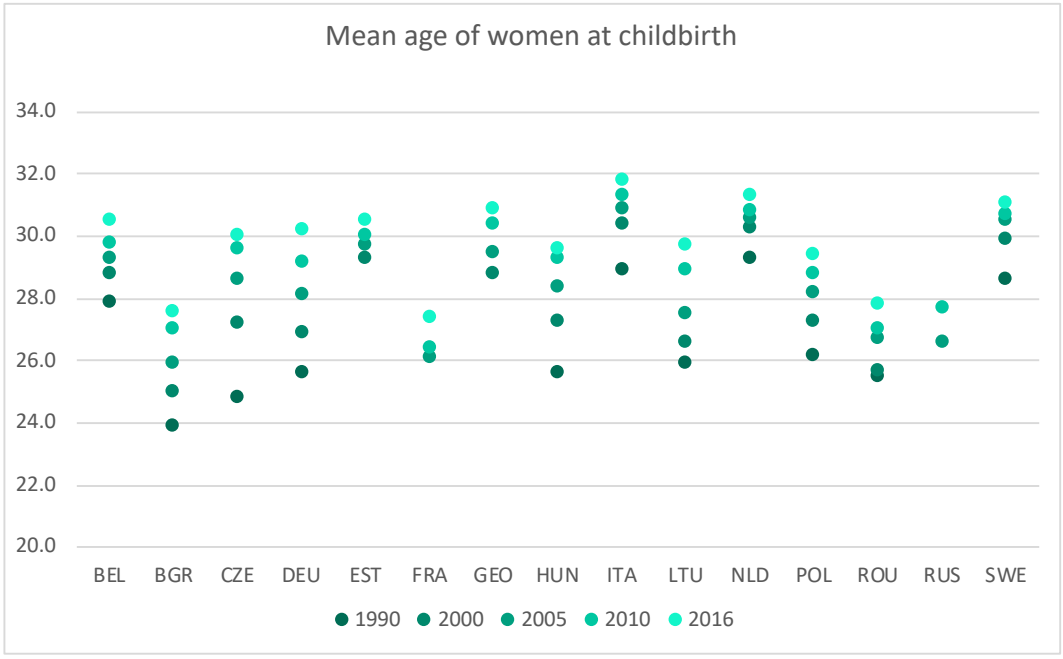
in careers, translating both in a delay of marriage and in helping to plan any births. Some studies (Spinelli *et al.*, 2000; Skouby, 2004) have shown that, in the countries of Northern and Western Europe, the use of oral contraception has spread more widely. However, as we outlined before, fertility has also decreased in Southern Europe countries, in which the diffusion of the oral contraception was slower (Dalla Zuanna *et al*., 2005), so other causes of cultural and social nature must have contributed to postponing parenting. A second reason, widely analysed in the literature (Rindfuss *et al.*, 1980; Becker, 1981; Blossfeld, Huinink, 1991), focuses on the increasing of female education. It has been noted that there is an inverse relationship between high levels of education and fertility: having a post-secondary or post-graduate university education versus the timing of conception of the first child. Multiple reasons explain the phenomenon: both roles (student and mother) are time intensive and conciliation, therefore, is very difficult. Moreover, women with a high education tend to pursue their job aspirations, taking step by step what lead them to undertake careers with more significant responsibilities and therefore greater involvement concerning time.

Some subsequent studies (Baizán, Martín-García, 2006; Martín-García, 2009; Van Bavel, 2010) have analysed how educational sectors influence fertility. Van Bavel (2010), in particular, showed four critical impacts on fertility: the expected salary, the steepness of the earning profile, the attitude towards gender roles and, finally, the gender composition of the sector of education chosen by women. The results indicate that women graduate in a traditionally male discipline tend to postpone the birth of their child; instead, women who have chosen a discipline considered more "feminine" are less inclined to postpone motherhood. High income and a higher expected salary are also associated with postponement of motherhood. In fact, women, who expect to receive a high salary at the entrance in the labour market, especially if the job is full-time, tend to postpone the transition to motherhood. Likewise, expecting a progressive increase in wages with the advancement of working age leads women to delay maternity (Van Bavel, 2010). Although often the challenge of women is to enter the labour market, and to return after going out or having reduced the time for a period.

In literature, regarding fertility, it is frequently to refer to the theoretical framework of the "Second Demographic Transition" (van de Kaa, 1987). The fundamental nucleus of this theory suggests that the decline in fertility rate since the 1960s in

Europe has been linked to a change in norms and values that has led to an alteration of birth and mortality patterns.

According to the Second Demographic Transition (Lesthaeghe, 1995; Lesthaeghe, van de Kaa 1986; van de Kaa, 1987), ideational changes have led to the emergence of "postmodern fertility preferences", including the postponement of childbearing in response to the increased emphasis on individual autonomy, the rejection of institutional control, the rise of values associated with the individual's satisfaction. The change that has spread in those years has restructured the traditional family-oriented approach, determining an individualistic one instead. This theory focuses more on cultural transformations and values, analysing how individual personal developmental desires have emerged in individuals and how other priorities have emerged, such as self-realisation in other spheres that are not just parenting, opening a range of choices. Also identifying as a greater awareness of the choices of motherhood has produced, over time, in modern society the choice of being part of a smaller family unit, preferably composed of two children. A related aspect is the different perception of the child's role, Liefbroer (2005) suggests that men and women are aware of the costs and benefits of being parents and, nowadays, they plan births, considering the drastic change that being a parent involves not only at an economic level, but also in terms of lifestyle and relationship with their partner. Furthermore, the postponement of family formation can lead to the renunciation of becoming parents (Livi Bacci, Salvini, 2000). This "postponing syndrome", in some countries, where formal childcare services are scarce, distributed not homogeneously on the territory and relatively expensive, increases because of the difficulty in reconciling work and life. In these countries, postponing syndrome inevitably leads to the phenomenon of empty cribs. In fact, there is clear evidence, at the individual level, that becoming parent later causes having a smaller number of children and the decreasing progression to second (especially), and third births is the critical factor that made these countries reach lowest-low level (Billari, 2005) (Graph 2).



Graph 2 Mean age of women at birth of first child (For Russia and Georgia we used data collected in 2006 instead of 2005 and data about 2016 for Germany and France are provisional). Source: Eurostat

The development and, above all, the persistence of lowest-low fertility have massive implications for the economies and the societies in which it takes place. A demographic implication that is commonly considered is the decline in population size, which is usually embedded in population forecasts (see, e.g. Kohler *et al.*, 2006). Furthermore, the persistence of lowest-low fertility is supposed to increase social problems rather than contribute to the advancement of modern societies, especially for the implied speed in population ageing.

1.2 Fertility: a proposal for a theoretical framework

There are many interpretative approaches regarding the demographic change, which has given rise to various inter-disciplinary debates seeing that they are often irreconcilable with each other.

Given the many approaches, from the crisis of the first demographic transition theory, no consensus has been reached on which aspects should be analysed to understand demographic change. However, some attempts at systematisation have been presented:

1. Bulatao (2001) proposes a cataloguing of the contributions on the basis of the disciplinary matrix;

2. van de Kaa (1996) supports the identification of a central theoretical core, supported by irrefutable assumptions;

3. Morgan and Taylor (2006) identify, instead, a common interpretative grid, formed by concepts found in all the contributions.

Every systematisation offers strengths and weaknesses because the fertility phenomenon is dynamic and multidimensional.

The first method, proposed by Bulatao (2001), provides a classification of each contribution according to the disciplinary criterion and typically it distinguishes seven approaches:

1. The demographic approach: it refers mainly to two distinct but related conceptual cores. The first one concerns the process of demographic transition and the second one refers to factors that determine the reduction of fertility.
2. The historical approach: changes in fertility are identified within specific historical and geographical contexts.
3. The economic approach: in which the cost of the children is the central element, intended primarily as a direct cost necessary to invest in the quality of the children and as an opportunity cost related to the mother's renunciation of participation in the labour market. Finally, as an indirect cost linked to changes in the modalities of intergenerational transfer of wealth.
4. The psychological approach: whose fundamental characteristic is the attention on the subjective dimension and on individual decision-making processes, through which identify personality configurations and intentions that are more or less inclined towards parenting.
5. The sociological approach: the elements considered focus on the relationship between processes of society transformation and changes in the dynamics of populations.
6. The institutional approach: the core is the idea that the approaches and timing of demographic changes are influenced by the institutions, understood as a set of socially constructed rules (and dependent on its historical development). Institutions provide solutions to the problems of its members and, therefore, directly influence the progress of fertility.

7. Gender approach: shifts the gaze to the dynamics of relationships between men and women, gender roles and the gender division of labour, considered as factors capable of affecting fertility choices.

The main strength of this disciplinary classifications is undoubtedly the clarity in the exposure of each approach, making it easy to identify every element of each contribution. However, not highlighting internal divergences and differences, it leads us to believe that theories belonging to the same disciplinary field are more similar and coherent. Furthermore, theories often do not belong to a single field but try to link multiple factors in different disciplines, making it difficult to attribute the analysis to one or the other approach.

The second method concerns the identification of a central reference point to which to anchor, more or less hierarchically, the other explanations. One of the most interesting systematizations is made by van de Kaa (1996). The author, through the introduction of the concept of anchored narratives, rearranges and coordinates the contributions developed within different perspectives and disciplinary orientations (Szołtysek, 2007). The central nucleus identified is the idea of change or transition. The projection on a temporal scale of the theoretical contributions, which tries to explain the changes in fertility, makes it possible to construct a complex network of sub-narratives, arranged on three levels according to the extent of their range of action and their potential generalisation. In van de Kaa's scheme, the theory of demographic transition, positioned at the first level, covers the role of initial theory that represents "the common knowledge of the world" and defines the general relationship between the processes of transformation of society in its three basic dimensions: culture, structure and technology, and changes in fertility. The sub-narratives, placed at the second level, interpret the change in society both from regulation and through the identification of indicators to compare different models of social, cultural and institutional development. The third level, the most specific, is composed of empirically verifiable models based on the idea of path dependence. The three levels are characterised by a high degree of interrelation and are part of a single process that identifies the factors of fertility change. Through the reconciliation between general and particular, between micro and macro, a single theoretical framework is created, composed of causal factors and mechanisms coming from different disciplinary fields. Indeed, this approach leads to the

exclusion of any criticism towards the central core (Szołtysek, 2007), that is the idea of transition, which is accepted as the assumption of progress, modernisation and technological civilisation, which have instead raised many interpretative doubts (Greenhalgh, 1996). The idea of a central nucleus is risky because it is too rigid to restore the dynamism of the phenomenon adequately.

The third method, proposed by Morgan and Taylor (2006), provides a cataloguing scheme based on the creation of two-dimensional conceptual space, within which the various contributions are positioned. On the first axis it is possible to identify three dimensions, called scopes, with respect to which the theory can be applied and considered valid: global, interactive, idiosyncratic; on the second axis there is the "content" theoretical dimensions, to which the changes in the fertility trend are traced. On the first axis, theories take into consideration general aspects that have the aim to capture theories across time and space. Instead, on the second axis, there are the categories of elements considered capable of predicting the change in fertility and are distinguished between the economic, ideological, institutional and technological changes to which a fifth explanation is added, defined synthetic/path-dependent explanations; this last element represents contributions, stressing the importance of multiple factors belonging to more than one category. The most obvious advantage of this method is undoubtedly its flexibility: the combination of concepts returns a two-dimensional picture, respecting the differences between theories, through their comparison. The main difficulty consists in being able to identify the most adequate and efficient dimensions, able to represent all the contributions to be classified. However, despite the difficulties and limits reported, a method of this type seems to be the most suitable to achieve a theoretical overview that crosses multiple disciplines.

1.2.1 The dichotomies: macro/micro and material/cultural

We, therefore, propose a theoretical model capable of classifying theories concerning fertility. To make the scheme comprehensible we have identified two classical dimensions to represent the theoretical contributions: individual/society, which identifies the micro and macro levels, and ideal/material, also called economic-cultural. Following the third method of approach we place the two pairs of dimensions on a Cartesian plane. In this way, we "build" a space formed by four quadrants within which the different theories are positioned (Figure 1).

Consequently, the theories are not classified according to their discipline, but only concerning their belonging to the intersection of these two dichotomies.

Regarding the first couple (micro/macro): we refer the macro level to all the phenomena that are part of a macrosocial approach. The theories at this level explain and analyse not the behaviours of individuals as such, but as belonging to a society at a particular moment in history. The causes and consequences of fertility are, therefore, imputable to factors present in the various cultural and social models. On the opposite pole, we find the concept "micro" that refers to theories that are oriented towards the aspects that concern individuals, moving the focus to the micro level. Individuals are considered actors that act in society and that modify their behaviour, not on an aggregate level, but based on preferences and attitudes internalised more or less consciously.

The second pair of elements chosen reflects another classic sociological dichotomy: the opposition between the material aspects, especially the economic ones, and the ideal aspects, in which culture plays a primary role. The dimension material is intended to indicate the factors that influence the living conditions of both an individual and the entire population, such as the possession of capital, goods and resources. These factors can cause a change in the fertility trend both at the aggregate level and at the individual level. On the contrary, we find the ideal factors, understood as values, attitudes, aspirations, which can lead to configurations more or less inclined to fertility. Through this element, we can explain why populations and individuals who have the same economic opportunities adopt very different reproductive behaviours.

According to this Cartesian plane, we analyse four fields of theories that emerge from the intersection of these two dichotomies.

To sum up, the four quadrants show four groups of theories:

1. The first quadrant, identified by the intersection between the macro and material factors, concerns the theories of modernisation. Fertility trends and causal factors are observed at the aggregate level. In general, it can be observed that every society has a specific set of material resources, which results in a specific demographic configuration and in a specific fertility trend. When a transformation takes place, which involves social and economic development, the balance changes, causing a reduction in fertility.

2. The second quadrant, derived from the intersection between the micro level and material factors, identifies the theories of rational choice. The fertility trend and the causal factors are analysed on an individual level and are determined by economic aspects of life. The choice of having a child is the result of the evaluation of costs and benefits performed by individuals starting from resources in their possession.
3. The third quadrant, identified by the intersection of the individual level and ideal factors, identifies the theories of preferences. The fertility trend and the causal factors are analysed at the micro level, but the focus is on the ideal and value aspects, considered central in defining behaviours. Each individual is characterised by a particular personality configuration, and the decision to have a child is the result of the "calculation" deriving from the conflict and the compromise between the desire for parenting (of both parents) and the renunciation of other aspirations. In this quadrant, we also find criticisms of various theories, especially demographic, which tend to explain only female behaviour.
4. The fourth quadrant, derived from the intersection between the macro and ideal factors, identifies the theory of secularisation. The fertility trend and the causal factors are observed at the aggregate level, analysed on the basis of the cultural and value aspects that predominate in each society. It is argued that collective representations define the importance of the family institution, encouraging or not fertility. The spread of secularised values makes parenthood a condition no longer necessary.

Although this classification fails to restore the complexity of the debate on the topic adequately, it effectively allows comparison of the various theories, avoiding the more classic use of a disciplinary matrix.

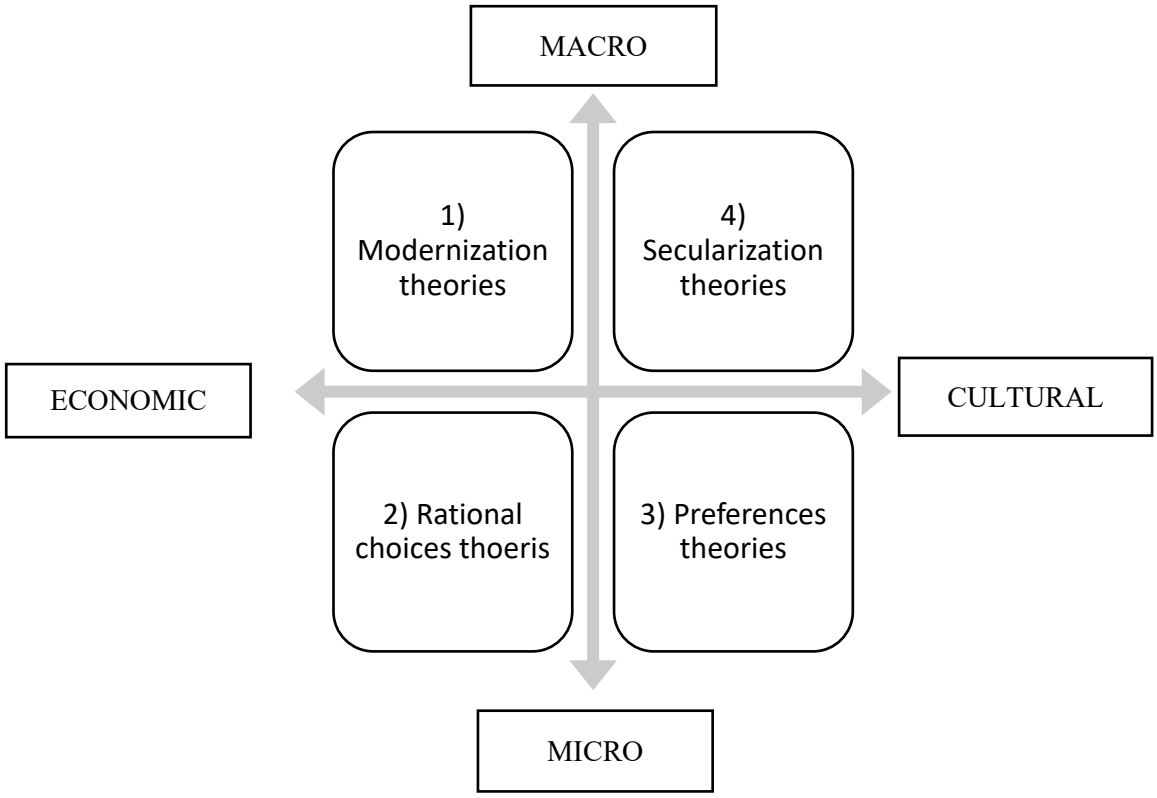


Figure 1 Theories identified by crossing two dichotomies: micro/macro level and cultural/material level

1.2.1.1 Modernization theories

The theories placed within the first quadrant share the general macro-economic perspective and the idea that life conditions of a society are the determining factor in the progress of fertility. For this reason, a change in these conditions causes a change also in fertility. The individuated process, capable of transforming the social productive structure, is the industrialisation that, involving all European countries since the mid-nineteenth century, has changed the structure of the societies: first founded on agriculture, now focuses on an intense process of urbanisation. In the context of a linear, universal and irreversible development, societies reach a threshold of modernisation that causes an economic change in becoming parents. In fact, the benefits of having a large number of children are transformed into a cost that is too difficult to sustain, and this starts a process of fertility reduction, which adapts to the new economic context. Notestein (1953) argues that economic progress decreases mortality improving living conditions, and, at the same time, urbanisation and industrialisation, requiring higher levels of competence, push

individuals to invest in their cultural capital, with the result of the decline in fertility. According to Notestein, urban life, increasing anonymity, reduce the pressure towards traditional behaviour exercised by the society and, at the same time, push individuals to higher and higher education, with the consequence that the cost of raising children compared to the benefit of having it is unbearable. Furthermore, the reduction in the mortality rate has increased the number of family members to be supported, further reducing the incentives to have other children.

The idea that the size of the population depends on the presence of sufficient livelihood goes back to the theory of Malthus (1798), for which an increase in economic well-being would produce, initially, a growth in fertility rates; later, however, saturating the available resources, it would bring back a situation of equilibrium.

Landry (1934), Davis (1945) and Notestein (1953) overturn the Malthusian assumptions and, starting from the observation of the simultaneity with which the phenomena of industrialisation, urbanisation and the consequent reduction of births occurred in Europe, support a different causal connection between development and fertility trend. Specifically, an inverse relationship is identified: in the first step, the modernisation of society reduces mortality and, subsequently, fertility rates. Three stages are identified, which follow each other in time: a phase of pre-transition, in which there is a balance between high mortality and high fertility; a transition phase, in which mortality declines but fertility rates are still high; and the third phase of post-transition, or the modern demographic balance, characterised by both low mortality and low fertility. The introduction of the term transition is commonly attributed to Notestein (Kirk, 1996), simultaneously with Davis (1945); while Landry (1934) prefer to qualify the three stages of transformation by labelling them in primitive, intermediate and contemporary. The main criticisms of these theories are related to the lack of empirical evidence and, above all, to their strongly Eurocentric and neo-colonial roots (Trigiglia, 2009). However, the idea of a close link between socio-economic aspects and demographic trends is also the basis of numerous subsequent studies. By eliminating the most radical nucleus that claimed that this evolutionary process was necessary and universal, the link between structural change and fertility is present in the theories of intergenerational wealth flows (Caldwell, 1976) and in Easterlin's relative deprivation (1976). Easterlin (1975), in particular, suggests the theory of relative economic deprivation, also

called “Easterlin hypothesis”, that explains how the fluctuations of fertility in the medium or medium-long term are influenced by expectations. These fluctuations, in fact, are due to the difference between the aspirations of lifestyle, which are formed during youth, and the present economic conditions. This difference, linked to the size of the birth cohort, determines the result in the labour market of that cohort. Large cohorts, in fact, can afford a smaller number of children than the smaller cohorts, because low wages do not allow individuals to have large families. According to Easterlin, the double action between the life’s aspirations and the resources which individuals have is summarised in the concept of “relative income”. The economic view, although not a determining factor in a couple’s decision to have children, influences future behaviour. Couples who have a high potential earning, concerning their aspirations, have a more optimistic perspective and feel freer to marry and have children. Two elements come into play: the earnings potential and the material aspirations of the couple. Regarding the first element, the individuals refer to the current situation of the labour market; the second factor, instead, concerns internalised aspirations, learned in an unintentional way, and they are the unconscious “product” of the environment in which individuals have grown, influenced above all by the economic circumstances of the family of origin. Relative income is therefore defined as the relationship between the couple’s earning potential and their aspirations and, if it increases, fertility also increases in parallel. According to Easterlin, women’s participation in the labour market is not the real cause of the decline in fertility, but both produce the reduction in relative income which is the real cause. In fact, women, who enter in the labour market because the relative male income is not sufficient to maintain the family, are forced to reallocate their time, moving it from the family to the market. Caldwell (1976), however, noting the limitations of the demographic transition model underlines the importance of demographic fluctuations instead of transitions and elaborates the theory of intergenerational wealth flows, integrating and modifying the classical perspective. He argues that there are two types of demographic regimes, defined by the fact that reducing fertility is beneficial or disadvantageous for families. If in traditional societies children contribute to family welfare, constituting a resource, in modern societies parents have to invest more and more resources in the care of their children, without a prospect of future return. Although it may seem that the choice is born on an individual level, in reality, the conditions

in which families are located depend on the society in which they live. In particular, the advent of mass education, the change in the organisation of work and the lesser collaboration of children in the domestic economy produce a lack of "economic return" for a child. In societies, where economic flows run exclusively from parents to children, children become a cost and are no longer a sign of wealth. Despite the coherence of theoretical reflection, the definition of flow and wealth makes it difficult to test this model empirically. McNicoll (1978, 1994), on the other hand, proposes to study demographic changes by relating them to the institutional and political environment, through a defined structuralist or institutional approach. Institutions define the environment and shape the courses of action of individuals. Underlining the contradictions of the theory of demographic transition and, in particular, the inability to understand how it is possible that different countries have had different transformations, McNicoll (1994) analyses the institutional settings of different societies and the way they are organised and, above all, the policies that governments adopt to increase or reduce fertility. Institutions cannot be considered independently from the social context in which they are embedded, and their current structure must be analysed according to the principle of path dependency, which contributes to building specific social situations and delimit the range of action of the individuals. In this way, McNicoll (1994) can explain not only how fecundity changes are realised, but also how there is not the same evolutionary process for each country. McDonald (2000a), on the other hand, analyses the reduction of fertility and the effectiveness of public policies concerning changes in the labour market at the end of the twentieth century and, speaking of post-modernisation, hypothesises the existence of a link between fertility and market deregulation. The processes of liberalisation of goods, markets and people, in fact, have allowed an increase in income, but have also an increase in the risks of poverty. In this situation of uncertainty, the most rational strategy for those who must preserve their work and acquire more skills is to postpone the formation of a family. The reduction in fertility can be amortised through social protection systems, which however are only partially implemented, precisely because we live in a context projected towards the market. The characteristics of the socio-economic environment and the institutional structures of a country play a fundamental role in determining the progress of fertility. MacInnes e Pérez Díaz (2009) suggest the advent of the third reproductive revolution in parallel with the economic and political one, which is

fundamental for modernity. The concept of the reproductive revolution, not only highlighting the limits of demographic transition theories but offers a better way to integrate sociology and demographics. Since the former has a tendency not to pay enough attention to the generational turnover of the population, mortality rates and fertility; while the latter, focusing more on the causes of the decline in fertility, underestimates and neglects the consequences of the historical change taking place. The reproductive revolution has made possible the decline of patriarchy, a feminisation of the public sphere, a change of the family, increasing the conception of identity and decreasing fertility rates.

1.2.1.2 Rational choices theories

Theories placed in the second quadrant focus on socio-economic processes concerning reproductive choices of individuals or, in rare cases, at a family level. The focus is on subjective evaluations and decisions regarding having a child, including different factors that are part of an individualist paradigm. Individuals have the responsibility of choice based on the rational criterion of balancing costs and benefits. Starting from the limits of the classical economic theories, unable to account for a multiple variety of reproductive behaviour and to have an empirical response, an increasing number of scientists, especially in the economic field, tried to explain the demographic dynamics through the key concepts of the micro-economy. They started by focusing on the processes of individual choice, moving from the assumption with respect to which having (another) child is the result of a decision-making process, through which a rational individual acts with the aim of maximising the expected utility. Microeconomic theories, however, have for a long time dominated the fertility research scene, placing themselves opposite to the theories of modernisation (quadrant 1, Figure 1), considered too generic. The first interpretation of micro-economic reproductive behaviour is attributed to Leibenstein (1957). He introduces the idea that the size of the family is the result of a conscious decision based on cost-benefit logic. Benefits from having a child are related not only to personal satisfaction, but also to a source in terms of work and income provided to the family. On the opposite side, the costs include both direct expenses such as food, clothing, education and indirect costs, related to the renunciation by parents to fulfil other activities. The main problem of a pure cost-benefit model lies in the fact that it leads to results that are not empirically validated:

in American and European societies there is no increase in the quantity of goods consumed as income increases. Families with higher incomes have fewer children than those with more modest incomes. In general, this contradiction is explained by assuming that the cost of the children and the expenses necessary to raise them are higher for the more affluent families and tend to grow more than proportionally concerning income, compared to the usefulness provided by having one (other) child who decreases as their number increases. However, according to Leibenstein, the necessary expenses for children increase a priori, regardless of the wishes of the parents. Therefore, the amount of the family unit's income would not be determined by the number of children, but by the cost that must be paid for each of them. This cost, moreover, cannot be under the control of the parents. Starting from the fact that no single aspect can offer a complete explanation, Leibenstein tries to integrate the microeconomic theory with the theories of modernisation and social influence between groups (Leibenstein, 1974). The cost and the marginal utility of the children would, therefore, vary according to the family economic condition because the increase in income would have modified the parents' preferences concerning the type of services necessary to raise a child. Each social group wants to achieve a particular lifestyle and families that belong to each of these groups are driven by both emulation and competition to reach the set standards. To achieve these goals, individuals use part of their income to acquire goods that express their status (Veblen, 1899). However, higher income groups have preferences that can demonstrate their higher status and that can ensure that there is no downward intergenerational mobility. These preferences, therefore, considerably compress the income and decrease the marginal utility of the children, making them a replaceable good and, consequently, reducing their number. Leibenstein (1974) takes into consideration some social factors and also focuses on the conflicts and dynamics that are generated within the family. However, this theory offers no empirical application and remains at a rather high level of abstraction, because it is difficult to test empirically. In the 1960s, the current of thought was born, known as New Home Economics, which explains the individual behaviour by analysing the decisions of rational choice and considers the costs and benefits of each action. Becker (1981), one of the most prominent representatives of this approach, shows how the number of children desired depends mainly on income, on the value of parents' time and the quality of the children (the expenditure for each child).

Becker, considering the Leibenstein's theory, reformulates its approach and creates a more general model. Assuming that individuals have fixed preferences and tend to maximise benefits and reduce costs, this model considers children to be a durable good and parents maximise their utility under the constraint of available resources. Children are an asset of investment that produces a flow of services over time, from which derives both their value, but also usefulness to parents. Like any durable good, they require an initial acquisition and periodic maintenance costs. Children, according to this theory, they are self-produced by the family itself through the use of time owned by parents (especially mothers) and goods and services purchased on the market. Through careful mathematical analysis, Becker (1981) shows that in developed countries the transition from high to low fertility was caused by economic growth and increased female education. Recently, Becker and Murphy (2000) have introduced social influences in this model, to be able to analyse how contextual changes affect individuals. For example, the behaviour of close people, such as friends and relatives, affects the number of children that individuals intend to have. Even Kohler (2001), moving in this more sociological approach, explains the fertility decision, adding social interactions to the mechanism. Kohler argues, in fact, that both in developed and developing countries the fertility rate depends not only on economic factors of maximising benefits, but also on the behaviour of other members of the population, thus affirming that a purely individualistic is not sufficient to explain the complexity of the phenomenon. Attitudes and values concerning fertility change through the social interaction of the local network and, in particular, this happens through two steps implemented by the network. The first, called social learning, indicates the mechanism through which information is known and the second, called social influence, the one through which values and attitudes of those participating in the network are modified. In this way, Kohler introduces a meso level of analysis and, linking individuals and context, integrates economic research with social research. These simplifications certainly provide clarity and have favoured the spread of microeconomic models; however, ease of application has also exposed such models to the risk of being used in a deterministic manner, without adequate theoretical references (Tilly, 1978; Hirshman, 1994).

1.2.1.3 Preferences theories

Theories of preferences shed light on the most intimate and personal aspects of choosing to have a child, focusing attention on the intra-individual dimension and deepening the role of subjective preferences, which shape the choice. In fact, the factors analysed are the motivations for parenting, preferences for a particular lifestyle and personal, professional and family aspirations. Having a child is the result of the process of evaluating desires and needs. Compared to the previous approaches, preference theories reject both the idea that individuals act homogeneously and the existence of a rational decision-making model, also bringing reproductive behaviour back to factors such as the value attributed to children regarding satisfaction rather than economic factors. Assuming that micro-economic approaches fail to explain different reproductive choices in families with the same characteristics, these theories focus on the value of children in decision-making processes. In this interpretative key, the decrease in fertility does not depend on a cost and benefit calculation, but on a change in the type of satisfaction, this involves in the decision of having a child. In current societies, parents expect from their children emotional and psychological rewards, not an economic contribution to family life (Fawcett, Arnold, 1973; Moors, Palomba, 1995). At the beginning of the seventies, a comparative survey was conducted, the Value of Children (VOC) project, to verify whether the modernisation has brought a change in the value of the children and whether this has influenced the progress of fertility. The survey was conducted through interviews and questionnaires on samples of parents residing in countries characterised by different socio-economic levels (Bulatao, 1979). The model hypothesises the existence of a relationship between the satisfaction provided by the children and family size. The indicators used are the parents' attitudes, the perception of satisfaction and cost linked to the children as well as future expectations (Fawcett, Arnold, 1973). These results should reveal the different trend of the relationship in the different countries. The promoters of the project, therefore, believe that reconstructing the motivations of having births in the different countries, starting from the distinct values attributed to children, allows them to explain the different trends in fertility (Bulatao, 1979). However, after being used in various investigations and producing a considerable amount of empirical results, the model is abandoned due to the inability to make sufficiently

general conclusions (de Bruijn, 2006). Basically, the explanations offered by the decision model centred on the "value of children for parents" cannot overcome the mechanism constituted by a subjective evaluation of the costs-benefits of fertility. This can ben intended as an individual assessment, completely detached from the external economic, social and cultural situation, but only filtered by parents' perceptions (Bulatao, 1979). The theory of planned behaviour elaborated by Fishbein and Ajzen (1975) describes human behaviour in different situations, and is wider and more attentive than the previous one. In this model, the intentions of having a child are an indicator of subsequent behaviours because it is believed that intentions allow not only to understand the motivations that lead to a certain action, but they also show the amount of effort that the individual makes to achieve this intention. In fact, it is argued that there is a positive relationship between the intention to commit an activity and the probability that this intention is fulfilled. It is important to analyse the perceptions that individuals have in respect to the success of the action they want to accomplish. The attitudes, evaluations and individual perceptions influence the behaviour of the subjects with constraints and opportunities; furthermore, internal subjective and social norms must be included in the analysis (Fishbein, Ajzen, 1975). It is possible to take into account not only individual factors; but also, the influence coming from the context, understood as a regulatory environment full of opportunities and constraints. However, placing the individual at the centre does not allow us to understand the context since the context is analysed only through the subjective perceptions of the actor and the constraints and incentives are not analysed (Bachrach, Morgan, 2011). The study developed by Miller (1992) seeks to fill the gaps in psychological studies. Reproductive behaviour is explained not through motivations, but through the analysis of personality traits that are internalised in the various stages of life. The experiences in childhood, adolescence and, later, in adult life lead to a positive or negative view of the idea of having a child; these experiences are transformed into desires and intentions and, finally, into behaviours. To explain the relationship between motivations and fertility choices, Miller argues that it is necessary to analyse the individual intra factors that precede motivations and to distinguish between motivations, desires and intentions. Motivations are part of a process that evolves throughout life. In childhood, Miller identifies the quality of the relationship established with the mother and the acquisition of values within the family. In fact,

children develop feelings of protection and care which originate motivations, only if they have had a certain relationship with their parents. During adolescence, we find secondary socialisation or experiences outside the family nucleus: first of all, the relationship with peers, which can strengthen or weaken the interest in having children. Finally, in adult life, multiple varieties of institutions contribute to establishing social norms related to fertility that would make the motivations to have children more or less strong. The motivations are translated into actions only after a series of transformations. In fact, when motivation arise, they are latent and unconscious, but with a powerful potential, for which, when they are activated and transformed into desires, they emerge at the conscious level. After an evaluating process, desires turn into intentions. Intention in conjunction with favourable external conditions originates the behaviour. From an empirical point of view, focusing attention on the intentions and the intra-individual processes is very difficult and there is the risk of excluding from the analysis all the extra-individual factors that, however, help to define not only the scenery of social relations, but also the perceptions and motivations themselves. The awareness of the risk of placing the individual at the centre and not capable to analyse the fertility choices at an empirical level, led Hakim (2000) to analyse the preferences of women for different lifestyles. The preference theory, introduced by Hakim (2000), in fact, offers an explanation to the different choices of women regarding the reconciliation between work and family and how these preferences influence the mother's behaviour concerning the labour market (Debacker, 2008; Streiber, Haas, 2009). Hakim's theory emphasises individual values and decision-making at the micro level. This theoretical framework shows how women face changes that have occurred both in society and in the labour market in the twentieth century. Hakim highlights, in particular, two epochal transformations: the contraceptive revolution and the struggle for equal opportunities. These changes have allowed the widening of choices and opportunities, creating three different women "profiles", which represent their lifestyle preferences:

1. Adaptive women, who prefer to reconcile work and family, without giving a priority to any of the two. This ideal type of woman performs the two activities at the same time or, in some life segments, one of the two prevails over the other. They are usually women sensitive to social policies and equal opportunities.

2. Job-centred women, oriented to the public sphere, who prefer to adapt family life to work life. Usually, even if in a stable couple situation, these women prefer not to have children and commit themselves to their professional careers, following with greater sensitivity economic and political conditions. They remain a minority, despite the diffusion of women, in the last decades, in highest occupations and in highest levels of education.
3. Family oriented women, who prefer the private sphere. They usually enter the labour market only if the family faces financial problems and, while investing in their education, prefer to use it as a cultural capital rather than turning it into economic capital. In Western countries, they are a minority.

Only the choices of adaptive women are conditioned by external events, by the surrounding context: however, the most numerous group of women moves between family and work, depending on how the circumstances change. On the contrary, the two groups at the poles pursue their goals and are not influenced by the situations that surround them. Hakim argues that preferences can be predicted by the behaviours implemented (in fact, they are proxies) and they are fixed and stable along the life course. If we observe the relationship between preferences and the choice of having a child, two important implications emerge:

1. Fertility does not diminish with the increase of women's social status of women, but it is said that high education influences women to be more career-oriented, respect that to the family. Lifestyle preferences are more important concerning the choice between work and family.
2. Public policies would be more effective in reducing the decline in fertility rates if they are adapted to women, because women are not a heterogeneous group. Family policies are usually focused on working mothers and ignore the profile of family-oriented women.

The main merit of the Hakim's theory lies in having, for the first time, underlined the existence of different lifestyles and the fact that women prefer a lifestyle to another, depending on the group to which they belong, and in the same group they share similar values and interests. Once identified the group to which every woman has chosen to belong, it is possible to reconstruct the progress of fertility in each society. However, preference theory has received much criticism from the method

chosen to identify groups. In fact, the classification is the result of an analysis carried out retrospectively, based on the National Longitudinal Surveys (NLS) survey data and on the assumption that women find themselves in a certain group at the time of the interview, sustaining that their choice accurately reflects their preference (Crompton, Harris, 1998). Proceeding in this way, it is not only impossible to elaborate an explanation of why a woman "prefers" or chooses one lifestyle rather than another, but also ignores the normative influences and structural constraints. The lifestyles defined by Hakim are not chosen by women, but they are often imposed or are the result of compromises due to the contingency of the moment; moreover, the definition of autonomy about motherhood does not consider either partners or opportunities in the world of work. Recognising the variability and heterogeneity of female choices, the theory of preferences, on the one hand, presupposes a freedom of action and a capacity for agency that is almost total; on the other hand, suggests that preferences are something of innate and constant over time. Presser (2001), analysing the effect of gender differences on fertility choices, explains the relationships that link the family system and the demographic processes, through the socio-psychological processes that link events at societal level to events at individual ones. Presser argues that women can control, by "timing", the events of their lives, concentrating the analysis on leisure time. Similarly, to Hakim's theory, the possibility of regulating fertility and planning births would change women's perception about labour market. Since the responsibility to raise a child often weighs on women, mothers have to compress their free time to the "disadvantage" of their children, even if they consider themselves entitled to it as much as their partners. Therefore, Presser argues that the management of time must be analysed to explain the reproductive trend. In fact, both most men and most women want to become parents (Presser, 1986), but when a child is born, men feel less obliged to renounce their free time to care their children. This is why women decide to limit the number of children, often having only one. This allow them not to renounce to be mothers, but at the same time avoid a drastically reduction of their leisure time (Presser, 2001). However, Presser's contribution fails to unite micro and macro level and underestimates the influences of the external context, which emerge only "filtered" by subjective perception. Moreover, some variables considered important are neglected by the analysis, such

as the degree of education that differentiates aspirations and preferences, that influence fertility behaviours.

1.2.1.4 Secularization theories

The theories included in the fourth quadrant, which intersects the social and ideal dimensions, are called theories of secularisation. These approaches collect a series of contributions and propose a perspective oriented to the change of the values in contemporary societies, overcoming not only the merely economic approach but also the one based on individual preferences. Through the analysis of the social and economic transformations of modern and post-modern countries and the focus on non-material factors, these theories explain the shift towards new values and ideals. Theories of secularisation consider the change in the value system that took place in the middle of the twentieth century as the main causal factor of the decrease in fertility. However, the attention to the ideal dimension leads many authors to underestimate both the role of material resources and individual factors, arguing that the acquisition of new values is essentially a passive and uniform process. The aim, however, is to overcome the gaps represented by the theories of modernisation, considered partial and incapable of capturing demographic dynamics (Hammel, 1990; van de Kaa, 2002). The need is to shed light on the transformations produced in the cultural and ideal field, since it is believed that the factors examined up to that moment have not been able to exhaustively examine both the demographic changes and the difference in fertility rates. For this reason, the studies try to incorporate the cultural variables, but they have difficulties in defining the concept of culture. The evaluation of the cultural context, included in the first investigations, has been empirically translated into the distinction between geographical region, ethnicity, language and religion with the addition of a macro concept that includes unexplained variance when other variables fail. Later, thanks to the link with anthropology, the cultural perspective is taking into account, focusing its attention on the analysis of networks and above all on the need to introduce elements that define the context, through mixed analysis techniques (qualitative and quantitative) (Kertzer, Fricke, 1997; Bernardi, Hutter, 2007). The new researches claim that the reduction of fertility is not due to the change in the desire of the parents nor the cost incurred to keep the children, but in the ideas that have caused the transformation, enhancing the freedom of individual choice and legitimating birth control. The best-

known contribution is undoubtedly represented by the theory of the Second Demographic Transition (Lesthaeghe, 1983; van de Kaa, 1987), which identifies the change in values within the framework of a broader transformation of ideas, that occurred in the transition from materialism to post-materialism society. Contemporary society promotes an ideology oriented towards personal self-fulfilment and emancipation from traditional models. The change in the cost-benefit structure (economic and non-economic) relative to the children would not, therefore, be sufficient to explain the reduction of contemporary fertility, but it would be attributable to the secularisation movement, since, in the absence of such change, the theorists argue fertility would remain relegated to the sphere of the "sacred", instead of entering into the sphere of individual choice. Ariès (1980) recalls two reasons for explaining the difference between the first and second demographic transition. In the first transition, the size of the family was reduced because the parents wanted to ensure greater well-being for their children (the era of the king son); therefore, it is due to an altruistic feeling. The second transition, on the other hand, is caused by a strongly selfish feeling, parents focus on their aspirations and on personal fulfilment, giving a minor part to the parenting role. In the second transition, moreover, the value of the family changes and passes from sacralization to desacralization. The institution of the family, considered solid and indissoluble, instead becomes weak. The greatest testimony of this phenomenon is the important growth of separations and divorces (van de Kaa, 2002). The decline in fertility below to the substitution threshold becomes the distinctive element of a transition not necessarily tending to demographic equilibrium and characterized rather by phenomena such as the progressive aging of populations, the increase in migrations, the accentuation of family instability, the increase of extramarital births, the increase in voluntary childlessness (Lesthaeghe, 2010). Even the theory of the Second Demographic Transition has received many critics: the first one concerns the distinction between two transitions, suggesting, instead they are simply two phases of the same process. Furthermore, a change in preferences and lifestyles cannot be necessarily a demographic transformation, which instead is a complete and irreversible process. In addition to this, it should not be labelled as "demographic" because the phenomenon regards the family unit and not the birth rate, mortality, migration and ageing of the population, elements typically recalled by demography. Moreover, some scholars argue that it is not even considered a

second transition, but rather a secondary one, because the elements of post-modernity, such as the increase in divorces, can be explained using classical theoretical frameworks (Coleman, 2004). In this line, a contribution proposed by Caldwell (2004) sees in contemporary family models the result of a transformation that lasts over time, begun with the diffusion of industrial production methods. In fact, in the various eras, there have been three ways of production: hunting and harvesting, sedentary agriculture and, subsequently, industrial production. Each characterised by its own social system model and its own rules. These models are transformed very slowly and partly survive even when the mode of production changes and, according to Caldwell, the second transition is part of a single transformation process, produced by economic, cultural and value changes. The main ones are the increase in education, employment and women's emancipation. The possibility of a "mismatch" between the mode of production and the social system can explain why there are very different contexts. In a patriarchal context, where there is a clear division of gender roles, characterized by high unemployment and a reduced gender sensitivity at the social level, women are stacked due to two forces acting in the opposite direction: the social obligations that belong to the past and the growing personal and professional aspirations that lead them to postpone and limit fertility. The gender theories focus on the dynamics of the relationship between man and woman because they consider them influential in the choices of having a child. Almost all the classical theories, in fact, completely ignored gender differences, subordinating women's preferences, interests and requests to men and relegating women to a mechanical and accessory role, depending on the partners' choices (Easterlin, 1976; Becker, 1981). One of the first studies is conducted by Chesnais (1996), which argues that the inability of men to accept equality between men and women in everyday practices induces women to reduce the number of children. In fact, even if it is becoming less legitimate at the verbal level, nothing has changed in behaviours and gender equity is far to be guaranteed. Two years later, Chesnais (1998) also theorises the so-called "feminist paradox": after an initial decline in births, the increase in equity in terms of paid work, but not in terms of female status, is the driving force for fertility. Chesnais outlines that the relationship between fertility and equity, in this way, can be represented by a U-shaped curve. In the same perspective of Chesnais's theory, there is the contribution of Mason (1995, 2001) who, clarifying the impact of the change of the female status

on fertility, supports the concept of "gender system" comprising both a gender stratification and the roles gender. Gender stratification means all institutionalised inequalities between male and female members in a given society and gender roles concerns the division of labour between men and women. The gender system is represented by multiple constructs: expectations and role divisions, the socio-economic characteristics of the subjects and the role of institutions (Mason, 1995). Moreover, the gender system is a transversal variable, able to modify how the other variables affect fertility in different societies: in fact, the power imbalances which exist within the various social domains (family, community, market and state) are interconnected and influence each other. McDonald (2000a; 2000b), in the theory of gender equity, distinguishes between an anti-birth effect of gender equity in high-birth contexts and pro natality, identified in societies characterised by low birth rates. The reduction of fertility, therefore, is not linked to gender equality but from how relationships between men and women are structured within each social environment. In fact, McDonald denies that there is the traditional inverse relationship for which greater female emancipation leads to low fertility. Moreover, equity is reached more quickly if institutions are oriented towards the individual and more slowly in family-oriented institutions, which consider women as individuals as part of a family model. In many countries, women have reached levels of education and employment rates similar to those of men; however, in the domestic sphere, they are still facing a strict division of tasks with their partners, that is deeply unbalanced and anchored to a patriarchal model. One way to achieve their professional aspirations and take advantage of the opportunities is, therefore, the choice to reduce the number of children. McDonald's contribution is particularly useful as it analyses some apparently paradoxical and totally inexplicable situations through the typical assumptions of the second demographic transition theory (McDonald, 2000b). In fact, since the '90s, the direct link between secularisation and fertility reduction has been criticised. Observing at empirical level that countries that are backward (from the point of view of changes in values) had lower fertility rates than countries where deinstitutionalization had turned the family structure, producing, for example, a greater incidence of divorces and separations. McDonald (2000a, 2006a) shows how, in general, the countries where the ideal model of the family is still centred on the male-breadwinner and female-caregiver division are those less equipped from the point of view of policies. This

also in terms of reconciliation and equal opportunities and therefore are those in which women notice the discrepancy between the status that they can get in the school and work environment and the role they have in their family and welfare systems. In these countries, institutions relate to individuals as members of a family unit and always respond to the logic of male-breadwinner model and, consequently, do not implement policies that promote female emancipation. In this line, Esping-Andersen (2009, 2016) underlines the connection between gender equity and family outcomes, suggesting that the revolution of women's roles is a boost for fertility. This theory, considering gender equity, suggests the idea that education is an important factor that affect fertility, observing that both the decline and the rebound in the level of fertility are driven by the same group: higher educated women, who are leading the revolution.

1.3 Family policies measures and cluster of countries

Population trends in recent years have stimulated most European countries to introduce or expand family support policies. The decline in fertility and, in particular, the number of children per family below the desired number declared in surveys pushed policy makers to reconsider family interventions. In fact, in the past, post-war welfare regimes across Europe built their social-policy arrangements under the assumption that the male-breadwinner family model was the norm and that mothers would be housewives and care for children (Esping-Andersen, 1999). Nowadays, this model has been outdated, and the dual-earner family model is becoming the norm (Mahon, 2002; Lewis, 2001), which is increasingly viewed as the standard in Western Europe and places emphasis on both parents as earners and caregivers (Mahon, 2002; Abrahamson, 2007; Leira, Saraceno, 2008).

However, family policies vary from one country to another. Some countries have long-standing family policies that have continuously developed ever since they were introduced to stabilise new risks for families. Other countries have introduced family policies more recently, and these consist of a various set of welfare measures. Countries also have different objectives, coming from support for fertility, support for the work/family balance, reducing inequality in living standards or diminishing family poverty.

In order to understand how policies react to demographic changes, several attempts have been made to provide classifications of welfare states and Esping-Andersen's "The Three Worlds of Welfare Capitalism" (1990) is the most prominent. This typology, however, has not remained undisputed, and several scholars have proposed alternative classifications (Leibfried, 1992; Castles, Mitchell, 1993; Ferrera, 1996; Bonoli, 1997; Arts, Gelissen, 2002; Scrugg, Allen, 2006). Feminist scholars have raised the necessity for an integration of a gender perspective into the analysis of welfare states. In particular, they have criticised the concept of de-commodification, suggesting that it does consider the different lifestyles that men and women can adopt and, overall, the fact that women provide the bulk of unpaid domestic labour and social care work (Orloff, 1993; Daly, 1994; Sainsbury, 1996). In particular, Orloff (1993) argues that two additional dimensions should be taken into account when considering the quality of social rights. The first dimension covers the degree to which women's labour market participation (or "the right to be commodified") is promoted or discouraged by the state. The second dimension refers to women's economic dependency and tries to explain the degree to which women can support their children without getting married to gain access to breadwinners' income. The work of Lewis and Ostner (1994) has provided a major step toward the inclusion of a gender perspective in the analysis of welfare states. The authors suggested an alternative categorization of welfare regimes based on the gender division of work, and they used the strength of the male-breadwinner/family-wage model as a proxy measure, dividing among "strong" (Great Britain and Germany), "moderate" (France), and "weak" (Denmark) male-breadwinner model countries. Sainsbury (1994) provides an alternative approach, classifying the "male- breadwinner" and the "individual" model as the two poles of a continuum. In the breadwinner model, there is a strict division of labour between husband and wife; in the individual model, partners share the tasks of financial support and childcare. Gornick and colleagues (1997) classify family policies focusing on policies that support mothers' employment. The authors distinguish three different age groups speaking about mothers' employment with children: those from birth to the age of three, three to school age, and school-aged children; considering benefits for new parents, childcare services, and public-school policies. Concerning policies aimed at children under age six, the findings suggest that there are three country groups. The countries with the most supportive policies are France

and the three Nordic countries (Finland, Denmark, and Sweden), followed by Belgium and Italy. The second group consists of five countries: Luxembourg, Germany, Canada, the Netherlands, and Norway. The least-supportive countries for this age group are the three English-speaking countries: Australia, the United Kingdom, and the United States. Korpi (2000) adds another approach, considering the relevance of policy institutions in shaping gender relations and agency. In his theory, family-policy institutions can be placed along two dimensions, depending on whether they support the traditional family or a dual-earner family. The first one, on the one hand, maintains a traditional division of paid work and care work between men and women and within society. In this family type, the male partner is the main earner, and the woman is mainly responsible for childcare. Dual-earner support, on the other hand, is oriented toward mothers' participation in both labour-market careers and in care work at home. On the basis of these two dimensions, Korpi observes the following three ideal-typical models of family-policy strategies: a "general family support model", a "dual-earner support model", and finally a "market-oriented family-policy model". Based on this typology, Ferrarini (2006) studies family policy developments from 1950 to 2000. He considers maternity insurance, dual-parental insurance, and paternity insurance into consideration to capture dual-earner support. The family-support dimension is captured using childcare leave, child benefits, marriage subsidies, and maternity grants. Calculating generosity of support per dimension in per cent of the national average-production-worker's wages, Ferrarini's results support the distinction among the three policy models. Austria, Belgium, France, Germany, Ireland, Italy, and the Netherlands are grouped into the "general family policy model," while Denmark, Finland, Norway, and Sweden belong to the "dual-earner family policy model." The third cluster, the "market-oriented family-policy model," includes Australia, Canada, Japan, the United Kingdom, and the United States, which have less-developed family policies along both dimensions. Furthermore, Ferrarini adds a fourth group that could potentially exist, labelled "contradictory family policy model". This model reflects a situation of institutional pluralism with high support for both the traditional family and the dual-earner family. However, this model was not identified in the original typology (Korpi 2000) or in Ferrarini's study. Based on family-policy classifications or single family-policy indicators, several comparative studies have confirmed the positive impact of policies supporting the

dual-earner model of the family. Measures promoting the dual-earner model are positively associated with female labour-market participation (Ferrarini, 2006; Kangas, Rostgaard, 2007), fertility (Ferrarini, 2006; Sleebos, 2003), and egalitarian gender-role attitudes (Sjöberg, 2004; Ferrarini, 2006), as well as lower rates of child poverty and increased child well-being (Bradshaw, Finch, 2002; Kamerman *et al.*, 2003).

One of the latest contributions that try to estimate the impact of family policies on fertility trends in developed countries is conducted by Luci-Greulich and Thévenon (2013). They use five family policy measures implemented in 18 OECD countries, for which information is available over the years 1982–2007:

1. Spending per birth, including maternity, paternity, parental leave benefits and birth grants
2. Spending on cash benefits per child under age 20
3. Spending on childcare services per child under age three
4. The number of paid leave weeks
5. Childcare enrolment of children under age three

The results show that OECD countries have considerably increased their expenditures to support families over the past decades. All types of support have been expanded to some extent: in-cash transfers towards families with children have been increased in many countries since the early 1980s, but the relative share of GDP per capita invested per child has grown at a slower rate since the mid 1990s or has decreased in some countries. However, differences still exist across countries in the way policies are mixed to provide support to families. Differences especially concern the extent and form of support provided to working parents with children under age three (Thévenon, 2011). In particular, Nordic countries are characterised by substantial help to combine work and family for parents with children under age 3. In 2005, expenditure per child on maternity and parental leave was much higher in all Nordic countries than elsewhere, mainly because parents on leave receive higher compensation, although the overall duration of paid and unpaid leave is relatively limited (except in Finland and Norway).

By contrast, Southern European countries are characterised by a "deficit" of policies. In fact, they have a short period of paid child-related leave and less extensive provision of childcare services. In particular, the period of full-time-

equivalent leave is insufficient and there is not fathers' specific entitlement to parental or paternity leave, these rights cover only "regular" workers. Furthermore, the provision of childcare services for children under preschool age is also quite low, but the net cost paid by parents is also comparatively low. This balance between limited assistance and low tax rates on the transition to work encourages parents to combine work and family life and, furthermore, dual earners households have tax advantages. The importance of work-related earnings is understandable in a context where economic need remains a driver of parental participation in the labour market.

This contribution also has the value of considering the Eastern European countries. This group is not homogenous and, although these countries have all experienced a transition to a market economy in the last two decades, family policies implemented vary widely among states. In the early years of this transition, the main guideline for organising family allowances was the principle of universality, with the aim of balancing for the loss of job security and wage subsidies that characterised the former system. However, policies are characterised by less emphasis on enabling women to combine motherhood with paid work (Rostgaard, 2004). As a result, the development of family and childcare policies has followed both different timing and patterns (Szelewa, Polakowski, 2008). In general, total expenditure on both in-cash and in-kind support is lower in Eastern European countries than in the Southern European countries. However, Hungary differs from the other countries, because it offers much more comprehensive support to parents with young children: in fact, parental leave payments are higher. The last group represented by Continental European countries lie in an intermediate position between the patterns described above. Although reforms have been introduced in recent years, the model of one-earner families continues to shape part of the institutional setting, and their policy strategies are more complex. In fact, these countries are heterogeneous concerning leave entitlements and care service provision. In all of them, the full-time-equivalent period of leave is on average, but entitlements differ across countries. Austria, Belgium, France provide a long period of leave paid at a fixed rate. In the Netherlands, leave is shorter, taken on a part-time basis and unpaid. Germany is the only country where leave was transformed from a flat rate payment for a long leave period to a short, well-paid period. Families traditionally benefit from explicit support in these countries, in particular, high levels of transfers to

family. This support to families is "traditional": in fact, the aims to transfers is to balance the child cost. Additionally, differences in childcare policies are also considerable, although investment in childcare services is slightly higher here than the average. Investment in childcare services for children under 3 is much higher in France than in the other countries. There are also differences in both coverage and intensity of use, which are higher in Belgium and France. In particular, France stands out among this group; its position is closer to the Nordic countries than to Continental one. In fact, transfers to families are comparatively high in order to help households to compensate the cost of children; working parents receive additional support either to care for children at home or to work; however, the incentive to work is limited by the lower tax rates for one-earner families compared to two-earner families. In general, to sum up, we can observe that even though most member countries have increased their support to families, for some countries, the development of these policies is quite recent and represents a change in orientation of the welfare state. The reconciliation of work and family life has often been a criterion in this development, but there are still major differences in the way this criterion is combined with and balanced against other family policy objectives. The main differences concern the level of support for working parents with children under preschool age and the extent to which parental leave entitlements and provision of childcare services complement each other. In part, this cross-country variation might reflect different stages of policy development. Thévenon's analysis (2011) does not strictly reproduce the categories of countries derived from the well-established classification of welfare state regimes or from previous cross-country comparisons of family policies (Gornick *et al.*, 1997; Gauthier, 2002), because some countries reform family-support policy in recent decades and have switched to more mixed forms of support.

1.3.1 The impact of family policies on fertility

The potential impact of family policies on fertility, in particular, the economic determinants are deeply studied in literature, and the effects are ambiguous. The first factor is the increase in income: on the one hand, an increase in income can balance the budget constraint that may prevent individuals from having a child. So, there is this "positive income effect", and children become "more affordable"

(Becker, 1960). On the other hand, when income increases it may also grow individual investments in human capital and families may opt to have fewer children, as to provide them with a higher level of human capital, preferring "quality to quantity" (Barro, Becker, 1989; Doepke, 2004). Furthermore, economic growth is also likely to increase women's education and wages (Galor, Weil, 1996). Women might thus substitute childrearing against market labour participation due to increasing opportunity costs of staying at home. Consequently, higher wage earnings for women can be a causal factor of fertility decline (Blossfeld, Rohwer, 1995; Hotz *et al.*, 1997). The fertility decrease occurs more when the possibility to substitute maternal care for goods or obtained services is restricted. Family policies potentially contribute to re-increases fertility when they can reduce the costs of fertility, both in monetary and opportunity costs terms. In developed countries, GDP per capita boost might be associated with fertility increment because parents can accept the costs of children more easily and States are also more likely to invest in family policies such as public childcare structures, childcare subsidies, and parental leave. This prediction meets the empirical findings that economic development (or income increase) reduces fertility only up to a certain point. Beyond a certain GDP level, further economic development stimulates a slight increase in fertility rates (Myrskylä *et al.*, 2009). Luci and Thévenon (2010) show that the fertility rebound, which can be observed even after controlling for birth postponement, has been steeper in those developed countries where women's labour market participation has also risen significantly over the last decades. This suggests that the impact of economic development on fertility can be positive if accompanied by better opportunities for women to combine work with family life (Ahn, Mira, 2002; D'Addio, Mira d'Ercole, 2005; OECD, 2011). Thus, fertility trends are likely to depend on the extent to which family policies help households to combine work and family life. These policies support families' standard of living, help parents to cope with work and care responsibilities, and may thus help parents to realise their fertility intentions. On the one hand, family policies are able to reduce the direct costs of children (housing, education) with the help of financial transfers. On the other hand, policies that help parents to combine work with childbearing (through childcare services and parental leave) reduce the indirect costs of children caused by forgone wage opportunities (Willis, 1973; Hotz *et al.*, 1997). Consequently, in a context of increasing aggregate income coming hand in

hand with increasing women's emancipation (especially in terms of labour market participation), employment-protected leave entitlements after childbirth and public childcare services are likely to play a key role in re-increasing fertility rates (Rindfuss *et al.*, 2010; McDonald, 2006a). These work-life balance policies can encourage mothers to continue working, encourage fathers to take a parental leave and stimulate parents to share their family roles (Gregory, Miller, 2008). Finally, these policies have a strong potential to reduce the gender wage gap. By this means, work-life balance policies are able to reduce opportunity costs for women, which can encourage fertility (OECD, 2011).

1.3.2 Which demographic characteristics make individuals more sensitive to family policies?

The aim of this section is to discuss in broad terms which demographic characteristics are expected to be more sensitive to family policies and to support the provision of childcare services. Of course, the first "group" is composed of families, because they are directly affected by policies. In particular, women are expected to be more in favour of public support than men. This gender difference is due to the fact that women are the bulk of unpaid care work and childcare (Svallfors, 1997; Gelissen, 2000). Regarding birth cohorts, it is observed that younger generations are more supportive of a strong role of the State as well as less satisfied compared with older generations. This idea is in line with research on gender-role attitudes which has shown that younger persons hold more liberal gender-role positions compared with older persons (Bolzendahl, Myers 2004; Crompton *et al.*, 2005). Another critical factor to examine is education: it is observed that higher educated individuals are assumed to be more supportive of government intervention for families. Here again, a particular focus is on highly educated women, who can be expected to have a stronger labour-market attachment and thus be in need of parental leave arrangements and public childcare services in order to combine work and family life. Furthermore, several studies support the idea that more highly educated individuals have more egalitarian gender-role attitudes (Crompton *et al.*, 2005, Esping-Andersen, 2009). By contrast, high-income groups are expected to be less supportive of family policies because they are less dependent on public interventions, especially in terms of financial benefits. Lower-income households, instead, are particularly in need of public childcare

services due to their lack of financial means to obtain private solutions (Mischke, 2014). Moreover, the labour-market participation of both parents is often an economic necessity among low-income groups, which might increase their support for public policies, such as public childcare services (Lewis *et al.*, 2008). More in general, the employment status is sensitive to public support for families in terms of childcare services or employment protection, especially for dual-earners couples.

Second Chapter

The effect of education on fertility: a cross country comparison

Introduction

In many Western and Eastern European countries, the number of highly educated women reaching the reproductive ages has been exceeding the number of highly educated men in recent decades (Vincent-Lancrin, 2008). Given the many linkages between education and family behaviour, this may have important consequences for fertility (Van Bavel, 2012). General and consistent findings relate to the postponement of parenthood and low total fertility rates due to the expansion of higher education especially among women (Sobotka, 2004; Ní Bhrolcháin, Beaujouan, 2012; Basten *et al.*, 2014). This is a crucial element both in the New Home Economics theory (Becker, 1965, 1981) and in the Second Demographic Transition (van de Kaa, 1987; Lesthaeghe, 1995). In fact, both theories predict a negative association between fertility and education. However, more recently two theoretical approaches – the multiple equilibria framework and the Gender Revolution Theory – have emphasised the role of gender egalitarianism both in society and within households as a boost for fertility. In particular, both frameworks have highlighted that the negative relationship between education and women's fertility is weakening and, in some contexts, it is even turning positive (Esping-Andersen, Billari 2015; Goldscheider *et al.,* 2015). The diffusion of the dual-earner family, which is substituting the male-breadwinner family model, are leading to a change for both women and men. On the one hand, women are expected to contribute to the household income through activity in the paid labour market; on the other hand, men are more involved in household chores and childcare.

Moreover, the aim of this chapter is to evaluate the effect of education on the fertility choices of women born between 1940 and 1979, using data from the Generation and Gender surveys both the first and the second wave and *Famiglie e*

Soggetti Sociali for Italy. To analyse the effect of educational attainment, we have estimated piecewise exponential models on the progression to first, second and third birth among first and second-time mothers.
In particular, we have tested two opposite explanations: New Home Economics theory and Second Demographic Transition theory and its development on one side, and Gender Revolution on the other one.

Our results show that the role of education on fertility behaviours not only remains important but also tends to have an increasing relevance among younger cohorts. Furthermore, on the one hand, a higher proportion of highly educated women postpone first childbirth or remains childless; on the other hand, among those who decide to become mothers, we found a positive effect of higher education on the propensity to have a second child; a result that can be interpreted in terms of a time-squeeze effect among tertiary educated women. However, relevant countries differences emerge relating to the effect of higher education both on becoming mother and having the second and third child. In particular, this positive effect is relevant in Western Europe countries, while remains a negative effect in Eastern Europe ones. To summarise, the result on the transition to the first child are more in line with Becker's and van de Kaa's explanations, that suggest a similar evolution towards an erosion of family. While, transition to second and third birth, by contrast, is more in line with Gender Revolution hypothesis.

The sections of the chapter are organised as follows. In Sect. 2.1 we introduce and discuss the theoretical background related to the education–fertility nexus in the literature and we formulate our research hypotheses. In Sect. 2.2 we describe data and methods used in our analysis. In Sect. 2.3 we show the result of our models about the transition to first, second and third child both for first and second wave. Focusing also on the interaction effects between education and woman's age at previous childbirth and between education and cohorts. In Sect. 2.4, we provide some concluding remarks and discuss potential directions for future research.

2.1 Education and fertility

The link between education and fertility has been interest of research in family demography, since education is considered an important *indirect* determinant of

fertility behaviour (Bongaarts, 1978). Furthermore, education has ambivalent aspects: it is strongly associated with occupational success and also reflects cultural resources that influence individuals' preferences for specific partners and family pathways in general (Basu, 2002; Blossfeld, Timm, 2003). Studies in family demography have focused on the relationship between education and fertility. In fact, the debate on the links between higher education and fertility is very rich and the literature provides explanations for both positive and negative associations. If we consider educational attainment as a proxy for social status and income (Impicciatore, Dalla Zuanna, 2016), the positive association — also known as "income effect" — can be interpreted following a Malthusian and/or an evolutionary perspective (see Chapter 1) and higher social class couples would have more children because they have better chances of raising them. On the one hand, in fact, the lower fertility among poorer classes would decrease the burden of sustaining offspring and increase the chances of survival for themselves and their children. On the other hand, higher fertility would reinforce the upper class, increasing the probability of offspring survival and cohort replacement (Skirbekk, 2008). Skirbekk (2008) suggests that before the fertility transition there was a clear positive relation between social status and number of children. With the demographic transition characterised both by the decline in infant mortality and the decrease in fertility, that had an effect on higher social classes, a negative or neutral status-fertility relation emerged. The negative association between social status and fertility would be encouraged by the increasing opportunity costs with income and social status. The New Home Economics theory (Becker, 1965, 1981) outlines the strong difference in gender's role in the post-war nuclear family in Western societies, with the male as the breadwinner and the female as the homemaker and caretaker. In line with Becker's theory, this model is showed as the most efficient in the organization of the gender roles. However, when women started to improve their educational attainments and increased their labour market participation, this model was no longer the norm. In fact, the most educated women who have access to better paid jobs would find it costly to be absent from the labour market (Becker, Lewis, 1973). At the same time, a couple with a higher socio-economic status would find more difficult to achieve opportunities for their many children, as the one to gain at least their same status (Dalla Zuanna, Tanturri, 2007). A different perspective is given by the Second Demographic Transition theory (van de Kaa,

1987; Lesthaeghe, 1995), which emphasises the role of a cultural shift occurred in Western societies towards a more individualistic lifestyle and the spread of post-materialist value orientation. According to this theory, having children is one among different possible choices and the preference to have a(nother) child becomes weaker as education increases. This leads to the expectation that the highly educated people are more likely to be forerunner of the demographic change (Lesthaeghe, Surkyn 1988).

However, in order to disentangle the complex link between education and fertility we have to distinguish between the effect of enrolment in education and attainment (Lappegård, Rønsen, 2005, Kravdal, 2007). Several studies suggest that low fertility during educational enrolment may due to the difficulty of reconciling life and work and, moreover, both to a lack in economic resources and to social norms that discourage parents to have a child before finishing their education career (Hoem, 1986; Blossfeld, Huinink, 1991; Ní Bhrolcháin, Beaujouan, 2012; Thalberg, 2013). Furthermore, a long enrolled in education period can lead to a lower probability of eventual childbirth, because of the shortening of the potential fertility window, when having children is feasible (Lappegård, Rønsen, 2005). The general postponement of parenthood is associated to higher probability to remain childless, especially for women. Given that the higher educated women leave school later than those with shorter educational enrolment periods, there may be higher fertility among those with higher educational attainment net of enrolment because of biological pressure on women to have children before the reduction in fecundity (Kravdal, 2001; Kravdal, 2007). This may be reflected not only in the intensity of having the first child after finishing education, but also in the timing of subsequent children (Bartus *et al.,* 2013; Kreyenfeld, 2002). Likewise, some research suggest that social norms dissuade women to have children at higher ages (Billari *et al.*, 2011; Rindfuss, Bumpass, 1976).

As we outlined, the starting point in studying the relationship between education and fertility is the micro-economic perspective. In line with these theories, individuals behave rationally and the demand for children increases with higher income levels (Becker, 1993). In fact, Becker's theory of fertility is a basic demand model applied to family decision making (Becker, 1960; 1981). Here the demand for children should rise in tandem with income and the relative cost of an additional child will decline. Though, this positive effect may be cancelled for two reasons:

the first one, the family's demand function depends on the price of having children relative to other goods, and parents could prefer other goods. The second one relates to individuals' earnings: as people's earnings increase so do the opportunity costs associated with having children (for example, kids are time demanding); moreover, the perceived opportunity costs are especially high for people with strong potential earnings, like highly educated people. The result is a shift in demand way from children. With this theory, Becker suggests that the utility of the households is maximised when there is the male breadwinner/homemaker and caretaker model. The specialisation model has been criticised for being too risky as a strategy for maximising household utility (Oppenheimer, 1997). For example, in case of an accident or illness, he/she cannot achieve his/her task and the utility of the household is not maximised. From the economic perspective, it is relevant also the interaction between quality and quantity of the number of children (Becker, 1993; Becker, Lewis, 1973). This interaction concerns the trade-off between quantity and quality, based on the assumption that higher income levels may not necessarily lead to having more children, but rather to having children of higher quality. In line with this approach, quality is preferred to quantity in particular by highly educated couples that reduce fertility to ensure higher life standards to their children. However, to understand the effect of education on fertility we have to consider other factors that can be linked with education. In fact, education reflects values and orientations that affect decision-making. The Second Demographic Transition (van de Kaa, 1987; Lesthaeghe, 1995), observing the decreasing in fertility rates, suggest that the shift towards this drop in fertility to below the replacement levels is accompanied with voluntary childlessness, postponed marriage and the spread of co-habitation. They interpreted this change mentioning the diffusion of values that promotes individualistic life-style orientations and identity-seeking. Higher educated people can be the forerunner group of this shift, because they can easily adopt new cultural values in their behaviours.

Furthermore, to better understand the link between education and fertility, we need to distinguish between birth orders. In literature there is a general consensus about the positive effect of higher education on the postponement of the propensity to become mother both at macro-level (Wilkie, 1981; Rindfuss *et al.*, 1996; Kohler *et al.*, 2002) and at micro-level (Ermisch, Ogawa, 1994; Bloemen, Kalwij, 2001; Billari, Philipov, 2004; Nicoletti, Tanturri, 2005). The postponement of

motherhood is often associated with a higher risk of remaining childless (Kneale, Joshi, 2008; Schmidt *et al.*, 2012). Besides, having the first child at higher mean age and remaining childless is more common among highly educated women (Keizer *et al.*, 2008; Kneale, Joshi, 2008; Kreyenfeld, Konietzka, 2008; Barthold *et al.*, 2012; Hopcroft, 2015).

However, if we observe higher parities, previous researches show contradictory results and countries present stronger differences. In general, it is outlined that the postponement of parenthood also tends to relate to fertility after the first child, mainly due to biological constraints on childbearing among women (Leridon, Slama, 2008; Schmidt *et al.*, 2012). This positive educational gradient on the transition to second and third birth cannot be explained either resorting to New Households Economic theory or to Second Demographic Transition explanation. In fact, as we outlined before, the former suggests that efficiency is guaranteed by skill complementarities and task specialisation within couples. If women pursue their careers, the opportunity cost of motherhood is not sustainable anymore and, in short, the erosion of family is due to women's pursuit employment. The latter observes the spread of postmodern values and underlines that these new values erode the traditional views of family and promote more individualistic life-style options. These two approaches seem different, but they suggest a similar evolution toward a "less family" scenario, characterized by fewer marriages and children and greater couple instability.

Nonetheless, empirical evidences seem to contradict there two theoretical foundations: in fact, fertility rate is now positively associated with economic development and income (Ahn, Mira, 2002; Sleebos, 2003; Myrskylä, *et al.*, 2009), considered proxy of education. Due to these premises, how can we explain this positive effect of higher education on second and third birth order fertility? We can show different interpretations: on the one hand, more educated women can be not particularly career-oriented (Mott, Shapiro, 1983; Sobotka, Testa, 2008; Wilkie, 1981). On the other hand, the transition rate to the second and third child may be pushed up by the so-called ''time-squeeze'' effect (Kreyenfeld, 2002): higher educated women have less time than less educated women in term of reaching the age limit of fertility, so they can accelerate the second childbearing. Another interpretation considers the level of gender equity that support women to combine work and family life. McDonald (2000a, 2000b) suggests that an increase in fertility

can be observed in contexts where gender equity is high. In addition, we can link the gender equity perspective with the education, outlining that equity within couples is more common among higher educated individuals (Duvander, Andersson 2006; Brodmann *et al.,* 2007; Duvander *et al.,* 2010). These couples share housework and childcare and the man's involvement helps woman to reduce the workload and this has an effect on second and third births. The gender equity approach has been developed by Goldscheider, Bernhardt and Lappegård (2015), Esping-Andersen (2009; 2016) and Esping-Andersen and Billari (2015). They suggest that the link between gender equity and family outcomes is driven by the revolution of women's roles. In particular, Goldscheider and colleagues observe that gender revolution has two stages. In the first one, women begin to participate to labour market, to educational systems and start to enter in political institutions. As results, there is an increasing in divorce rates and postponement of childbearing, overall among higher educated and career-oriented women. In the second stage, the women's new roles are socially accepted by society and, in turn, men begin to be more involved in housework and childcare. According to this approach, in this new situation fertility rate and stability of unions rebound.

European countries are experiencing this revolution and starting from this gender equity approach Esping-Andersen and Billari (2015) theorise a transition from the Becker equilibrium, characterised by a strict division of paid and unpaid work and where the male-breadwinner model prevails, towards the gender-egalitarian equilibrium. According to Esping-Andersen and Billari (2015), we can have three stages of this revolution linked with fertility rate. The transition from one step to another shows a U-shaped curve (as it is shown in Figure 2).

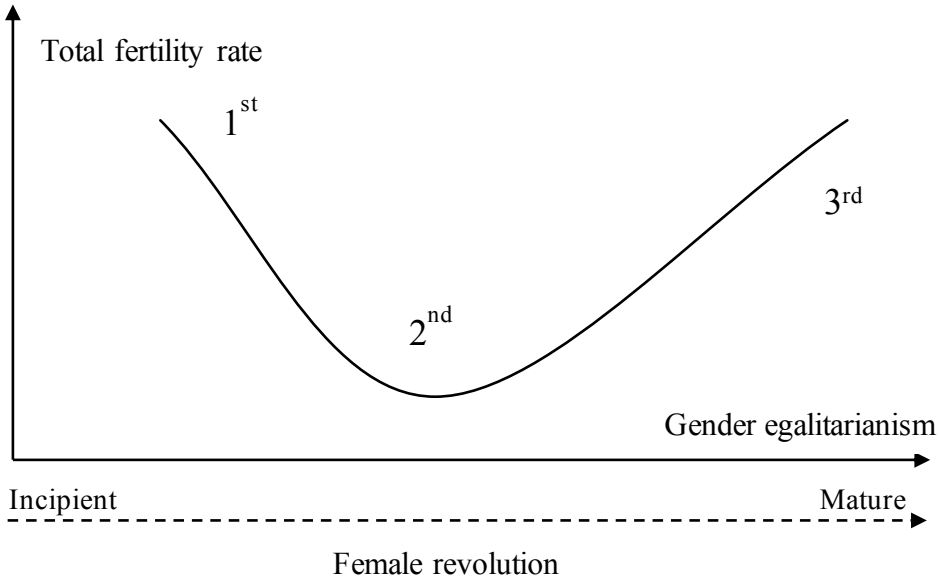


Figure 2 The Revolution of Women's Roles and Fertility. Source: Esping-Andersen, Billari (2015)

The first stage is characterised by the prevalence of the male-breadwinner/female homemaker and caretaker model and due to the fact that gender revolution has not advanced yet, this model is accepted by the society and fertility rate is high. In line with Becker's theory, if this family norm is dominant there is an *equilibrium status*, because expectations about gender's role is ensured by task specialisation and women invest in homemaker skills. The second stage shows an unstable situation: gender revolution has advanced, the male breadwinner model starts to creak, but society has not adapted yet. This new phase can be reached if some exogenous shocks invest the society. For example, Goldin's research (2006) identifies three changes: modern birth control; the increase of women's education; the labour-saving household technologies. This stage is characterized by *multiple equilibria*: in particular, an increase in uncertainty and a decrease in trust can be a precondition for low fertility rate level.

Finally, the last step: this situation is characterised again by an *equilibrium status*. The new stable equilibrium is based on gender equity's norms and practices both at institutional level and couple level. When gender egalitarianism has achieved the normative status trust is high, and individuals are more "confidence" in respect to family life and, consequently, fertility raises again. Esping-Andersen (2016) suggests that the revolution of women's roles is irreversible so in advanced democratic countries the new equilibrium should emerge.

These approaches, taking into account gender equity, suggest that both the decline and the rebound in the level of fertility are driven by the same group: higher educated women, who are leading the revolution. More educated women follow their career aspirations, enter in labour market and they are the first to encounter difficulties in combine work and family. In the second stage, this revolution causes a rising in opportunity costs of motherhood, in particular among higher educated people. However, more educated women have higher possibilities to balance work and family and are more likely to have partners that adopt more egalitarianism norm, with whom share domestic tasks.

Regarding European countries, the change in women's role is still incomplete and the new gender-equality model is far from being dominant (Esping-Andersen, 2009). If the balancing between professional work and family life is the core to understand different fertility level, not just at the micro level within particular populations but also at the cross-country level in Europe, we need to observe the difference between countries with high versus low compatibility of paid work and parenting, because they can have important effect on delayed second and third birth parities. These effects are expected to be stronger in the context of inflexible labour markets and inadequate availability of child care facilities (Kohler *et al.*, 2006). In contrast, if child care is supported by welfare states and it is culturally acceptable to use it even with very young children, the opportunity costs of parity progression decrease (Rindfuss *et al.*, 2007).

Since 1980s, evidences from previous studies show a geographic difference between Western and Eastern countries: the higher intensities in the transition second and third birth among higher educated women are founded in Northern Europe (Hoem, Hoem, 1989; Vikat, 2004; Kravdal, 2007; Gerster *et al.* 2007), but also in Central Europe: Austria (Hoem *et al.*, 2001), France (Köppen, 2006), Germany (Kreyenfeld, 2002; Köppen, 2006), and Great Britain (Ermisch, 1989; Kreyenfeld, Zabel, 2005) and in Southern Europe: Italy (Impicciatore, Dalla Zuanna, 2016). By contrast, Eastern Europe has demonstrated prevailingly negative, or in part non-positive, association between women's educational attainment and second/third birth transition. This finding is showed in Hungary (Olàh, 2003), Romania (Mureşan, 2007), Russia (Rieck, 2006), and Ukraine (Perelli-Harris, 2008). Authors of these studies have attributed the negative educational gradient of rapid societal change that involved the deterioration of

living standards, downscaling the policies meant to facilitate the combination of employment and parenthood, reduction of child-care benefits on the one hand, and increased returns from education, and exposure to new ideas on the other.

Given the literature previously debated, we test four hypotheses:

H1) Higher educated women postpone first childbirth or remain childless in order to achieve higher positions in the labour market.

H2) The negative effect of education on fertility is softened or disappear after the first birth, because it may be easier for graduated women to combine work and parenthood since they have more protective labour contracts.

H3) There is a positive effect of higher levels of education on fertility among younger cohorts, because we expect that younger cohorts lead the change. In fact, we expect that gender egalitarianism is becoming the norm among younger and more educated women, because they are more likely to have partners with whom share domestic and childcare tasks.

H4) A stronger negative educational gradient in countries where male-breadwinner and female-housewife system persists than in countries where there is a more gender equity model. In a general sense, we expect a stronger negative educational gradient in Eastern Europe than in Western Europe.

2.2 Empirical Strategy

Our empirical analysis is based on Gender and Generation Survey and, for Italy, on *Famiglie e Soggetti Sociali*, conducted in 2009.

The main substantive goal of the GGS is to improve our understanding about demographic and social developments and about the factors that these developments, with a particular attention towards relationships between children and parents (generations) and relationships between partners (gender) (Macura, 2002) (http://www.ggp-i.org/). The surveys, which include individuals between 18- and 79-years old cover different topics: fertility, the transition to adulthood, economic activity, care duties, and attitudes. Each country developed the survey

independently, following the guidelines of the Generation and Gender Programme. Furthermore, GGS data are suitable to study fertility, especially for cohorts born after the 1940s and for periods after the 1970s (Vergauwen *et al.*, 2015).

Fokkema and colleagues (2016) offer an overview of all the specific sampling designs and fieldworks. In general, the GGS have relatively high response rates, over 50% for many countries and with four countries (Bulgaria, Estonia, Georgia, and Romania) even surpassing the 70% threshold. Belgium, the Czech Republic, and Lithuania have respectively response rates of about 42%, 49%, and 36%. The main reasons for the lower response deals with the difficulties in contacting the sample units and the unwillingness to cooperate (Fokkema *et al.,* 2016) (Appendix I provides more details on GGS first wave).

The second wave of GGS is affected by a falling in response rates and to attrition. In particular, Germany and Lithuania have respectively an overall response rate of about 32% and 23% (Bartus, Spéder, 2013). We decided to keep them, even if the attrition rate is especially high; however, caution in interpretation is needed for these countries. More details about how the attrition is distributed are provided in the Appendix II, that focuses on all countries of the second wave selected and on the main variables analysed.

Though, we decided to use both first and second wave of Gender and Generation Survey, in order not only to compare countries from different welfare state regime, but also to have information gathered in more recent years. In fact, in the first wave, GGS gathered data also in Sweden, but there are no Nordic countries in the second wave.

Furthermore, another advantage of analysing the two waves is to observe the difference between first and second wave, then considering the different years in which the two surveys were conducted.

The second source is FFS, the survey is part of the cycle of multi-purpose thematic surveys on families and it was gathered in 2009 (https://www.istat.it/it/archivio/4913). It is the main source of statistics on the socio-demographic characteristics of families in Italy and their dynamics over time. It gathers data on various topics: the individual and family life cycle, the relationships within the family, the support received from families and the help given to non-cohabiting people, the care and custody of children, the permanence of young people in the family and the intentions of leaving the family of origin,

reproductive intentions, social mobility, family economy and domestic work, family care services and career paths. We have chosen to use the last wave, conducted in 2009, it is a cross-sectional dataset, but it gathers information also retrospectively.

Both GGS and FSS datasets can be observed longitudinally, using the month and the year of each episode of interest. The use of longitudinal information can have a double advantage: firstly, these data can permit to observe not only the "moment" when the interview took place, but also how episodes of parity change over time, without limiting the analysis of the synchronic relationship between variables. Secondly, in this way we can apply statistic methods developed in the context of Event History Analysis; these techniques are often adopted in order to observe phenomena that change over time and in particular they are useful to analyse fertility dynamics (Blossfeld, Rohwer, 1995).

The following sections describe our sample and the method that we used for our analysis.

2.2.1 Sample

Observing the first wave, the initial sample of all countries[1] selected consisted of 107,358 women. In order to compare countries from the first wave of GGS and FSS 2009, we "forced" the year of interview at December 2005 (so, the end of the episode is fixed at December 2005 and we do not consider life trajectories and events occurred after December 2005). In fact, GGS gathered data for the first wave in different years from 2002 for the Netherlands to 2013 for Sweden, so to compare countries we decided to force the year of the interview to December 2005 for Belgium, Poland, Sweden[2] and Italy (using the Italian survey, FSS conducted in 2009) (Table 1).

Table 1 Countries selected and year of the interview. Source: Istat FSS 2009, GGS 1st wave

COUNTRY	YEAR OF INTERVIEW
Belgium	2008/2010
Bulgaria	2004

[1] Bulgaria, Belgium, Estonia, France, Georgia, Germany, Hungary, Italy, Lithuania, the Czech Republic, the Netherlands, Poland, Romania, Russia, Sweden

[2] We did not select Austria because it gathered data just on cohorts born after 1960

The Czech Republic	2005
Estonia	2004/2005
France	2005
Georgia	2006
Germany	2005
Hungary	2004/2005
Lithuania	2006
The Netherlands	2002/2004
Poland	2010/2011
Romania	2005
Russia	2004
Sweden	2012/2013

From the initial sample, we decided to include only women born from 1940 to 1979, so we deleted 35,117 observations. We also excluded cases with missing information (no response/refusal/do not know) on year of birth of children: for the first child we dropped 1,302 observations, for the second child we excluded 1,113 cases and for the third one we dropped 2,139. From our analysis, we dropped also 1,485 twins.

Furthermore, we excluded also 31 cases in which the child was older than the mother and 402 cases for whom the childbirth happened before the 14th birthday of the mother.

Regarding to our variable of interest, education, we deleted 115 observations[3] and 373 missing cases.

After these selections, the sample of the first wave has 66,103 respondents.

With regard to higher order births, we consider the respondents at risk of having a second child were those who had a first child, then we dropped the respondents who did not experience a first child during our observational period (10,935 cases). As a result, for the second birth analysis, the sample totals 55,541 cases.

The procedure for the third birth is the same as the one followed for the second birth. The respondents at risk of having the third child were those who had a second child during the observational period. Thanks to this selection we deleted 16,246

[3] In the paragraph 2.2.2.1, we explain how we coded education and why we deleted these observations

more cases because they did not experience a second birth. The total sample for the third birth analysis amounts to 39,295 respondents.

Table 2 Number of women selected for each parity. Source Istat FSS 2009, GGS 1st wave

Parity	Number of women (N)
First	66,103
Second	55,541
Third	39,295

Regarding the second wave we decided to keep for our analysis Bulgaria, France, Germany, Georgia, Hungary, Lithuania and the Czech Republic[4]. The year of interview is similar of all considered countries: in fact, data are gathered between 2007 and 2009 as it is showed in the Table 3.

Table 3 Countries selected and year of the interview. Source Istat FSS 2009, GGS 2nd wave

COUNTRY	YEAR OF INTERVIEW
Bulgaria	2007
France	2008
Georgia	2009
Germany	2008/2009
Hungary	2008/2009
Lithuania	2009
The Czech Republic	2008

Including all countries selected[5], from an initial sample of 69,719 women, we excluded from the analysis women born before 1940 and born after 1979 (n=17,107). Then we dropped cases with missing or misreported information on year of birth of children: for the first child we dropped 1,392 observations, for the second child we deleted 697 cases and for the third one we excluded 150 cases. We decided to eliminate 506 cases for which the second/third child was born before the first/second one. Then we excluded also twins (480 cases). Moreover, we excluded

[4] We decided to select these countries and eliminate Austria because has only cohorts born after 1960 (as in the first wave), Russia does not provide information about jobs and on age in which the respondent achieving the current education level and The Netherlands because it does not have information on the birth month of the children.

[5] Bulgaria, France, Germany, Georgia, Hungary, Italy, Lithuania, the Czech Republic

also 5 cases in which the data gathered for the mother shows that the year of birth of mothers occurs after the year of birth of their children. Finally, we deleted cases for whom the childbirth occurred before the 14th birthday of the mother (43 cases). Regarding to our variable of interest, education, we deleted 12 observations[6], and 2 missing cases. After these selections, our sample totals 27,194 women.

Concerning higher order births, to analyse the transition to the second birth we eliminate cases of respondents who did not experience a first child during our observational period (4,676 cases). As a result, for the second birth analysis, the sample totals 22,518 cases. We followed the same procedure also for the transition to the third birth, deleting 6,515 cases of women who did not have the second child. After this selection the total sample for the third birth analysis amounts to 16,003 women.

Table 4 Number of women selected for each parity. Source Istat FSS 2009, GGS 2nd wave

Parity	Number of women (N)
First	27,194
Second	22,518
Third	16,003

2.2.2 Variables

Our model contains three time-constant covariates and one time-varying covariate. To investigate the influence on first/second and third birth risks, we have selected the time-varying covariate enrolled in education, and as time-constant covariates we have chosen education, cohorts and age at first/second birth. In the following sessions, we describe the time-varying and time-constant covariates and our expectations about the influence of the covariates on birth risks. At the end of this subsection, we report the descriptive statistics by country, both for the first and second wave.

2.2.2.1 Education

As we said before, our variable of interest is education. We decided to use education as time-constant variable because in the second wave of GGS, there is neither the

[6] In the paragraph 2.2.2.1, we explain how we coded education and why we deleted these observations

starting nor the ending dates of graduation, and it was not possible to assign the dates using the average age of graduation primarily for two reasons: the first one concerns the different years of birth and the average age of graduation changes across cohorts. The second one is related to the fact that the average age changes depending of the course that student choose (general programme/vocational programmes; bachelor's degree/master's degree) and the dataset doesn't distinguish between fields/courses. We have tried to overtake this problem including cohorts; in this way we can observe time-variation.

Both for first and second wave, we decided to recode education in three levels: low, medium and high, following the ISCED code (UNESCO, 2011). In particular, we have collapsed together ISCED 0 - pre-primary education, ISCED 1 - primary level and ISCED 2 - lower secondary level into low level; we have recoded ISCED 3 - upper secondary level and ISCED 4 - post secondary non-tertiary as medium level. Finally, we have joined ISCED 5 - first stage of tertiary and ISCED 6 - second stage of tertiary in high level[7]. For Italy, we have recoded as low level the individuals that have obtained as their highest level of education a lower secondary school certificate, as medium level the attainment of the upper secondary school degree and, finally, as high level if they have a university diploma.

We decided to observe education in order to answer to the first and second hypotheses: in fact, nowadays, women stay longer in the educational system than women born in older cohorts. Furthermore, higher educated women increase their probability to establish a more stable career, reducing economic and social uncertainty. Following this, we assume that higher educated women increase their propensity to have the second child.

[7] In both first and second wave, we have eliminated from our sample the categories "still pupil", "still in training" and "other education", gathered just for Germany. We have deleted in the first wave 73 observations and in the second wave 12 observations. In both the two waves, in France, the survey coded education using ISCED97: in particular we have 0, 1-2 (collapsed in low level); 3-3A, 4-3B, 3C (recoded as medium level); 5A-6, 5B (transformed into high level). In the first wave, in Bulgaria, there is another category labelled "has not studied in school, including illiterate", we have decided to drop it and 43 cases have been deleted.
In the second wave, in Bulgaria there is a category called "secondary education level (all kinds)", we decided to include it in the medium level.

2.2.2.2 Cohorts

The reduction in fertility was mostly driven by reduction in the progression ratio to third and higher birth order among the older cohorts, born between 1940 and 1955. However, if we observe cohorts of women born between 1955 and 1970, the are some difference at European level. In particular, Central and Eastern Europe experience a falling in the transition to second childbirth, while German-speaking countries and Southern Europe countries show a decrease in first birth rates. In the Nordic countries, fertility is stable or even increases (Zeman *et al.*, 2018). In particular Northern European countries and France stand out for family policies that support women to combine work and family. Promoting policies that help work-family balance can be found in countries where no great changes in the structure of the families happened. In countries where childcare is not supported by the State and still relies on the family (grandparents), as in Italy (Saraceno, Keck, 2010), women who want to purse their career may renounce having a child. In Central and Eastern Europe, fertility fell mostly due to the declining transition to second childbirth, especially highly educated women often choose to have only one child to satisfy the social norm of becoming a mother, while at the same time they prevent the problem of combining a full-time work with household and child care tasks (Frejka, 2008; Brzozowska, 2015).

However, analysing women cohorts born between 1975 and 1979, Myrskylä and colleagues (2013) suggest that the long-term trend in fertility decline is flattening or has reversed in European countries. In particular, Continental countries are experiencing a reversed direction from decline to increase. Nordic and Baltic countries are stable and also in the Mediterranean countries seems that the decline is ending (Caltabiano *et al.*, 2009). Again, in line with McDonald (2000a) and Esping-Andersen (2009), gender equality seems to be a strong determinant to understand fertility. Where the difference between men and women in term of educational, occupational and political terms is low, fertility is high (McDonald, 2000a, 2006a; Esping-Andersen 2009; Esping-Andersen, Billari 2015; Baizán *et al.*, 2016).

2.2.2.3 Enrolled in education

The relevance of educational enrolment is widely emphasised in literature (Hoem, 1986; Goldscheider, Waite, 1986; Blossfeld, Huinink, 1991; Billari, Philipov, 2004; Kravdal, 1994, 2007). Hoem (1986), in particular, finds that the impact of being enrolled in education is higher than the level of education if we observe the transition to the first union. In this line, Kravdal (1994) suggests that in Norway the effects of the educational level on the transition to motherhood are smaller compared to the effects of being a student. We decided to introduce this time-varying variable, based on the age of leaving school. Following this, we assume that being enrolled in education has a negative impact on the transition to motherhood. By contrast, this effect is softened or even disappear when we observe the transition to the second and third birth.

2.2.2.4 Woman's age at previous birth

As we explained in the previous chapters, the expansion in education led women to increase their participation in educational system and length of stay in education is one of the factors of birth postponement, especially for the first birth. One assumption is that women who have their first child late, have the second one relatively faster, increasing second birth intensities. A late age at first birth, in fact, might generally have a reducing effect on the transition to the second/third childbirth. However, this does not necessarily happen among higher educated women, who usually have a first child later in their lives but can accelerate following parities. This variable can capture the potential catch-up effect for women with a postponed fertility (Impicciatore, Dalla Zuanna, 2016). In order to observe if the positive educational gradient for second and third birth can be explained in terms of time-squeeze, we performed an interaction effect between age at previous childbirth and education, suggesting that higher educated women compared with lower educated women accelerate especially the second birth.

Table 5 Description of the sample by country. Source: Istat FSS 2009, GGS 1st wave

	Bulgaria	Belgium	Estonia	France	Georgia	Germany	Hungary	Italy
Education								
Primary	20.86	29.36	12.56	28.77	8.81	12.16	23.49	49.37
Secondary	49.39	31.19	49.25	39.51	60.81	62.91	56.61	33.52
Tertiary	29.75	39.45	38.19	31.72	30.38	24.93	19.9	17.11
Cohorts								
40-49	15.7	20.26	23	21.88	18.49	19.35	24.37	21.06
50-59	15.78	25.98	26.13	26.92	25.76	25.98	26.93	24.67
60-69	33.96	29.24	24.59	26.81	29.46	32.64	21.32	28.78
70-79	34.57	24.51	26.28	24.39	26.29	22.02	27.38	25.49
Age at first birth (mean)	22.36	25.58	23.35	24.78	23.22	25.37	22.91	26.23
Age at second birth (mean)	25.39	28.03	27.02	27.67	25.4	28.18	26.17	29.27
N	2.517	4.918	3.383	3.834	3.812	3.710	5.351	11.588

Table 1 of 2

	Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands	Total
Education								
Primary	10.22	17.22	41.4	8.24	9.99	17.11	32.99	24.83
Secondary	62.85	61.41	48.26	42.35	48.27	69.01	33.26	48.42
Tertiary	26.93	21.37	10.34	49.41	41.74	13.88	33.75	26.75
Cohorts								
40-49	23.47	17.78	24.09	20.08	24.66	21.9	20.51	20.97
50-59	24.18	24.44	28.41	30.76	23.71	23.86	24.55	25.08
60-69	27.96	23.28	24.66	25.86	27.71	25.05	32.22	27.54
70-79	24.4	34.5	22.84	23.3	23.92	29.18	22.73	26.41
Age at first birth (mean)	24.03	24.04	23.05	22.83	25.87	23.08	26.87	24.3
Age at second birth (mean)	27.38	26.42	25.69	26.92	28.87	26.05	29.11	27.29
N	3.230	5.237	4.080	4.347	3.244	3,214	3,638	66.103

Table 2 of 2

Table 6 Description of the sample by country. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria	Germany	France	Hungary	Italy	Lithuania	Czech Rep	Georgia	Total
Education									
Primary	23.86	9.13	26.12	12.71	49.37	20.44	13.84	7.85	30.71
Secondary	48.05	61.5	40.4	53.91	33.52	49.01	71.28	62.53	45.16
Tertiary	28.08	29.36	33.48	33.38	17.11	30.55	14.88	29.62	24.13
Cohorts									
40-49	16.76	19.43	21.49	6.14	21.06	24.51	25.68	18.35	19.13
50-59	16.57	27.9	26.49	14.14	24.67	26.59	25.2	26.8	23.34
60-69	34	35.14	27.77	31.69	28.78	25.6	22.56	29.29	29.64
70-79	32.68	17.53	24.25	48.02	25.49	23.3	26.56	25.56	27.9
Age at first birth (mean)	22.45	26.02	25.6	24.61	26.23	24.01	23.26	23.47	24.88
Age at second birth (mean)	25.54	29.05	28.39	27.38	29.27	27.49	26.53	25.5	27.73
N	3700	1369	2676	2376	11588	910	1250	3325	27194

2.2.3 Method

In this dissertation, the main technique applied is event history analysis and its advancements. Since the 1970s, the theoretical framework based on the life course approach has often been combined with survival analyses methodology. The enhancements in data availability with regard to retrospective and longitudinal data, which give information about the time of occurrence of the events under study, have contributed to the diffusion and improvements of event history techniques. Event history analysis is an adequate method to study the events that occurred during the life history of an individual (e.g., enrolment in education, employment, union formation, migration, parenthood, and retirement); the occurrence of these events marks the transition from one state of the life course to another (Blossfeld, *et al.*, 2007). In particular, we applied a flexible approach, the piecewise constant exponential model using STATA software. This model is a simple generalization of the standard exponential model. This model has the flexibility of the Cox model, but you can also estimate the shape of the hazard function (Blossfeld *et al.*, 2007; Mills, 2011). This model considers the hazard rate as a step function of time (T). After splitting the time axis in intervals, each period is treated as a "dummy variable" and the model estimates each dummy, which represents the function for that particular period. In this model, we assume that the hazard remains constant within each interval, but it may change among subintervals. Formally, we can write the equation defining J as a set of intervals with the cut points of α_0, and nodes are at points α_1,... α_j, and $\alpha_0 = 0$ and $\alpha_j = \infty$. Thus, interval j is (α_{j-1}, α_j) and the hazard for one individual (i) is:

$$\mathrm{h}_i(t) = \lambda\, \mathrm{e}^{\beta x_i} \qquad \text{for} \qquad \alpha_{j-1} \leq t \leq \alpha_j$$

This expression is equivalent to the following equation, where $\alpha_j = \log \lambda$ and is the log of the baseline hazard and $x_i\beta$ is the relative risk for an individual with covariate values x_i, compared to the baseline, at any given time.

$$\log h_i\,(t) = \alpha_j + x_i\beta$$

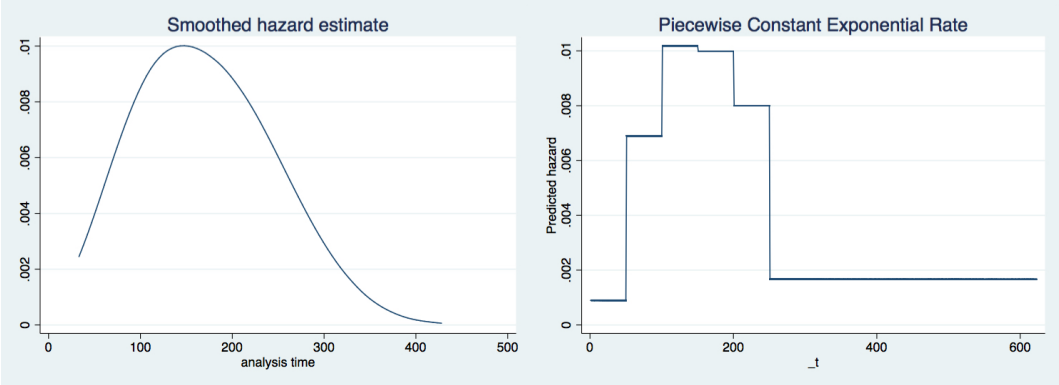
Time periods can be arbitrarily defined. However, there is some trade-off: on the one hand, a large number of periods means a better approximation of the unknown baseline rate; on the other hand, estimation problems can emerge due to many coefficients to be estimated. Generally speaking, each time period should contain an adequate number of occurrences, otherwise, convergence (using the maximum likelihood estimation) will not be reached. Using this model, we consider women with a complete fertility history but also those interviewed before the end of their reproductive age (i.e., right- censored).

We decided to express all dates in the data file in terms of months and years and we decided to transform them into century month codes. A century month code (CMC) is the number of the month since the start of the century (for example, January 1900 is CMC 1, following the formula CMC = ((YYYY-1900) * 12) + MM). In some cases, GGS gathers the season instead of the month of birth (Autumn, Winter, the end of Winter, the beginning of Winter, Spring and Summer), in these cases we have extracted a month randomly within the season. For the end of Winter, we have decided to replace it with December and for the beginning of Winter, we have selected randomly a month between January and February, as suggested in codebook.

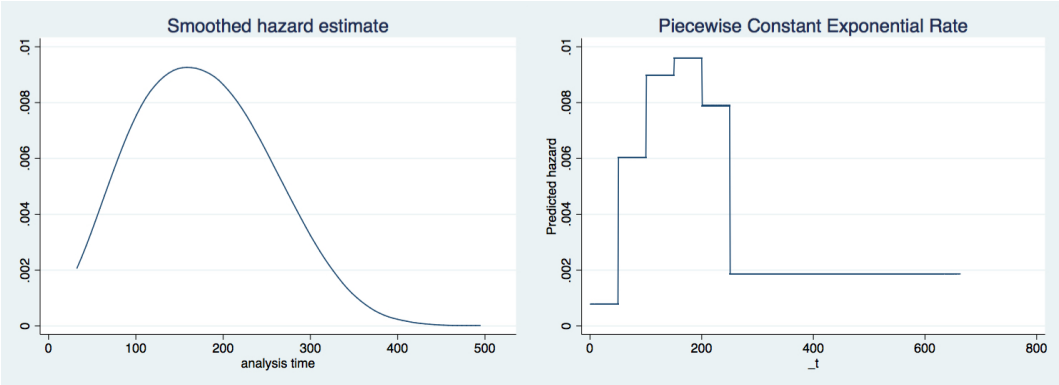
The main event of interest is not only the transition to motherhood (transition to first birth), but we also focus on the transition to the second and third births. As the present study focuses on the transition to the first, second and third birth in female population, we selected women born from 1950 to 1979 and we considered respondents who appear "at risk" of second/third birth, women who have had at least one biological child recorded and we include the effect of a time-varying variable, namely enrolled in education. Time-dependent variables are those where the values change over time. In our model, the time-varying variable is binary and vary discretely over time (0 and 1).

For the transition to the first parity, episodes begin at the 14^{th} birthday and end with the birth of the first child (event occurred) or at the interview (event is right-censored). The baseline is the woman's current age. For the transition to the first birth, we divided the curve into 5 nodes both for the first and second wave (50, 100, 150, 200 and 250 that mean 18^{th}, 22^{nd}, 26^{th}, 30^{th} and 35^{th} birthday starting from 14^{th} birthday. The following graphs show for both waves the hazard estimate and the piecewise constant exponential rate. In particular, the first graph, which shows the

hazard, is helpful to decided intervals while the second graph displays piecewise constant exponential rate after the curve is cut (Graph 3).

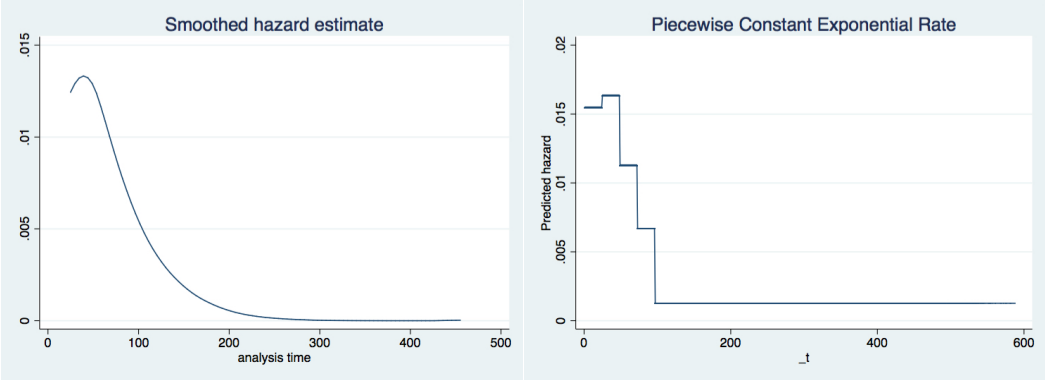


Graph 3 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the first birth in selected countries. Source: GGS 1st wave and FSS 2009

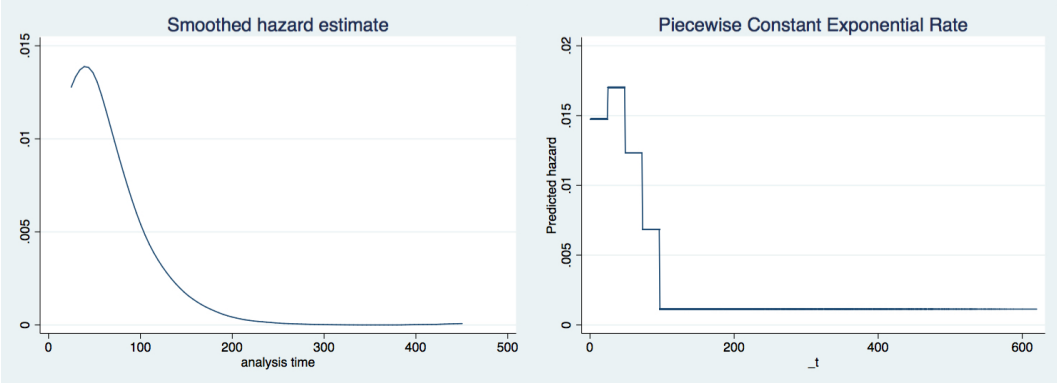


Graph 4 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the first birth in selected countries. Source: GGS 2nd wave and FSS 2009

For the transition to the second and third parity, episodes begin at the birth of the first (second) child and end with the birth of the second (third) child or at the interview. In this case the baseline is the duration since the birth of the first (second) child. For the transition to the second birth, we selected 4 nodes, so we have 5 intervals both for the first and second wave (24, 48, 72 and 96 months that translating into years are 2, 4, 6 and 8 years after the birth of the first child). As for the transition to the first childbirth, we present the hazard estimate and the piecewise constant exponential rate graphs for both the first and second wave (Graph 5 and 6).

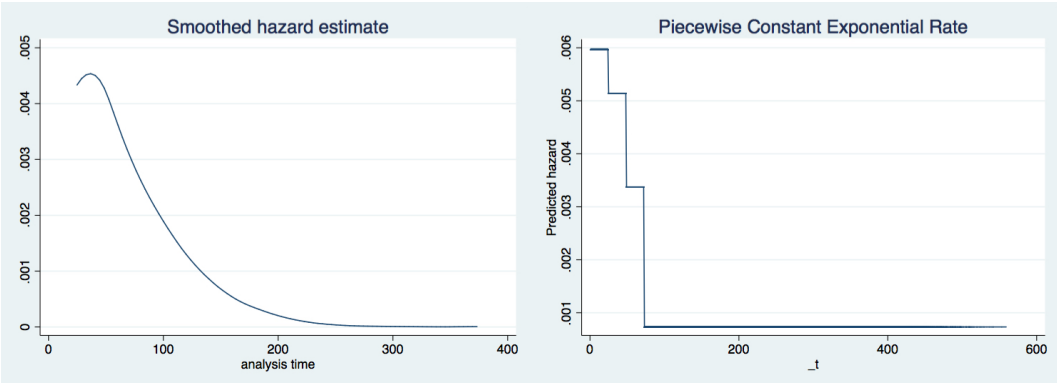


Graph 5 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the second birth, in selected countries. Source: GGS 1st wave and FSS 2009

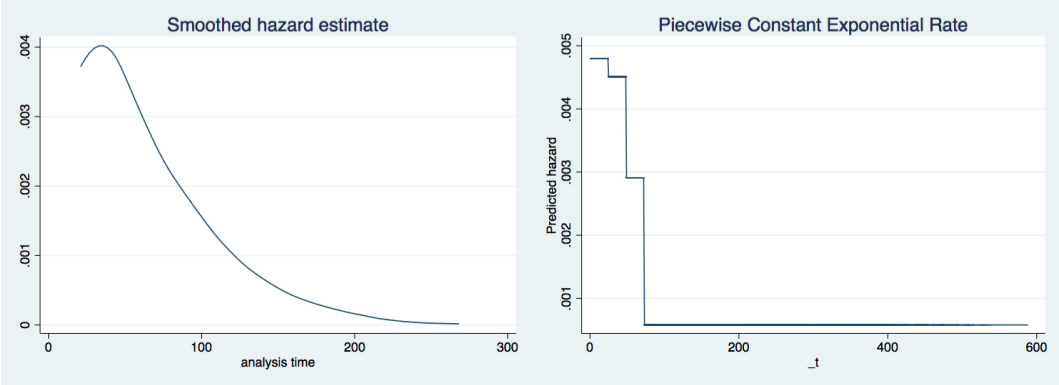


Graph 6 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the second birth in in selected countries. Source: GGS 2nd wave and FSS 2009

For the transition to the third birth, we divided the curve into nodes both for the first and second wave (24, 48 and 72 months so 2, 4 and 6 years after the birth of the second child). As for the transition to first and second childbirth, graphs show the hazard estimate and the piecewise constant exponential rate graphs for both the first and second wave (Graph 7 and 8).



Graph 7 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the third birth in in selected countries. Source: GGS 1st wave and FSS 2009



Graph 8 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the third birth in in selected countries. Source: GGS 2nd wave and FSS 2009

In particular, for the purpose of the analysis of this chapter, we decided to apply nested models, adding a "new variable" in each model, to observe how the main independent variable changes. We perform these nested models for each transition and for each country. For the transition to the first childbirth we have two models and for the transition to the second and third childbirth we have three models:

$$\log h^{(1)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2$$
$$\log h^{(1)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2 + x_i\beta_3(t)$$

$$\log h^{(2)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2$$
$$\log h^{(2)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2 + x_i\beta_3(t)$$
$$\log h^{(2)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2 + x_i\beta_3(t) + x_i\beta_4$$

$$\log h^{(3)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2$$
$$\log h^{(3)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2 + x_i\beta_3(t)$$
$$\log h^{(3)}{}_i\,(t) = \alpha_j + x_i\beta_1 + x_i\beta_2 + x_i\beta_3(t) + x_i\beta_4$$

Where $\log h^{(j)}{}_i$ is the logarithm of the risk of having a j^{th} child at time t and α_j is the log of the baseline hazard. The covariates are β_1, which it is the main independent variable and represents education (divided in three categories: low, medium and high); β_2 is cohorts (1940-1949; 1950-1959; 1960-1969; 1970-1979). In the third model, we introduce the time-varying covariate $\beta_3(t)$. It is a dummy for being engaged in full-time education (student: yes/no) based on the age of leaving school. Moreover, in the third model for the transition to second and third parity, we introduce the age at previous childbirth $x_i\beta_4$, divided in four categories

(from minimum to 25 years old; 26-30; 31-35; from 36 to maximum). It is important to note that for the transition to the second birth, we considered also the age of the mother at first child and for the transition to the third one, we included the age of the woman at second child.

Furthermore, to answer the second hypothesis we observed the interaction effect between education and woman's age at previous childbirth. In this way, we can capture the time-squeeze mechanism, for which less educated women that postpone the first birth wait longer than higher educated women before having the second childbearing. Finally, in order to answer the third hypothesis about a cohort-effect, according to which younger and more educated lead the revolution and experience higher propensity to have the second and third child, we included an interaction effect between education and cohorts. In this case, for sample size reasons we recode the variable cohorts, collapsing the older one and the younger one into two categories 1940-1959 and 1960-1979.

2.3 Empirical results

We first discuss the results for the transition to motherhood, followed by a discussion about the findings for higher order births. For each parity, we refer to the models that we described in the previous sections. Overall, the effects of control variables tend to be in line with expectations, however, we only discuss in detail the variable of major interest for this paper: the level of education. The last part focuses on the results of interaction effect: the first one, between education and woman's age at previous childbirth and the second one, between education and cohorts. All complete models can be found in the Appendix III, at the end of the thesis.

2.3.1 First child

Focusing on the propensity to have the first childbirth, if we observe the first model controlled only for the variable cohorts, estimates confirm the negative educational gradient already highlighted by previous studies. Higher educated women postponed the transition to the first birth, while less educated women experience higher propensity to motherhood, compared to secondary educated women (except

in the Czech Republic, where the coefficient is not statistically significant) (Model 1, Table 7 and 8).

Table 7 Model 1: Hazard models for the First childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Modello 1		Bulgaria	Belgium	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	0.506***	0.100*	0.213***	0.334***	0.267***	0.170*	0.382***	0.358***
	se	0.039	0.057	0.059	0.044	0.063	0.057	0.037	0.024
High educ.	coeff	-0.561***	-0.333***	-0.414***	-0.418***	-0.471***	-0.283***	-0.484***	-0.363***
	se	0.037	0.053	0.04	0.045	0.04	0.044	0.041	0.033

Table 1 of 2

Modello 1		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	-0.065	0.506***	0.413***	0.173*	0.188*	0.051	0.427***
	se	0.067	0.042	0.037	0.062	0.066	0.053	0.047
High educ.	coeff	-0.399***	-0.602***	-0.616***	-0.329***	-0.296***	-0.499***	-0.504***
	se	0.045	0.04	0.063	0.033	0.039	0.06	0.05

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

The same scenario appears in the first model of the second wave of GGS, higher educated women experience less propensity to become mother compared to women that have the secondary education as their highest level of education. Concerning the lower educated women, primary education is in all countries associated with higher propensity to motherhood. Furthermore, if we compare the first and the second wave, we can observe that the coefficient among lower educated women in Lithuania is statistically significant. However, as we outlined in the Appendix II, due to attrition we need to pay attention when we describe results for Lithuania, the Czech Republic and Germany.

Table 8 Model 1: Hazard models for the First childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Modello 1		*Bulgaria*	*Germany*	*France*	*Hungary*	*Italy*	*Lithuania*	*The Czech Republic*	*Georgia*
Low educ.	coeff	0.429***	0.316*	0.276***	0.138*	0.358***	0.202*	0.178*	0.305***
	se	0.043	0.103	0.054	0.072	0.024	0.093	0.09	0.069
High educ.	coeff	-0.495***	-0.302***	-0.363***	-0.450***	-0.363***	-0.500***	-0.478***	-0.561***
	se	0.043	0.066	0.052	0.052	0.033	0.084	0.089	0.043

* p<0.05, ** p<0.01, *** p<0.001

Observing the Model 2 for the first wave (Table 9), controlled also for being enrolled in education, the negative effect of higher education on the transition to motherhood is not significant in Germany, the Czech Republic and Italy. In the second wave (Table 10) is not statistically significant in Germany, the Czech Republic and in Bulgaria (while in the first wave is negative). The second wave shows similar result for Lithuania, Georgia and France, where the coefficient is negative, and in Germany, where is not statistically significant. The effect among higher educated women is softened in all other countries and in both waves.

If we observe the lower educated women the coefficient is negative only in the first wave of Lithuania, suggesting a reverse U-shaped curve for which both primary and tertiary educated women experience lower propensity to motherhood.

The most relevant difference among the first and the second wave is shown by the Hungarian case: in the first wave higher educated women are associated with higher level of transition to motherhood, by contrast in the second wave the coefficient is negative. In the first wave seems that being enrolled in education "capture" the effect of education, suggesting a U-shaped relation for which both tertiary and primary educated women are more inclined to become mother; while in the second wave higher educated women show less propensity compared to secondary educated women, more in line with our hypothesis.

Table 9 Model 2: Hazard models for the First childbirth. Hazard models also include the variable cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Modello 2		Bulgaria	Belgium	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	0.344***	0.035	0.088	0.213***	0.106*	0.08	0.298***	0.288***
	se	0.04	0.057	0.059	0.044	0.064	0.057	0.037	0.024
High educ.	coeff	-0.133*	-0.137*	-0.114*	-0.173***	-0.196***	0.025	0.115*	-0.057
	se	0.042	0.054	0.044	0.047	0.044	0.047	0.052	0.035

Table 1 of 2

Modello 2		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	-0.206*	0.327***	0.243***	0.077	0.138*	-0.088	0.394***
	se	0.068	0.042	0.038	0.062	0.066	0.053	0.048
High educ.	coeff	-0.135*	-0.123*	-0.198*	-0.079*	-0.189***	-0.01	-0.216***
	se	0.049	0.045	0.066	0.036	0.042	0.066	0.055

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 10 Model 2: Hazard models for the First childbirth. Hazard models also include the variable cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Modello 2		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	0.254***	0.195*	0.168*	0.004	0.288***	0.028	0.062	0.084
	se	0.044	0.104	0.054	0.073	0.024	0.095	0.09	0.07
High educ.	coeff	0.078	0.048	-0.116*	-0.199***	-0.057	-0.240*	-0.038	-0.210***
	se	0.05	0.07	0.054	0.058	0.035	0.09	0.098	0.047

* p<0.05, ** p<0.01, *** p<0.001

As we underlined in paragraph 2.2.2.3, educational enrolment is an important factor to understand the transition to the first parity. In fact, it is difficult to balance the role of student and mother, because both are time-demanding. Women prefer to delay motherhood until they finish school. Moreover, nowadays education has become more and more important and the costs of dropping out of school are increasing. This means that there exist conflicting time commitments between women's roles as students and mothers (Rindfuss *et al.*, 1988) as well as normative expectations that young women who attend school are not at risk of entering into parenthood. Finishing education, as one of the important steps for entering into the adulthood status (Oppenheimer, 1988), thus leads to a steep rise in the rate of entering into parenthood.

Nevertheless, tertiary educated women have less propensity to become mother in Bulgaria, Belgium, Estonia, France (both waves), Georgia (both waves), Lithuania (both waves), Poland, Romania, Russia, Sweden, the Netherlands, even after controlled for being student. These results show that postponement effect of being a student is not the only relevant a factor in delaying fertility produced by education (Bratti, Tatsiramos, 2012) and they support our first hypothesis for which higher educated women postpone first childbirth probably in order to achieve higher positions in the labour market.

2.3.2 Higher order births

For the transition to higher order births, second and third births, we found a different educational gradient than first birth rates.

Concerning the transition to the second childbirth, the first table (Table 11) shows the results for education when the model is controlled only for cohorts. Before controlling for being enrolled in education, higher educated women show lower propensity to have the second child in Bulgaria, Estonia, Georgia, Lithuania, Poland and Russia, compared to medium education. By contrast, in Belgium, France, Germany, Hungary, Italy and Sweden they are associated with higher level of propensity to the second childbirth. In the Czech Republic and in the Netherlands the difference among higher educated and secondary educated women is not statistically significant. Lower educated women are associated with higher level of fertility in all countries compared to the reference category (medium education), aside in Belgium and in Lithuania where the coefficient is not significant. It seems that there is a strong difference among Western and Eastern Europe. In fact, Eastern Europe is characterised by a negative association between women's education and second births. In these countries, higher propensity to second childbearing can be found among women with low education, while women's high education is associated with low second-birth outcomes. By contrast, Western Europe is less homogenous: France, Italy and Germany display a U-shaped relationship, with both high and low education associated with increased propensity to second birth. In Sweden, higher risk can be found only among higher educated women, compared to medium education and in Belgium, the difference between primary and

secondary education is not statistically significant; while tertiary education is associated with higher propensity to second childbearing.

Table 11 Model 1: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Modello 1		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	-0.1	0.613***	0.189***	0.152***	0.219***	0.141**	0.271***	0.092***
	se	0.068	0.045	0.068	0.049	0.069	0.068	0.042	0.029
High educ.	coeff	0.246***	-0.348***	-0.124**	0.157***	-0.289***	0.119**	0.129***	0.098**
	se	0.061	0.05	0.049	0.052	0.046	0.054	0.05	0.042

Table 1 of 2

Modello 1		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.072	0.262***	0.439***	0.318***	-0.145**	0.183***	-0.093*
	se	0.084	0.046	0.046	0.073	0.071	0.061	0.054
High educ.	coeff	-0.129**	-0.320***	-0.417***	-0.184***	0.104**	-0.117	-0.001
	se	0.059	0.051	0.095	0.043	0.042	0.075	0.059

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Similar results are showed in the model 1 for the second wave (Table 12): second childbearing is lower among women with high education in Bulgaria, Lithuania and Georgia, while women's high education is associated with low second-birth outcomes. In Germany there is no difference both for higher and lower educated women compared to the reference category. However, again, we have outlined that the second wave of GGS for Germany is affected by several problems due to attrition and, consequently, to response rate.

Table 12 Model 1: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Model 2		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	0.520***	0.183	0.153**	0.152*	0.092***	0.054	0.174*	0.236***
	se	0.049	0.117	0.062	0.089	0.029	0.108	0.102	0.075
High educ.	coeff	-0.322***	0.068	0.195***	0.179***	0.098**	-0.337***	0.026	-0.331***
	se	0.055	0.079	0.06	0.065	0.042	0.105	0.106	0.049

* p<0.05, ** p<0.01, *** p<0.001

The difference between Eastern and Western countries remains even after controlling for being enrolled in education. All higher educated women in Eastern countries experience lower propensity to second childbearing (aside the Czech

Republic where the coefficient is not significant and in Hungary where it is positive).

Similar results are showed in the model 2 (Table 13 and 14), controlled for being enrolled in education for the second wave: transition to the second childbirth is lower among women with high education in Bulgaria, Lithuania and Georgia, while higher educated women are associated with low second-birth outcomes. Western Countries also show similar coefficients with this particular U-shaped relation between education and fertility. As we outlined in the previous sections, enrolment has a stronger impact on the transition to motherhood rather than the transition to second childbearing.

Table 13 Model 2: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Model 2		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	-0.103	0.612***	0.186***	0.155***	0.205***	0.141**	0.268***	0.092***
	se	0.068	0.045	0.068	0.05	0.069	0.068	0.042	0.029
High educ.	coeff	0.252***	-0.341***	-0.112**	0.154***	-0.249***	0.118**	0.182***	0.107**
	se	0.061	0.052	0.051	0.052	0.048	0.055	0.052	0.044

Table 1 of 2

Model 2		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.071	0.254***	0.432***	0.316***	-0.164**	0.174***	-0.096*
	se	0.084	0.046	0.046	0.073	0.072	0.061	0.054
High educ.	coeff	-0.128**	-0.274***	-0.386***	-0.175***	0.118***	-0.079	0.021
	se	0.061	0.055	0.097	0.044	0.043	0.078	0.06

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 14 Model 2: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Model 2		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	0.518***	0.181	0.156**	0.151*	0.092***	0.041	0.172*	0.217***
	se	0.05	0.117	0.062	0.089	0.029	0.108	0.102	0.075
High educ.	coeff	-0.312***	0.079	0.190***	0.181***	0.107**	-0.313***	0.05	-0.279***
	se	0.059	0.08	0.06	0.068	0.044	0.108	0.109	0.05

The third model is the most interesting one, we added as a control the variable age at first childbirth. As we outlined in the previous sections, this variable can capture the potential catch up effect for higher educated women. The results for the first wave are shown in the Table 15. In general, we can easily observe again a strong difference between Eastern and Western countries. The former ones suggest that higher educated women have lesser propensity to second childbearing, while

primary educated women experience higher level of this propensity. The latter ones show another scenario: for example, in Belgium, in Sweden, in The Netherlands and in Italy, more educated women accelerate the transition to second childbirth, while for lower educated women the coefficient is negative (no difference in Italy between low and medium education). Though, we have to outline that Hungary and the Czech Republic stand out among Eastern European countries, because both higher educated women and lower educated women experience higher propensity to second childbearing.

Table 15 Model 3: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Model 3		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	-0.123*	0.556***	0.136**	0.115**	0.151**	0.148**	0.220***	0.033
	se	0.068	0.045	0.068	0.05	0.069	0.068	0.042	0.03
High educ.	coeff	0.360***	-0.201***	-0.028	0.275***	-0.109**	0.194***	0.319***	0.199***
	se	0.064	0.054	0.052	0.053	0.05	0.056	0.055	0.044

Table 1 of 2

Model 3		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.045	0.197***	0.376***	0.293***	-0.175**	0.128**	-0.186***
	se	0.084	0.046	0.046	0.073	0.072	0.061	0.056
High educ.	coeff	-0.049	-0.047	-0.135	-0.103**	0.138***	0.151*	0.149**
	se	0.062	0.058	0.1	0.045	0.044	0.08	0.062

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Controlling for age at first childbirth, the third model for the second wave shows analogous results as the first wave (Table 16). Due to sample size reasons, the coefficient among lower educated in Lithuania, the Czech Republic and Germany is not significant. However, the pattern for which there is a difference between Eastern and Western Europe is still valid: Georgia and Bulgaria display negative coefficient for higher educated women and positive one for lower educated women; while in France and in Germany the coefficient is positive and statistically among tertiary educated women compared to secondary education.

Table 16 Model 3: Hazard models for the Second childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Model 3		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	0.473***	0.15	0.112*	0.099	0.033	0.029	0.147	0.124*
	se	0.05	0.118	0.062	0.09	0.03	0.109	0.102	0.075
High educ.	coeff	-0.196***	0.145*	0.329***	0.279***	0.199***	-0.208*	0.262**	-0.126**
	se	0.06	0.083	0.062	0.071	0.044	0.11	0.113	0.052

* p<0.05, ** p<0.01, *** p<0.001

Analysing the transition to the third childbirth, we applied the same method as the second one. It is important to outline that this sample is particularly small because we analysed only women who had the second child, so caution in interpretation is needed for the following models.

The first model is controlled only for cohorts both for first and second wave. Table 17 and 18 show the results for the first wave and, similarly to the transition to second childbirth, Eastern Europe show negative coefficients among the higher educated women and positive one among the lower educated. Western European countries are less homogenous: U-shaped relationship is found in Belgium and Italy, while there is no statistical difference between tertiary and secondary education in France, Germany and Sweden. The Netherlands shows no difference at all probably due to the sample size.

Table 17 Model 1: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Model 1		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	0.592***	1.829***	0.548***	0.494***	0.641***	0.397***	0.852***	0.457***
	se	0.106	0.117	0.107	0.072	0.089	0.109	0.073	0.061
High educ.	coeff	0.508***	-0.383*	-0.364***	-0.023	-0.515***	-0.039	0.015	0.255***
	se	0.102	0.217	0.098	0.086	0.087	0.101	0.107	0.095

Table 1 of 2

Model 1		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.440***	0.370***	1.262***	0.472***	0.288***	0.613***	0.004
	se	0.15	0.051	0.089	0.124	0.1	0.106	0.087
High educ.	coeff	-0.247*	-0.443***	-0.817**	-0.343***	0.015	-0.407**	-0.127
	se	0.133	0.088	0.325	0.09	0.066	0.193	0.1

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 18 Model 1: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Model 1		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	2.017***	0.356*	0.538***	1.193***	0.457***	0.193	0.754***	0.640***
	se	0.135	0.184	0.091	0.128	0.061	0.192	0.172	0.096
High educ.	coeff	-0.359	0.007	0.029	-0.042	0.255***	-0.567**	-0.527*	-0.462***
	se	0.253	0.14	0.102	0.134	0.095	0.239	0.283	0.089

* p<0.05, ** p<0.01, *** p<0.001

The second model is controlled also for being enrolled in education. As for the transition to the second parity, educational enrolment seems not to have a stronger impact on the transition to the third one. In fact, as we can observe, the coefficients between the first and the second model are very similar both for the first and the second wave in all countries selected (Table 19 and 20).

Table 19 Model 2: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Model 2		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	0.600***	1.836***	0.552***	0.511***	0.650***	0.398***	0.853***	0.456***
	se	0.106	0.117	0.107	0.073	0.089	0.109	0.073	0.061
High educ.	coeff	0.496***	-0.457**	-0.433***	-0.047	-0.543***	-0.042	0.006	0.225**
	se	0.103	0.226	0.1	0.087	0.089	0.102	0.108	0.096

Table 1 of 2

Model 2		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.447***	0.367***	1.259***	0.472***	0.296***	0.615***	0.004
	se	0.15	0.051	0.089	0.124	0.101	0.106	0.087
High educ.	coeff	-0.277**	-0.402***	-0.802**	-0.374***	0.008	-0.411**	-0.116
	se	0.136	0.093	0.326	0.091	0.067	0.193	0.101

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 20 Model 2: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79) and being enrolled in education (yes/no); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

Model 2		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	2.021***	0.362**	0.537***	1.222***	0.456***	0.198	0.773***	0.644***
	se	0.136	0.184	0.092	0.13	0.061	0.192	0.172	0.096
High educ.	coeff	-0.382	0.022	0.03	-0.093	0.225**	-0.576**	-0.627**	-0.470***
	se	0.264	0.14	0.102	0.139	0.096	0.24	0.29	0.09

* p<0.05, ** p<0.01, *** p<0.001

The third model, as for the transition to the second childbirth, includes as a control variable age at previous childbirth. In general, in all countries the variable

attenuates the negative effect of education among tertiary educated women. In countries where the coefficients are statistically significant can be noticed again a strong difference between Eastern Europe and Western Europe. In Estonia (both waves), Poland, Georgia and Russia lower educated women experience higher propensity to the third childbearing; while tertiary educated women are associated with a lower risk, as in the previous model. In these countries, women with high education do not accelerate the transition to the third childbirth (Table 21 and 22).

Table 21 Model 3: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for education is Medium. Source Istat FSS 2009, GGS 1st wave

Model 3		Belgium	Bulgaria	Estonia	France	Georgia	Germany	Hungary	Italy
Low educ.	coeff	0.481***	1.663***	0.442***	0.322***	0.561***	0.280**	0.699***	0.252***
	se	0.106	0.119	0.107	0.074	0.09	0.11	0.074	0.062
High educ.	coeff	0.649***	-0.029	-0.242**	0.243***	-0.347***	0.113	0.245**	0.483***
	se	0.104	0.233	0.103	0.089	0.091	0.102	0.111	0.098

Table 1 of 2

Model 3		Lithuania	Poland	Romania	Russia	Sweden	The Czech Republic	The Netherlands
Low educ.	coeff	0.359**	0.307***	1.088***	0.294**	0.181*	0.476***	-0.176**
	se	0.15	0.051	0.09	0.126	0.102	0.107	0.089
High educ.	coeff	-0.134	-0.206**	-0.43	-0.182**	0.175**	-0.101	0.145
	se	0.137	0.095	0.329	0.092	0.069	0.197	0.103

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 22 Model 3: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for education is Medium. Source Istat FSS 2009, GGS 2nd wave

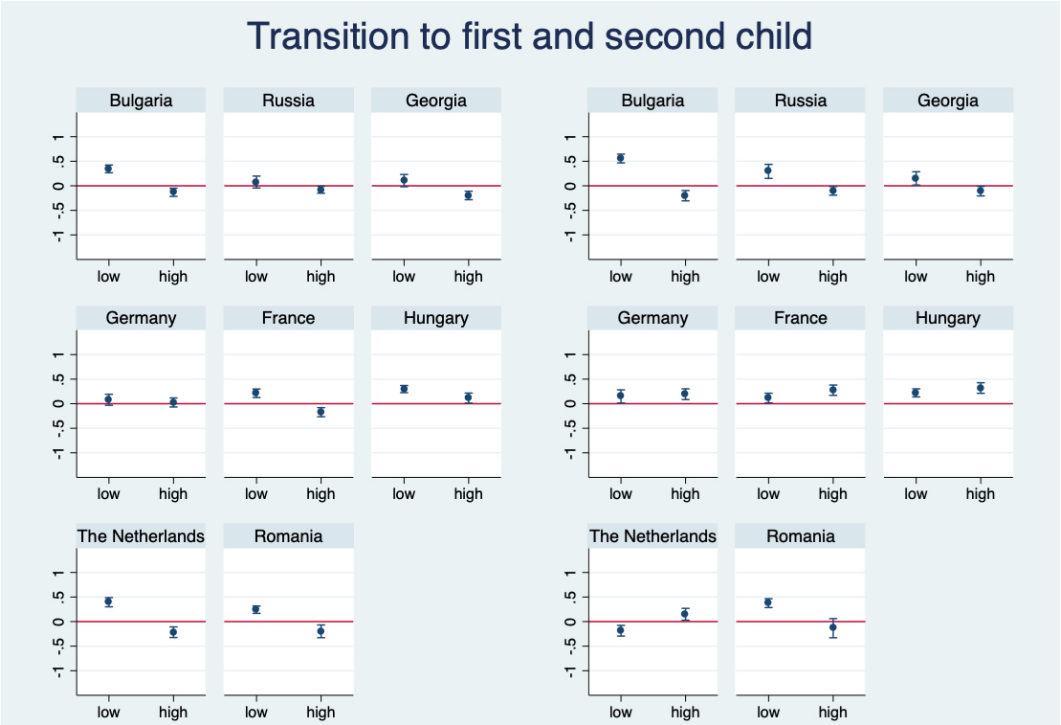
Model 3		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Low educ.	coeff	1.855***	0.258	0.377***	1.163***	0.252***	0.034	0.607***	0.533***
	se	0.138	0.187	0.093	0.129	0.062	0.195	0.174	0.097
High educ.	coeff	0.039	0.243*	0.336***	0.024	0.483***	-0.295	-0.281	-0.229**
	se	0.274	0.143	0.105	0.139	0.098	0.243	0.3	0.093

* p<0.05, ** p<0.01, *** p<0.001

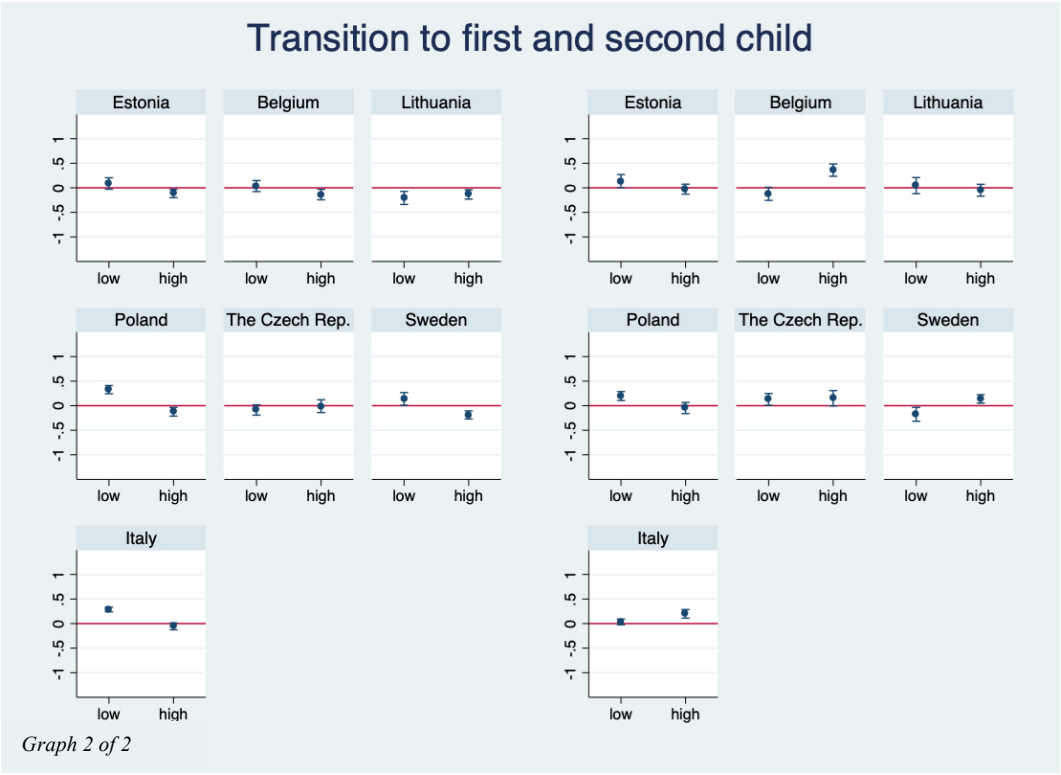
As we outlined, the most relevant difference is between the transition to motherhood and the transition to the second childbirth mainly due to sample size reasons, because women that experienced the third childbearing are a relatively small group compared with women that experience the transition to first and second childbirth. The following graphs summarise the result for both first and second wave. Thanks to these graphs, it is easier to show dissimilarities across countries both between transition to the first and second childbirth and among difference

levels of education. Once again, the picture that emerges emphasises the polarisation between Eastern and Western Europe.

Observing the first wave (Graph 9), in Bulgaria, Estonia, Lithuania, Georgia, Poland, Romania and Russia more educated women do not accelerate the second childbearing. Conversely, higher risk can be found among lower educated women.

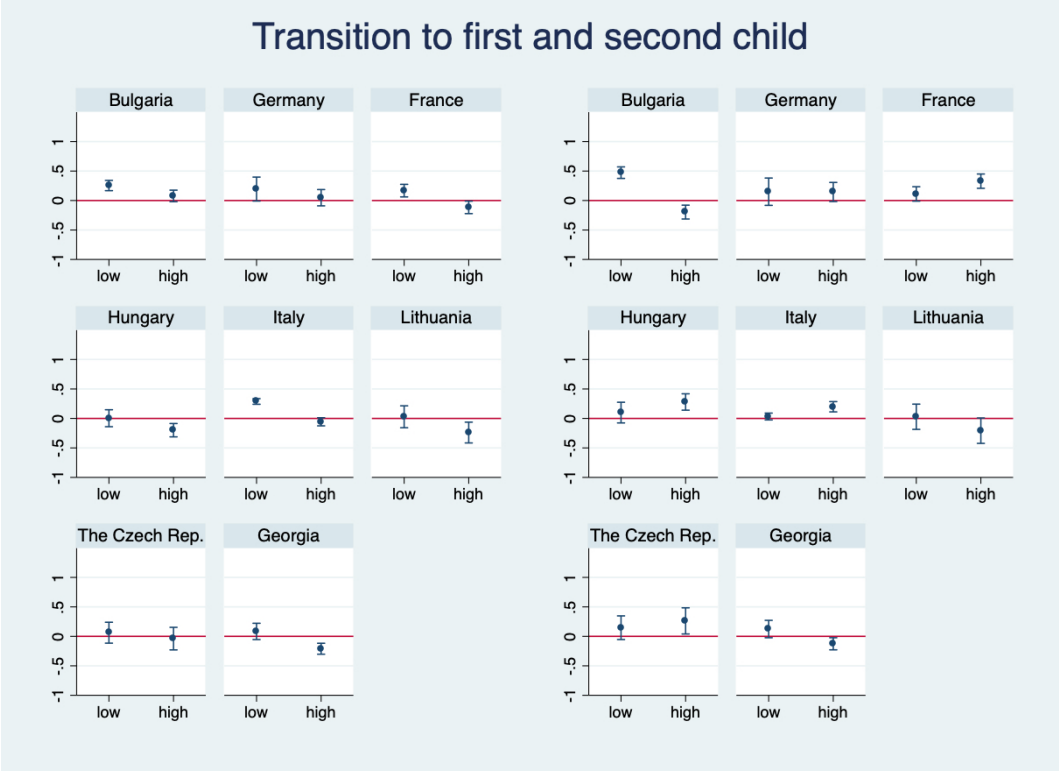


Graph 1 of 2



Graph 9 Log-hazard of having the first and second child, according to education. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old;26-30; 31-35; from 36 to max); the reference category for education is Medium. Confidence interval 95%. Source Istat FSS 2009, GGS 1st wave

Among Western European countries, tertiary educated women experience higher propensity to have the second childbearing compared to transition to motherhood in France, Germany, Sweden, the Netherlands and Italy. Moreover, in Belgium, France, Italy, Sweden and the Netherlands the relative risk for the more educated women turns positive after the introduction of all control variables; while in Germany, Hungary and the Czech Republic the negative effect of education on fertility is softened. Although Hungary and the Czech Republic belong to Eastern Europe, they stand out among this group, because higher educated women experience higher propensity to second childbearing than to motherhood. Second wave (Graph 10) shows similar results: concerning the transition to the second childbirth, the relative risk for more educated is positive in France and Italy and attenuated in Germany, Hungary and the Czech Republic. Higher education is again associated with low propensity to second parity in Bulgaria and Georgia.



Graph 10 Log-hazard of having the first and second child, according to education. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for education is Medium. Confidence interval 95%. Source Istat FSS 2009, GGS 2nd wave

These findings provide evidences for accepting both our first and second hypotheses. In fact, higher educated women postpone first childbirth or remain childless in order to achieve higher positions in the labour market. However, this negative effect is softened or even disappear after the first birth. Probably it is easier for tertiary educated women to balance work and family responsibilities. Our fourth hypothesis is partially confirmed. In fact, we have found a stronger negative educational gradient in Eastern Europe countries than in Western Europe countries. However, Hungary and the Czech Republic are considered an exception.

2.3.3 The interaction effects

The aim of this session is to present the result of the interaction effects. In order to answer the second hypothesis, we observe the interaction effect between education and woman's age at previous childbirth to capture the time-squeeze mechanism, for which higher educated accelerate the transition to second and third parity. The second interaction effect tests the third hypothesis and show the so-called cohort-

effect, according to which younger and more educated lead the revolution and experience higher propensity of experiencing the transition to the second and third child.

2.3.3.1 The interaction effect between education and woman's age at previous childbirth

As discussed in the previous sections, women with high education enter parenthood at a later age but tend to accelerate their progression to second and higher order births. Such a time-squeeze can produce a tempo effect and increase the transition rate to the second/third child among higher qualified women. To shed light on the role of time-squeeze we extended the third model both for transition to second and third birth, introducing an interaction effect respectively between women's age at first/second birth and education. Unfortunately, due to sample size reasons, in some countries the analysis does not give clear results and the coefficients are not statistically significant.

The following tables (Table 23 and 24), showing results for the transition to the second child, can be read both along the rows and the columns (Kreyenfeld, 2002). Firstly, we compare the relative risks of having the second child along the rows. Basically, fixing the level of education we can observe the effect of age at first childbirth across education, in particular we observe tertiary educated women.

Among higher educated women, Belgium and France show a similar pattern. These countries experience a catch-up effect for women that have had their first child until the age of 35. As it is shown in the table, the coefficients increase, passing from 0.24 to 0.43 in Belgium and from 0.16 to 0.42 in France in the first wave and from 0.14 to 0.8 in the second wave. The difference is not statistically significant for more educated women that have had first child after age 35, compared to secondary educated women. However, even if it is not significant, in Belgium women in the last group experience a risk of 0.7. In Germany (first wave) and Sweden, women who gave birth to their first child until at age 35 accelerate the transition to second childbirth; however, the risk is similar both for the group 25-30 and 30-35 (around 0.3 in Germany and around 0.27 in Sweden). However, the group of mothers that have had their first child at age over 35 in Sweden and in Germany in the second wave (like in Belgium) seems to accelerate the transition to the second birth, having a coefficient respectively of around 0.5 and 1.2. In Italy, tertiary educated women

experience increased risk of having the second child, passing from -0.001 (not significant) of the first group to 0.55 of the last group. In the Netherlands, the coefficients are not statistically significant (aside for the group 30-35), but the pattern shows an increased risk from the first to the last group.

Table 23 Hazard model for the Second childbirth with the interaction effect between age at first childbirth and education. The reference category for education is medium. The model is controlled also for cohorts and being enrolled in education. Source: Istat FSS2009, GGS 1st wave

	Belgium				Bulgaria				Estonia				France			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	-0.0633	-0.275*	-0.355	-0.209	0.543***	0.708***	0.525	-11.34	0.143*	0.153	-0.796	-13.55	0.196***	-0.181	0.0392	-0.13
High educ	0.237*	0.409***	0.431*	0.714	-0.316***	0.292*	0.0202	0.132	-0.0428	0.0375	-0.0612	-0.397	0.160*	0.307***	0.418*	0.297

Table 1 of 4

	Georgia				Germany				Hungary				Italy			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.133	0.168	0.791	-0.17	0.252**	-0.0519	-0.513	-0.925	0.257***	-0.225	-0.379	1.067	0.182***	-0.100*	-0.285**	-0.35
High educ	-0.205***	0.125	0.0204	-0.229	0.0375	0.335***	0.311*	0.0533	0.213**	0.430***	0.495	-0.445	-0.00818	0.0992	0.247**	0.551**

Table 2 of 4

	Lithuania				Poland				Romania				Russia			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	-0.0078	0.205	0.192	0.922	0.249***	-0.0458	-0.592	0.34	0.394***	0.174	0.593	0.367	0.284***	0.589***	-0.854	13.75
High educ	-0.0997	0.0396	0.105	0.547	-0.180*	-0.0148	0.29	0.612	-0.338*	0.064	-0.165	-13.28	-0.0942	0.211*	0.123	13.12

Table 3 of 4

	Sweden				The Czech Republic				The Netherlands			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	-0.113	-0.344*	-1.016*	-0.0527	0.134*	0.0402	0.338	-12.61	-0.169*	-0.173*	-0.294	-0.403
High educ	-0.0736	0.272***	0.264*	0.48	0.0323	0.383**	0.198	0.281	0.179	0.0382	0.275*	0.392

Table 4 of 4

* p<0.05, ** p<0.01, *** p<0.001

Table 24 Hazard model for the Second childbirth with the interaction effect between age at first childbirth and education. The reference category for education is medium. The model is controlled also for cohorts and being enrolled in education. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria				Germany				France				Hungary			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.465***	0.489*	0.435	1.391	0.134	-0.0197	0.345	0.961	0.165*	-0.113	0.265	-0.759	0.117	-0.167	0.232	2.208*
High educ	-0.316***	0.224	0.184	0.664	-0.152	0.384**	0.135	1.257*	0.138	0.367***	0.817***	-0.252	0.133	0.494***	0.505	-0.193

Table 1 of 2

	Italy				Lithuania				The Czech Republic				Georgia			
Age at first childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.182***	-0.100*	-0.285**	-0.35	0.03	0.0802	0.0397	-12.46	0.183	-0.365	0.263	-12.01	0.116	0.223	-0.223	0.942
High educ	-0.00818	0.0992	0.247**	0.551**	-0.278*	-0.0964	-0.266	0.518	0.125	0.468*	0.422	0.266	-0.200**	0.0234	-0.138	0.271

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

In Eastern European countries, the picture is less clear. In Estonia, Georgia, Russia, and Romania it seems that the catch-up effect does not happen. While in the Czech

Republic (both waves), Hungary (both waves) and in Bulgaria, women who have had their first parity at age 25-30 accelerate the transition to the second one, while the is not difference in the last two group, compared to secondary educated women that have had their first child at age 30-35 and over 35.

In Lithuania e in Poland, the coefficients are not statistically significant. However, in both countries, women experience increased risk, passing from about -0.01 of the women who have had their first child in a younger age to 0.06 of the women who have had experienced motherhood later.

Secondly, this table can be read also along column. In this way, we can compare the difference between the educational attainments, fixing the different age at first birth. Concerning Western European countries, Belgium, Italy, France, Sweden, the Netherlands show very similar patterns. In particular, in Belgium and in the Netherlands, primary educated women experience at every age at first child group a lower risk in the propensity to second childbearing compared to secondary educated women (even if some coefficients are not statistically significant, the pattern that they follow is quite clear). In France (both waves) and Sweden, similar coefficients can be found among the first group (14-25), while the other groups behave as the other Western European countries. Italy and Germany, more educated women who have had their first child at age 14-25 have a lower risk to their counterparts; while positive coefficients are shown in the other age groups for tertiary educated women compared to secondary and primary educated women. However, if graduation follows childbirth this result may be biased.

Concerning Eastern European countries, the picture is again less clear. Also due to sample size reasons that do not permit an evident interpretation, Georgia, the Czech Republic and Estonia do not show a pattern. In Hungary, only more educated women who have had the first child at between 25 and 35 years old accelerate the transition to second birth; while tertiary educated women who have become mother at older age do not have a higher risk compared to secondary and primary educated women. While in Romania, Russia and Bulgaria (both waves) higher educated experience lower risk to the transition to second childbearing compared to their counterparts (similar coefficients can be found in Russia, among the women that have their first child at older age. While in Bulgaria in the first wave the sample size is too small to observe the "oldest" group). Poland shows again not statistically significant coefficients. However, the pattern is very similar to Western European

countries and in particular to Italy and Germany: tertiary educated women who have had their first child at a younger age have a lower risk compared to their counterparts; while higher risk can be found in the other age groups among higher educated women compared to secondary and primary educated women. The pattern in Lithuania is not so evident, in the first wave it behaves in a similar way as Poland, but the second wave shows conflicting results. However, Lithuania, as we repeatedly highlighted, is affected by attrition in the second wave.

Following tables (Table 25 and 26) show the result concerning the interaction effect for the transition to the third childbirth both for the first and the second wave. The interaction effect is between the mother's age at second childbirth and her level of education. Even in this case, the tables can be read both along rows and columns (Kreyenfeld, 2002). Firstly, we compare the relative risks of having the third child along the rows, observing the effect of age at first childbirth across education. It is important to highlight again that the analysis on the transition to the third childbirth is conducted only among women who have had their second child. This selection implies a smaller sample size that, consequently, reduces the statistical significance.

Table 25 Hazard model for the Third childbirth with the interaction effect between age at first childbirth and education. The reference category for education is medium. The model is controlled also for cohorts and being enrolled in education. Source: Istat FSS 2009, GGS 1st wave

	Belgium				Bulgaria				Estonia				France			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.452**	0.615***	0.127	-0.548	1.669***	1.786***	1.525*	-13.94	0.487***	0.385*	0.209	0.123	0.353***	0.168	0.713**	0.636
High educ	0.25	0.810***	0.862***	0.637	0.159	-0.0257	-0.417	-14.1	-0.234	-0.285	-0.28	0.263	0.105	0.192	0.733**	-0.31

Table 1 of 4

	Georgia				Germany				Hungary				Italy			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.525***	1.210**	0.466	0.604	0.280*	0.238	0.309	-12.1	0.742***	0.630***	0.515	-12.87	0.375***	0.322***	-0.0757	-0.12
High educ	-0.385**	0.159	-0.697**	0.138	-0.0215	0.16	0.175	1.151	0.137	0.146	0.626*	0.625	0.416	0.557***	0.295	0.337

Table 2 of 4

	Lithuania				Poland				Romania				Russia			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.31	0.441	0.426	-0.234	0.326***	0.293**	0.245	-0.414	1.031***	1.175***	1.253***	1.553	0.309*	0.179	0.41	0.482
High educ	-0.363	0.0648	-0.299	-0.0862	-0.315	-0.102	-0.265	-1.173	-0.459	-0.458	-0.388	0.843	-0.206	-0.107	-0.313	-0.233

Table 3 of 4

	Sweden				The Czech Republic				The Netherlands			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.141	0.291	-0.617	1.400**	0.513***	0.378	0.372	-13.19	-0.169	-0.257	-0.113	-0.156
High educ	0.112	0.162	0.227	0.535	-0.509	0.221	-0.487	-13.41	-0.780*	0.208	0.369*	-0.257

Table 4 of 4

p<0.05, ** p<0.01, *** p<0.001

Concerning Western Europe countries: in France, in Germany (only second wave) and Belgium higher educated women accelerate the transition to the third childbearing if they have had their second child between age 30-35 in the first wave; while in the second wave, women in France accelerate the transition when their second birth was when they were at age 25-30. In Italy, the age in which mothers accelerate the third parity moves to 25-30. While, in Belgium the coefficient among women who have their second child at age 25-30 and 30-35 is similar, respectively 0.81 and 0.86. In Sweden, the coefficients are not significant; however, the risk seems increased, starting from 0.11 for the mothers who have had their second birth at age 14-25 to 0.5 for women who have experienced their second parity over the age 35.

Observing Eastern Europe countries, the pattern is not clear in the Czech Republic, Russia and Lithuania, where age at second childbirth seems to have no effect among higher educated women. While in Georgia, the risk of having the third child among tertiary educated women decreases when the second child is born at the

mother's age of 30-35. In Bulgaria and Poland, the coefficients due to sample size reasons are not statistically significant. However, among higher educated women, the risk of having the third child decreases as the mother's age at second child birth increases.

Table 26 Hazard model for the Third childbirth with the interaction effect between age at second childbirth and education. The reference category for education is medium. The model is controlled also for cohorts and being enrolled in education. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria				Germany				France				Hungary			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	1.851***	2.012***	1.614**	0.883	0.136	0.451	0.245	-12.2	0.386**	0.313*	0.397	0.891	1.125***	1.289***	1.208**	1.009
High educ	0.368	0.178	-1.529	-14.12	-0.195	0.129	0.725**	0.651	0.297	0.426**	0.292	-0.529	-0.384	0.247	-0.25	-13.01

Table 1 of 2

	Italy				Lithuania				The Czech Republic				Georgia			
Age at second childbirth	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+	14-25	25-30	30-35	35+
Low educ	0.375***	0.322***	-0.0757	-0.12	0.181	-0.474	0.835	14.72	0.645**	0.292	1.294	-13.21	0.479***	0.757***	1.091	-0.314
High educ	0.416	0.557***	0.295	0.337	-0.806	-0.0356	-0.302	-0.154	-0.442	-0.129	-0.00798	-13.53	-0.11	-0.386*	0.282	-14.49

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Secondly, as we did for the transition to second birth, this table can be read also along column, comparing the difference between the educational attainments.
The most interesting results can be found among Eastern Europe countries, that, in this case, are more homogenous. In general, the coefficients among lower educated women are higher compared to their counterparts. In particular, in Bulgaria (both wave), Poland, Georgia (both waves), the Czech Republic (both waves), Romania and Russia the risk of having the third child among primary educated women is higher than secondary and tertiary educated mothers in all age groups.

2.3.3.2 The interaction effect between education and cohorts

As we outlined in the previous sections, in order to understand if younger and more educated women experience higher level of fertility – and then if in this particular group the so-called gender revolution has advanced its status – we extended the third model, introducing an interaction effect between cohorts and education both for first and higher birth orders. For sample size reasons, in this case, we decided to modify the variable cohorts, reducing it into two modalities: younger cohorts and older cohorts, respectively women born from 1940 to 1959 and from 1960 to 1979.

Tables 27 and 28 show results for the transition to the first child. These table can be read both along columns and along rows. Firstly, we outline the difference between educational levels, observing the column controlled for cohorts.

If we observe the columns, countries are very homogenous: both in older and younger cohorts more educated women experience lower propensity to have the first child (in some countries the coefficients are not statistically significant, but the pattern is quite clear). Two exceptions stand out: Hungary and Lithuania (only the first wave), where among the cohort of women born between 1940 and 1959, primary educated women are associated with lower propensity to motherhood.

Secondly, we look at the rows, fixing the level of education we can observe the difference between older and younger cohort. In general, in all countries among lower educated women younger cohorts experience higher level of propensity to motherhood (Italy is an exception); while, among higher educated women younger cohorts are associated with lower propensity to motherhood. Similar and not significant coefficients can be found on higher educated women both for younger and older cohort in Belgium, Italy and the Czech Republic. Poland represents an exception, because among higher educated women, younger cohort experience higher propensity to the transition to the first child.

Table 27 Hazard model for the First childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for being enrolled in education. Source: Istat FSS 2009, GGS 1st wave

	Belgium		Bulgaria		Estonia		France		Georgia		Germany		Hungary	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	-0.0168	0.0535	0.265***	0.397***	0.0889	0.239*	0.192***	0.288***	-0.0195	0.260**	-0.0874	0.229**	0.205***	0.547***
High educ	-0.167	-0.128	-0.144*	-0.159**	-0.105	-0.228***	-0.0992	-0.250***	-0.176**	-0.207***	0.0652	-0.00639	0.255***	-0.0261

Table 1 of 2

	Italy		Lithuania		Poland		Romania		Russia		Sweden		The Czech Republic		The Netherlands	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.336***	0.226***	-0.258**	-0.0869	0.409***	0.475***	0.0980*	0.414***	0.033	0.19	0.154*	0.192	0.192	0.0551	0.428***	0.451***
High educ	-0.049	-0.0617	-0.0717	-0.186**	-0.398***	0.413***	-0.0958	-0.284**	0.0236	-0.182***	-0.206***	-0.192***	-0.192***	-0.127	-0.204**	-0.232**

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 28 Hazard model for the First childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for being enrolled in education. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria		Germany		France		Hungary		Italy		Lithuania		The Czech Republic		Georgia	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.173*	0.317***	0.0635	0.355*	0.168*	0.190*	-0.274	0.139	0.336***	0.226***	-0.0606	0.182	-0.0493	0.444**	0.0595	0.104
High educ	0.0822	0.0672	0.105	-0.0003	-0.0641	-0.161*	0.188	-0.280***	-0.049	-0.0617	-0.281*	-0.201	0.128	-0.172	-0.0807	-0.292***

* p<0.05, ** p<0.01, *** p<0.001

Following tables (Table 29 and 30) show the results for the transition to the second birth. These tables, as the previous one, can be read in two ways: along rows and along columns.

Looking at the rows, in Belgium, Italy and Sweden among higher educated women, younger cohort experience higher level of fertility compared to older one. Similar coefficient can be found in France, where the relative risk is respectively 0.3 for women born between 1940-1959 and 0.26 for women born between 1960-1979. Among lower educated women, in Sweden, in France and in Italy women born between 1960 and 1979 are associated with lower propensity to have the second child compared to the younger cohort (however, in Italy and in France the coefficient is not statistically significant). In Belgium, among primary educated women, the risk of having the second parity is higher for younger cohort compared to older one. While, in Germany, younger women both among higher educated and lower educated women do not accelerate the transition to the second child compared to women born between 1940 and 1959. Second wave shows similar results for all Western countries, aside for Germany among lower educated women. In fact, in the second wave younger cohort experience higher level of experiencing the transition to the second child.

Concerning Eastern European countries: in Russia, Romania, Poland and Bulgaria tertiary educated women experience higher propensity to have the second birth if they are born between 1940 and 1959 (in Poland the coefficient is not statistically significant).; while among lower educated a higher relative risk can be found in the younger cohort. In Hungary and in the Czech Republic, among higher educated women, higher risk can be found in the older cohorts as in the other Eastern European countries. However, also among primary educated women, older cohorts experience higher propensity to have the second child. In Estonia and Lithuania,

the pattern is not clear and seems that there is no difference among cohorts both for primary and for tertiary education.

Table 29 Hazard model for the Second childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for age at first childbirth and being enrolled in education. Source: Istat FSS 2009, GGS 1st wave

	Belgium		Bulgaria		Estonia		France		Georgia		Germany		Hungary	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	-0.201*	-0.0872	0.343***	0.684***	0.0981	0.079	0.130*	0.0945	0.109	0.102	0.217*	0.0867	0.404***	0.081
High educ	0.216*	0.457***	-0.0803	-0.280***	-0.0566	0.0641	0.296***	0.257***	-0.044	-0.188**	0.311***	0.0883	0.424***	0.260***

Table 1 of 2

	Italy		Lithuania		Poland		Romania		Russia		Sweden		The Czech Republic		The Netherlands	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.114**	-0.0577	0.00498	0.00564	0.176**	0.268**	0.325***	0.416***	0.177*	0.419**	-0.134	-0.328*	0.192*	0.0293	-0.160*	-0.118
High educ	0.1	0.283***	-0.00801	-0.0693	-0.196	-0.00943	0.0335	-0.325*	-0.0427	-0.190**	0.113	0.166**	0.226*	0.108	0.161	0.149

Table 2 of 2

* p<0.05, ** p<0.01, *** p<0.001

Reading the tables along the columns, the difference among Western and Eastern European countries emerge once again. In fact, both among younger and older cohorts in Belgium, Italy, Germany, Sweden and in the Netherlands, higher educated women are associated with higher propensity to have the second birth (in Germany no statistical difference among younger cohorts; wile in Italy the coefficient for tertiary education for the older cohort is not significant). Second wave for Germany shows different results: among younger cohort the coefficient is higher for low educated mothers than for their counterparts.

By contrast, both among younger and older cohorts, in Bulgaria, Poland, Romania, Russia, lower educated women experience higher relative risk to become mother for the second time. Hungary stands out among Eastern countries, because tertiary educated women have higher propensity to have the second child among women born between 60-79.

Table 30 Hazard model for the Second childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for age at first childbirth and being enrolled in education. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria		Germany		France		Hungary		Italy		Lithuania		The Czech Republic		Georgia	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.298***	0.591***	-0.0292	0.360*	0.124	0.111	-0.38	0.126	0.114**	-0.0577	-0.0784	0.164	0.231	-0.08	0.102	0.0356
High educ	-0.00074	-0.319***	0.269*	0.039	0.358***	0.321***	0.482**	0.278***	0.1	0.283***	-0.168	-0.234	0.266	0.296	-0.0626	-0.225**

* p<0.05, ** p<0.01, *** p<0.001

The interaction effect for the third childbirth is shown in the Table 31 and 32. The picture that emerges is very homogenous across countries. Observing the rows, in Estonia, Poland, Romania and Georgia (both waves) younger cohorts experience lower level of propensity to have their third child both among higher and lower educated women compared to their counterparts. While the opposite emerges in Bulgaria, Hungary and the Czech Republic where younger cohorts are associated to higher risk of having the third child both among primary and tertiary educated women for the first wave. In Russia, low education has a higher risk to have the third parity, while among tertiary education the pattern is not clear.

The second wave offers a more nuanced situation regarding low educated women: in fact, the coefficients are very similar, respectively about 1.29 for women born between 1940 and 1959 and 1.22 for those born between 1960 and 1979 in Hungary; while in the Czech Republic the coefficients are 0.58 and 0.59.

Concerning the Western European countries, similar patterns can be found in Italy and Germany where cohort born between 1960 and 1979 have higher propensity of having the third child only among higher educated women; while the one born between 1940 and 1959 experience higher risk to have the third childbirth only among primary educated women. However, coefficients for younger cohort in Germany are not statistically significant. The second wave for Germany is not consistent probably due to due to sample size as well as attrition.

In Belgium and France younger cohorts experience low level of propensity to have the third child both among low and high educated women. Although in France in the first wave, the coefficients among lower educated women are very similar; while in Belgium the two coefficients among higher educated are very similar (about 0.7 for women born between 1940 and 1960 and 0.6 for those born between

1960 and 1979). While in Sweden and the Netherlands younger cohorts are associated with higher risk to have the third parity both among primary and tertiary educated women (in the Netherlands no statistical significance can be found).

Reading the tables along the columns, in all Eastern countries (both waves) low educated women experience lower level of propensity to have the third childbirth compared to higher educated women both among younger and older cohorts. While Western European countries are more heterogenous: in Belgium and the Netherlands tertiary educated women experience higher risk to have the third parity both among young and older cohorts, although in the Netherlands the coefficients are not statistically significant. In Italy, women born between1940 and 1959 have higher risk to have the third child if they have primary education; while women born between 1960 and 1979 experience higher propensity if they have a tertiary education. The same pattern can be found in Germany if we observe the older cohorts; while the pattern is not clear among younger cohort, because the coefficients are not statistically significant. In Sweden and France (both waves) high education is associated to higher risk to have the third parity among older cohort; while the opposite can be found among younger cohort. However, both in France (first wave) and Sweden the older cohort have very similar coefficients for low and high education.

Table 31 Hazard model for the Third childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for age at first childbirth and being enrolled in education. Source: Istat FSS 2009, GGS 1st wave

	Belgium		Bulgaria		Estonia		France		Georgia		Germany		Hungary	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.563***	0.372*	1.366***	1.740***	1.285***	0.398*	0.330***	0.360**	0.256	-0.0191	0.859***	0.23	0.551***	0.828***
High educ	0.707***	0.596***	-0.249	0.101	-0.142	-0.330*	0.391**	0.0917	0.0894	-0.477***	-0.259*	0.155	0.146	0.347*

Table 1 of 2

	Italy		Lithuania		Poland		Romania		Russia		Sweden		The Czech Republic		The Netherlands	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	0.398***	0.0785	0.277	0.339	0.244***	0.00934	1.149***	0.915***	0.0393	0.500*	-0.0198	0.430*	0.307*	0.702***	-0.232*	-0.106
High educ	0.278	0.711***	-0.148	-0.0876	-0.134	-0.971***	-0.278	-0.797	-0.127	-0.292	0.0796	0.315**	-0.504	0.326	0.0253	0.25

Table 1 of 2

* p<0.05, ** p<0.01, *** p<0.001

Table 32 Hazard model for the Third childbirth with the interaction effect between cohorts and education. The reference category for education is medium. The model is controlled also for age at first childbirth and being enrolled in education. Source: Istat FSS 2009, GGS 2nd wave

	Bulgaria		Germany		France		Hungary		Italy		Lithuania		The Czech Republic		Georgia	
Cohorts	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79	40-59	60-79
Low educ	1.490***	1.982***	0.246	0.141	0.541***	0.211	1.281***	1.225***	0.398***	0.0785	0.272	-0.378	0.577**	0.599	0.688***	0.165
High educ	-0.441	0.312	0.221	0.294	0.656***	0.0847	-0.141	-0.0027	0.278	0.711***	-0.489	-0.153	-0.775	0.224	-0.363**	-0.15

* p<0.05, ** p<0.01, *** p<0.001

2.4 Discussion

In this chapter, we investigated the transition to first, second and third births across Europe, using Gender and Generation Survey and *Famiglia e Soggetti Sociali*. The focus of the study was on the association between women's educational attainment and the propensity to have the first, the second and the third child. To date only a few studies have explored the educational gradient in second and third births in a broad comparative perspective. To analyse the effect of educational attainment we estimated piecewise exponential models on the progression to first, second and third birth, respectively among first and second-time mothers.

Firstly, we want to stress some limitations of our analysis. The first one concerns the model: in fact, these models do not account for potential endogeneity. Potential endogeneity can be represented by unobserved characteristics and may, therefore, influence both educational career and fertility decisions. Without considering the endogeneity, the estimated coefficients for educational variables could also proxy for an individual's preference towards childbearing. Furthermore, the hazard of an event depends not only on observed characteristics but also on the hazard of another event: in this case, transition to first, second, and third childbirth. Multiprocess models can account for potential endogeneity of education on fertility behaviour. However, this strategy is rarely adopted, and the results show that the endogeneity in the relationship with education and fertility does not emerge as a relevant characteristic (Impicciatore, Dalla Zuanna, 2016).

Focusing on data limitations, it should be outlined that the finding of a positive gradient of education on second and third birth risk may just be the result of unavailable information on variables found to be important by other researchers in this context such as partner's characteristics. For example, partner's education plays

an important role in fertility behaviours and having a birth is a couple's decision (Beckman, 1983; Kreyenfeld, 2002; Rosina, Testa, 2009). Unfortunately, retrospective life course information about previous partners was not included in the survey so that we cannot account for this information in our models. There is also a lack on other potentially relevant information such as the educational career pattern and area of education. Further analyses taking into account this additional information is required for a better understanding of the relationship between education and fertility. Furthermore, GGS survey (especially the second wave) focuses more on the Eastern countries than the Western ones. Besides, among the Western ones, only one country belongs to the Nordic model (Sweden) and one to the Southern model (Italy). In this way, it is not possible to give possible explanations relating to welfare regimes and observe in detail a convergence or a divergence among countries, limiting our description based on the differences between Eastern and Western European countries.

Moreover, this analysis does not consider the difference within countries and some researches have outlined the importance of distinguishing, for example, North and South in Italy (Impicciatore, Dalla Zuanna, 2016) and East and West for Germany (Kreyenfeld, 2004).

Notwithstanding these limitations, we believe that some important conclusions can be drawn from this study. Our results suggest that the impact of education levels on fertility behaviours has not lessened over time. Higher educated women postpone first childbirth or remain childless in order to achieve higher positions in the labour market and it seems that the conflict between career and family is more strongly felt among graduated women. This result is in line with the New Home Economics perspective proposed by Becker (1981), suggesting that a delayed motherhood is less costly for a woman's working career. However, among mothers, we found a positive educational gradient on the propensity to have an additional child, in particular in Western European countries. According to Hoem and colleagues (2001), the higher propensity to have another child among more educated women can be explained according to their better position in the labour market: it may be easier for graduated women to combine work and parenthood since they have more protective labour contracts. An alternative explanation refers to cultural aspects, for example Kravdal (2001) suggests that there is a movement towards more "childfriendly" preferences led by "cultural elites", for which more educated

individuals have started to more strongly appreciate the emotional returns of parenthood.

As we stressed repeatedly in this chapter, our results suggest relevant strong differences both across countries, in particular we observed a variance between Western and Eastern European countries, and cohorts. In general and with few exceptions, variations by cohort supports the idea that in Western countries both the decline and the turn-around in the level of fertility are driven by the same social group, the higher educated couples (Esping-Andersen, 2009; Esping-Andersen, Billar, 2015). It is particular evident in Belgium, Sweden, Italy for the transition to the second birth and in Sweden, Italy, The Netherlands and Germany for the transition to the third childbirth. In Belgium, among graduated women the coefficients for the transition to the third childbirth women born between 1940 and 1959 and those born between 1960 and 1979 are very similar. While in France the coefficients are similar for the transition to second parity; however, it seems that higher educated women born between 1960 and 1979 do not accelerate the transition to third child.

One possible explanation for this decline and subsequent turn-around in the level of fertility considers the idea of Incomplete Revolution (Esping-Andersen, 2009). In fact, women among the younger cohorts have higher possibilities to balance work and family and are more likely to have partners that adopt more egalitarianism norm, with whom share domestic and childcare tasks. In fact, the increased involvement of fathers in childcare results in a positive effect on higher parities by providing women with a greater potential to reconcile work and family. The higher propensity to have the second and third childbirth among more educated women in the younger cohorts in Western countries suggests that they are moving towards a more gender equity system where couples are dual-earner and they share home responsibilities. Conversely, in Eastern Europe the negative effect of education on the second and third childbirth may reflect the lower level of gender- equity and the more conservative attitudes toward the mothers' and wives' roles.

These results support partially our third hypothesis: there is a positive effect of higher levels of education on fertility among younger cohorts. However, this effect is found only in some countries, especially in the Western ones, suggesting that in this group the "revolution" has advanced its status; while in the Eastern Europe more educated women do not find a fertile ground at both institutional and couple

level to achieve their fertility desires. We believe that the greater difficulty of combining motherhood and paid employment in Eastern countries explain this pattern. However, other some additional mechanisms can be at work to account for the negative association between education and second childbearing observed among women in Eastern Europe. Aside from the difficulty of combining work and domestic responsibilities, which indeed constitutes a major constraint for women, other factors that play a role can be changing values, anomie, or economic uncertainty (Frejka, 2008; Perelli-Harris, 2008; Billingsley, 2011). One plausible explanation for the reverse association can be drawn from the theory of the value of children (Friedman *et al.*, 1994), which suggests that the incentive for parenthood may be stronger among women who perceive that their alternative pathways of self-realisation are stacked or less attractive. These women may seek uncertainty reduction through motherhood, which brings stability to the life course. In particular, it may be that a larger family plays a more prominent role in the lives of less educated women that encounter stronger difficulties in the labour market.

To conclude, this chapter sheds light on the relationship between education and fertility behaviours observing in particular the opposite thesis of NHE and SDT on one side, and Gender Revolution on the other one. If the results on the transition to the first child are more in line with the first explanations, that suggest a similar evolution toward “less family” scenario. Transition to second and third birth, by contrast, are more in line with Gender Revolution hypothesis. This revolution is probably at a more advantaged stage in Western European countries compared to Eastern ones, creating a polarisation for which more educated women have higher fertility rates in the West, whereas lower educated couples have higher fertility in the East, and this may lead to a widening of inequalities across European countries.

Third Chapter

The effect of employment on fertility: a cross-country comparison

Introduction

Women's fertility and employment choices have been widely studied in the demographic, economic, and sociological literature. In general, empirical studies for Western industrialised countries suggest that the two careers are in conflict, but that this conflict is weaker when there is an institutional support for employed parents, when the labour market stimulates female labour. Another factor that can help women to combine work and life is the social acceptance of working mothers: in fact, when it becomes a social norm the conflict between these two spheres decreases. These findings are consistent with the microeconomic theory of fertility and women's labour supply that presupposes women's fertility and employment choices to be determined mainly by opportunity costs. Recent micro-level research on post-socialist countries has challenged this prediction, however, by showing that working women in this part of Europe are not less likely to enter motherhood than those who do not have a job, even if the context is not so supportive in the implementation of family reconciliation policies. This may suggest that conditions for work and family reconciliation are not the only country-specific factors affecting women's fertility and employment behaviours; and that women's employment may be an essential facilitator of family formation in countries with longer histories of women's labour force participation, where these are accepted as income providers and where the male breadwinner model is not considered the only household model.

Then, the aim of this chapter is to evaluate the effect of being employed on the fertility choices of women born between 1940 and 1979, using data from the second wave of Generation and Gender surveys and *Famiglie e Soggetti Sociali* for Italy. To analyse the effect of employment, we estimated piecewise exponential models

on the progression to first, second and third birth among first and second-time mothers.

Our results show that the role of employment on fertility behaviours is significant and tends to have increasing relevance in the transition to second and third birth. In fact, on the one hand, in social democratic and post-socialist countries women who are employed tend to not postpone the transition to motherhood; while, on the other hand, among those who decide to become mothers, we found a negative effect of employment on the propensity to have a second child; a result that can be interpreted in terms of a lack of policies supporting working women in the conciliation between work and care duties. As we underlined, relevant countries differences emerge relating to the effect of employment both on becoming mother and having the second and third child. In particular, the negative effect is found in Italy and Hungary.

The sections of the chapter are organised as follows. In Sect. 3.1 we introduce and discuss the theoretical background related to the employment–fertility nexus in the literature, and we formulate our research hypotheses. In Sect. 3.2 we describe data and methods used in our analysis. In Sect. 3.3 we show the result of our models for transition to the first, second and third child. In Sect. 3.4, we provide some concluding remarks and discuss potential directions for future research.

3.1 Work and fertility

Women's fertility and employment choices have been widely studied in the demographic, economic, and sociological literature. In fact, female employment is considered a factor that exerts strong influence on fertility rate. Labour economists have chiefly been involved in numerous studies concerning the effect of employment on fertility. In particular, the fact that fertility exerts a negative influence on work-force participation is undoubted. Especially on women who have just become mother (Bernhardt, 1993). The "new" arrival led the mother both to reduce her labour supply and to bargain the time between work and childbearing. The result reflects the incompatibility between caring for children and participating in economically productive work, in particular in the industrialised societies (Brewster, Rindfuss, 2000). Furthermore, Ní Bhrolcháin (1986a) argues that it is not clear to what extent, female labour-force participation has a negative effect on

family size; however, the reverse effect is proved: in developed societies, children are a constraint on the labour market activity of their mothers.

Conversely, at macro level, the effect of employment on fertility is more controversial. Research shows that after the mid-80s, the association between employment and fertility changed from negative to positive (Ahn, Mira, 2002; Rindfuss *et al.*, 2003). They observe the correlation between the total fertility rate and female labour force participation, suggesting a change from negative and significant to positive and significant. Three are the possible explanations: the first one concerns the fact that when wage increases, women are more encouraged to enter in the labour market, inducing bot income effect and substitution effect. According to labour supply theory, when the salary increases so does the probability of an incrementation of labour supply at low wages; this because the substitution effect dominates over the income effect. In this scenario fertility would drop for new entrants as labour-supply increases from no work to full-time work; leading to a negative correlation between fertility and participation. However, at high levels of female wage, an additional increment in wage generates an income effect which results in an increased demand for children. An increase in wage for working women has an income effect only if wage increases under fixed hours restrictions; resulting in higher fertility level. The second explanation regards the availability of "formal" childcare. Women can reduce the incompatibility between work and childcare, using market childcare. With increased demand for jobs by women, jobs are more flexible combined with working from home.

Moreover, the price of childbearing depends less on the mother's wage and more on the price of market childcare. The last one is about the unemployment effects on fertility. Husbands' unemployment induces wives to participate in the labour market, to reduce the possible negative shock that involves their wage. Ahn and Mira (2002) argue that countries with lower female participation rates experience a higher incidence of households in the "zero-earnings" state, and this reduces fertility.

In contrast to Ahn and Mira (2002) and Rindfuss *et al.* (2003), Kögel (2004) does not find that the association between total fertility rate and female employment rate changes sign, from negative to positive, after the mid-1980s. He argues that the reversal in sign of cross-country association between fertility and employment is due to a combination of two factors. The presence of unmeasured country-specific

effects and country-heterogeneity in the magnitude of the negative time-series association between fertility and female employment (Kögel, 2004). Findings do not suggest show a change in sign; however, they show that the negative impact of labour force participation on fertility is softened.

At micro-level, the most common theoretical approach used to explain and to understand women's childbearing and employment choices is the microeconomic theory of fertility and women's labour supply, suggested by Mincer (1963) and Becker (1965). The theory of the allocation of time in Becker (1965) implies the importance of labour supply and fertility decisions. In this framework, fertility decision is viewed as an economic one, and that one of the costs of having a child is the forgone earnings of the person caring for the child at home, in most cases the mother. In the model of household behaviour, the family is maximising utility defined over market goods, leisure and child services. In the household the woman's time and market goods are used as inputs to produce child services and, consequently, the participation and the childbearing decisions are mutually exclusive. If the woman devotes most of her time to labour market, then she should decrease her leisure time and/or the number of children. One of the most important characteristics of this model is the so-called "role specialisation within a couple", which defines a situation in which a couple's utility is maximised if a man focuses in income provision and a woman devotes her time in domestic and childcare tasks. However, if woman shares her time between home and work, her employment brings additional income to household. In this scenario, the income effect facilitates childbearing among working women and motivates mothers to re-enter employment after the birth of a child. However, it was also highlighted that women are only "ancillary" income providers who enter the labour market if there are no young children at home. Consequently, opposed to men's, women's fertility and employment decisions depend additionally on opportunity costs (the price effect). The role specialisation model suggests that the price effect surpasses the income effect and subsequently support the idea that not only women's employment hinder childbearing, but also parenthood "threaten" mothers' employment.

Recently, the role specialisation assumption of the microeconomic model has been criticised, because women have increased their presence in the labour market all over Europe, minimising their child-related career interruptions (Oppenheimer, 1997).

Nowadays, women are becoming increasingly averse to leave their professional career for the purpose of having a child (Gutiérrez-Domènech, 2004). Instead, they implement behaviours with the intention to combine and balance work and family life, deciding the timing of the entry to motherhood and the sequencing of births and work episodes (Ní Bhrolcháin, 1986a, 1986b).

Consequently, it has been argued that in modern societies, the organisation of the household has been changing and women start to play an increasingly important role in contributing to the household budget (Cherlin, 2000; Stevenson, Wolfers, 2007; Raz-Yurovich, 2012). In this new scenario, the price effect of women's employment on fertility becomes less likely to surpass the income effect.

Besides, for women who are pursuing careers, time spent out of the labour force, mainly when it occurs early in a career track, negatively affects occupational advancement (Bielby, 1992; Rosenfeld, 1992; Rosenfeld, Spenner, 1992). One possible mechanism by which labour force participation may reduce fertility is by delaying the transition to parenthood: in Japan and the United States, research reveals that women who do not participate to labour market are less likely to postpone the transition to motherhood (Blau, Robins, 1988; Tsuya, Mason, 1995). This postponement can reflect the decision to consider the higher opportunity costs of childbearing especially among women with higher human capital (Rindfuss *et al.*, 1996). However, countries in which women's work is supported by welfare policies and mother's employment is socially accepted, experience an increase in the importance of women's economic role. Related to this, McDonald (2000a, 2000b) claims that in societies where the breadwinner model prevails, women have to decide between children and employment, which in turn leads to having fewer children and low fertility. He suggests in the societies that advance gender equity in social institutions related to the family, women and men are able to combine market employment with having children and fertility will be higher. The result is that if society removes or restricts structural obstacles through the provision of social organisation and support for families with children, women could be able to combine work with children. In this line, Chesnais (1996) and Esping-Andersen (2009) observe that if similar opportunity to women and men both in education and labour market participation are provided, women reduce the number of children that they could have because they have to assume the cost of child raising. An improvement in the childcare availability might reduce the incompatibility between

childbearing and female employment and enable woman to combine work and childrearing.

Matysiak and Vignoli (2008) observe at micro-level the presence of a negative impact of female employment on childbearing, for the majority of Western industrialised economies, suggesting a predominance of the price effect over the income effect.

If we distinguish between first child and higher childbirth order, they outline that the interrelationship between fertility and women's employment is particularly strong among mothers. The opportunity cost can be higher for mothers than for childless women. Another explanation can be traced back to the fact that after childbearing, women's position in labour market may be weaken and more vulnerable, with the consequent of the reduction of their bargaining at home (Neyer *et al.*, 2011). Other studies suggest that the negative impact of labour force participation on fertility is higher after the first birth, because women pay more attention on the conflict between work and child-rearing as they get older and gain experience with work and children (Stolzenberg, Waite, 1977). This "learning hypothesis" suggest that mothers are more aware about the balancing between work and life, when they have already experienced this conflict. Hoem and Hoem (1989) find similar result in Sweden: second and third birth risk is significantly lower among employed mothers than housewives.

Furthermore, the magnitude of the negative effect of women's employment on fertility varies across country contexts, depending on the opportunity costs in a given country.

In particular, Matysiak and Vignoli (2008) outline that women tend to postpone motherhood and avoid further childbearing, as well as to take more career breaks, in countries where mothers' employment is less supported at institutional level and less socially accepted, and where the labour market institutions are not aligned with mothers' needs (Gutiérrez-Domènech, 2004; Adserà, 2005; Del Boca *et al.*, 2005; Mills *et al.*, 2005). In particular, Southern European countries are the typical example of countries where the reconciliation of family life and paid work is difficult and where the conflict between women's paid work and fertility is particularly pronounced (Adserà, 2005; Boeri *et al.*, 2005). By contrast, recent research on post-socialist and social democratic countries on the relationship

between fertility and childbearing reveals that at micro-level employed women are at least as likely to give birth to the first child as the non-employed.

In the social-democratic welfare regime, the difficulties in combining employment and childrearing are reduced by relatively liberal attitudes towards working mothers: in fact, female's employment is socially accepted.

Concerning Eastern Europe, similar results can be found in East Germany (Kreyenfeld, 2004); in the Czech Republic (Kantorovà, 2004) and Poland (Matysiak, 2009).

These findings may seem counterintuitive for Eastern Europe countries, in fact after the fall of socialism policies that support working parents have suffered a decline (Stropnik, 2003; Saxonberg, Sirovatka, 2006; Szelewa, Polakowski, 2008).

Furthermore, many family- and labour market-policies are similar to Southern Europe ones, and cultural barriers to conciliation between work and family have been shown to be strong and comparable to Mediterranean countries (Matysiak, 2011; Thévenon, 2011). A study conducted by Lück and Hofäcker (2003), for example, reveals that attitudes towards working mothers in the post-socialist countries are relatively traditional when compared to the rest of Europe.

One possible explanation for these results can be found in the social norm that demands women to enter motherhood before age 30 (Perelli-Harris, 2005; Potancokova, 2009; Mynarska, 2010). Furthermore, in the socialist regime, the difficulty of combining work and family life is alleviated by low competition in the labour market and supported by the socialist ideology that promotes fertility and high women's employment.

Finally, in Eastern Europe countries women are seen as income providers and they are more integrated into the labour market than in Western Europe. This effect may be reinforced after EU integration, because family tries to achieve Western living standards, which are difficult to satisfy with just one salary.

The discrepancy in empirical findings between welfare state regimes needs a more in-depth investigation about the interrelationship between childbearing and women's labour supply and the role of women's employment for childbearing. To this end, we compare different European countries and in particular we observe the difference among those countries where family-policy, labour market-related, and cultural obstacles to work and family reconciliation are similarly strong but which differ in the economic organisation of the household. As we outlined, women's

economic roles are more socially accepted in Eastern European countries than in Western countries, particularly in Italy. Therefore, we do not limit our investigations to any particular parity, but we analyse women's employment choices around the first, the second and the third births. Adopting a life-course perspective, we observe how employment affects the entry to motherhood and subsequently observes how this transition influences mothers' decisions to have a second and third child.

Given the literature previously debated, we test three hypotheses:

H1) We expect a postponement of the entry into motherhood among employed women than among those who do not work.
H2) Since the difficulties with combining paid employment and childcare are stronger for mothers than childless women, we expect to find the impact of women's employment on second and third birth to be more pronounced than the effect of women's work on first birth.
H3) As regards as countries differences, we expect that the negative effect of women's employment on fertility emerges in Italy compared to other countries (post-socialist and social democratic welfare regimes), in particular when we observe the effect of being employed on the propensity to become mother.

3.2 Empirical Strategy

Our empirical analysis is based on the second wave of Gender and Generation Survey and, for Italy, on Famiglie e Soggetti Sociali, conducted in 2009. Conversely to the previous chapter (Chapter 2), we can use only the second wave, because it gathers information on job's careers: in particular, surveys provide information on employment histories recorded on a monthly basis. We considered eight jobs, observing the starting and the ending month and year.
As we underlined in the previous chapter, the second wave of GGS is affected by a falling in response rates and to attrition. In particular, Germany and Lithuania have respectively an overall response rate of about 32% and 23%. As we highlighted in the previous chapter, caution in interpretation is needed for these countries. Appendix II provides details about how the attrition is distributed and in particular

explains which main characteristics of individuals affect the attrition. While both surveys cover detailed information on women's fertility and employment histories recorded on a monthly basis, they also have some limitations that restrict our analytical strategy. First, neither of these surveys contain data on income from work. Hence, even though such data would be very useful for investigating the income effect of women's wages on fertility, we limited our analysis to investigating the interrelationship between women's employment and childbearing. Furthermore, we could not implement analyses at couple level because we do not have information about partner's employment histories and there is no information about unemployment spells, forcing us to analyse the interrelationship between fertility and women's employment status in general (employed versus not employed).

Finally, the datasets do not allow us to add some important control variables into our models, for example, the religiosity, which might be crucial overall in Italian and in Eastern Europe countries. In fact, both in the GGS and in the FSS this variable is not available.

The following sections describe our sample and the method that we used for this analysis.

3.2.1 Sample

The countries selected for this analysis are Bulgaria, France, Germany, Georgia, Hungary, Lithuania, the Czech Republic and Italy[8]. As we outlined in Chapter 2, the year of the interview is similar of all countries that we considered: in fact, data are gathered between 2007 and 2009 (Table 2, paragraph 2.2.1, Chapter 2).

Including all countries selected, from an initial sample of 69.719 women, we excluded from the analysis women born before 1940 and born after 1979 (n=17.107). Then we dropped cases with missing or misreported information on year of birth of children: for the first child we dropped 1392 observations, for the second child we deleted 697 cases and for the third one we excluded 150 cases. We decided to eliminate 506 cases for which the second/third child was born before the

[8] We decided to select these countries and eliminate Austria because has only cohorts born after 1960 (as in the first wave), Russia does not provide information about jobs and on age in which the respondent achieving the current education level and The Netherlands because it does not have information on the birth month of the children.

first/second one. Then we excluded twins: 480 cases. Moreover, we excluded 5 cases in which the data gathered for the mother shows that the year of birth of mothers occurs after the year of birth of their children. Finally, we excluded 43 cases for whom the childbirth occurred before the 14th birthday. Concerning education, we deleted 14 observations missed or misreported[9]. After controlled misreported and missing information up to start and end of eight jobs of our variable of interest, employment, we eliminated 270 cases[10]. After these selections, our sample totals 26,926 women.

Concerning higher order births, to analyse the transition to the second birth, we deleted 4646 cases of women who did not experience a first child during our observational period. As a result, for the second birth analysis, the sample totals 22,280 cases. We apply the same for the transition to the third birth, deleting 6.431 cases of women who did not have the second child. The total sample for the transition to the third childbirth is 15,849 respondents.

Table 33 Number of women selected for each parity. Source Istat FSS 2009, GGS 2nd wave

Parity	Number of women (N)
First	26,926
Second	22,280
Third	15,849

3.2.2 Variables

Our model contains three time-constant covariates and two time-varying covariates. To investigate the influence on first/second and third birth risks, we have selected the time-varying covariate being employed and enrolled in education, and as time-constant covariates we have chosen education, cohorts and age at first/second birth. In the following sessions, we describe the time-varying covariate employment. Both the description and our expectations about the influence of the other covariate on birth risk are explained in Chapter 2.

[9] As we did in Chapter 2.

[10] In the paragraph 3.2.2.1, we explain how we coded employment and why we deleted these observations.

3.2.2.1 Employment

As we already underlined, our variable of interest is employment. We decided to introduce employment as a time-varying variable, because both the second wave of GGS and FFS gather information about the month and the year in which individuals start and end their activities. When the information about the year was missing, we deleted the case; while when the information about the month was missing, we extracted a month randomly, paying attention about the coherence with the starting or ending date of the other activities. Moreover, when respondents answered the season instead of the exact month, we randomly chosen a month within that season (as we did for the other dates).

Finally, to avoid multiple splits in the model caused by the fact that one person can be employed in more than one activity simultaneously, we have entered the starting date of the following activity so that it is identical to the ending date of the previous one.

We observed the effect of being employed on fertility in order to answer our hypotheses: in fact, because of the difficulties to balance work and childcare, we expect that entry to motherhood is postponed among employed women and, moreover, the impact of employment can be stronger on the transition to second and third birth compared to motherhood.

3.2.3 Method

As we outlined in Chapter 2, we applied as a main technique the event history analysis and its advancements and also in this case we applied a particularly flexible approach, the piecewise constant exponential model, using STATA software. This model is a simple generalisation of the standard exponential model, estimating the shape of the hazard function (Blossfeld *et al.*, 2007; Mills, 2011). The procedure is similar to the one described in the previous chapter, after splitting the time axis into intervals, each period is treated as a "dummy variable", and the model estimates each dummy, which represents the function for that particular period. An advantage of this model is that we can consider women with a complete fertility history but also those interviewed before the end of their reproductive age (i.e., right-censored). As in the previous chapter, we decided to express all the dates in the data file in terms of months and years, and we decided to transform them into century

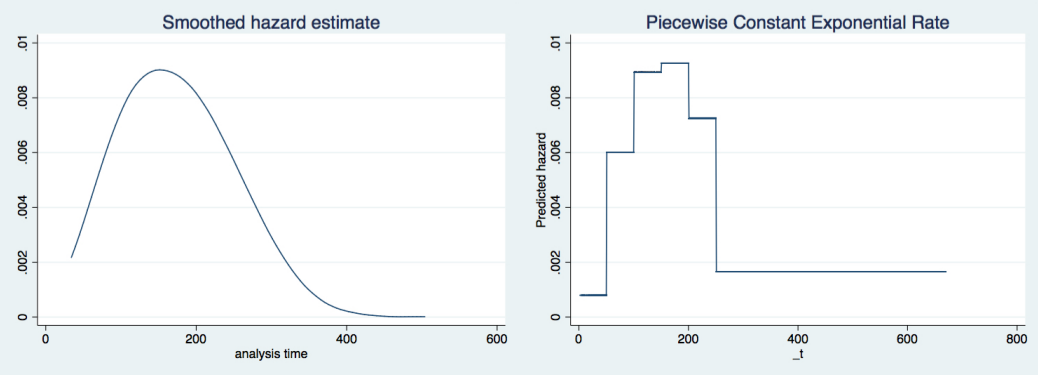
month codes. A century month code (CMC) is the number of the month since the start of the century (for example, January 1900 is CMC 1, following the formula CMC = ((YYYY-1900) * 12) + MM). In some cases, GGS gathers the season instead of the month of birth (Autumn, Winter, the end of Winter, the beginning of Winter, Spring and Summer), in these cases we have extracted a month randomly within the season. For the end of Winter, we decided to replace it with December, and for the beginning of Winter, we selected a month randomly between January and February, as suggested in the codebook.

The main events of interest are the transition to motherhood (transition to first birth) and to higher birth orders, until the transition to the third child. We selected women born from 1940 to 1979, and we included the effect of two time-varying variables: enrolled in education and, for the second wave, currently employed. Time-dependent variables are those where the values change over time. In our model, the time-varying variables are binary and vary discretely over time (0 and 1).

The transition to parities is observed in the same way as the Chapter 2 and we report here, for a more complete analysis, all graphs.

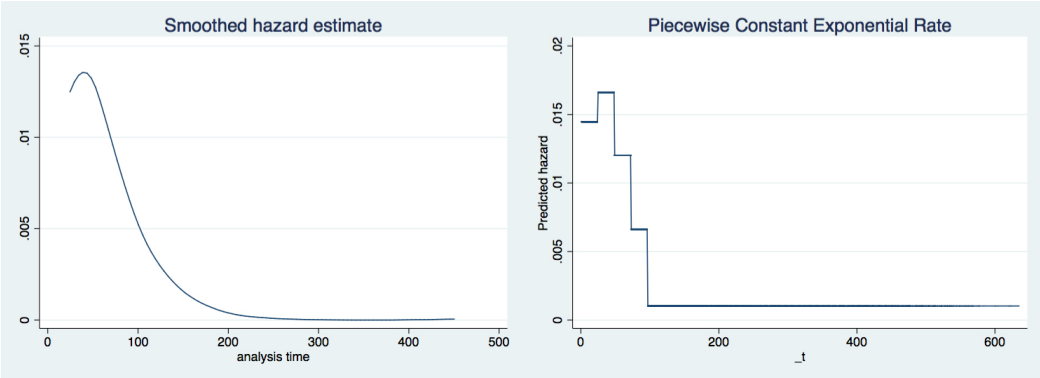
For the transition to the first parity, episodes begin at the 14th birthday and end with the birth of the first child (event occurred) or at the interview (the event is right-censored). The baseline is the woman's current age.

For the transition to the first birth, we divided the curve into 5 nodes (50, 100, 150, 200 and 250 that mean 18th, 22nd, 26th, 30th and 35th birthday starting from 14th birthday. The following graphs show the hazard estimate and the piecewise constant exponential rate (Graph 11).



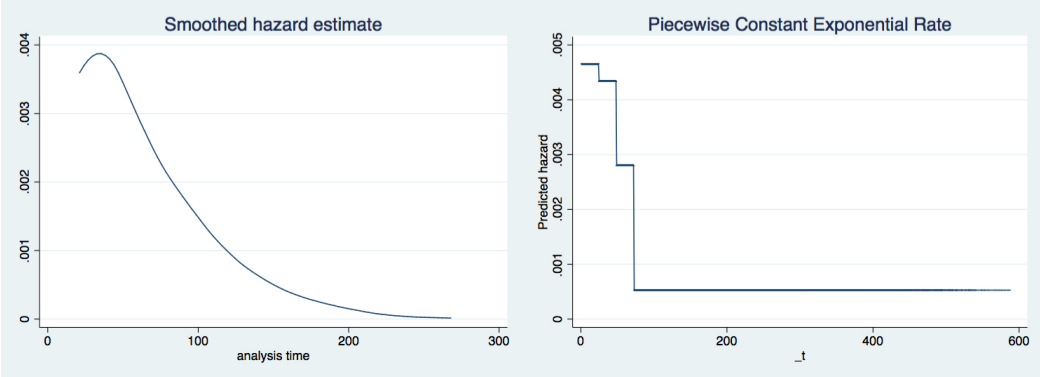
Graph 11 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the first birth in selected countries. Source: GGS 2nd wave and FSS 2009

For the transition to the second and third parity, episodes begin at the birth of the first (second) child and end with the birth of the second (third) child or at the interview. In this case, the baseline is the duration since the birth of the first (second) child. For the transition to the second birth, selecting 4 nodes, we have 5 intervals both for the first and second wave (24, 48, 72 and 96 months that are 2, 4, 6 and 8 years after the birth of the first child). Following graphs show both the hazard estimate and the piecewise constant exponential rate (Graphs 12 and 13).



Graph 12 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the second birth, in selected countries. Source: GGS 2nd wave and FSS 2009

For the transition to the third birth, we divided the curve into three nodes: 24, 48 and 72 months so 2, 4 and 6 years after the birth of the second child. Following graphs show the hazard estimate and the piecewise constant exponential rate graphs for both the first and second wave.



Graph 13 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the third birth in selected countries. Source: GGS 2nd wave and FSS 2009

For the purpose of our analysis, we decided to apply piecewise constant exponential models:

$$\log h^{(1)}{}_i\,(t) = \alpha_j + x_i\beta_1(t) + x_i\beta_2 + x_i\beta_3 + x_i\beta_4(t)$$

$$\log h^{(2)}{}_i\,(t) = \alpha_j + x_i\beta_1(t) + x_i\beta_2 + x_i\beta_3 + x_i\beta_4(t) + x_i\beta_5$$

$$\log h^{(3)}{}_i\,(t) = \alpha_j + x_i\beta_1(t) + x_i\beta_2 + x_i\beta_3 + x_i\beta_4(t) + x_i\beta_5$$

Where $\log h^{(j)}{}_i$ is the logarithm of the risk of having a j^{th} child at time *t* and α_j is the log of the baseline hazard.

In the model, we introduce two time-varying variables: employment $\beta_1(t)$, coded as a dummy (yes/no) and enrolled in education $\beta_4(t)$, as in the previous chapter, coded as a dummy (yes/no). We add also time-constant variables: cohorts (1940-1949; 1950-1959; 1960-1969; 1970-1979) and education (low, medium and high). Moreover, for the transition to the second and third child, we introduce the age at previous childbirth $x_i\beta_5$, divided into four categories (from minimum to 25 years old; 26-30; 31-35; from 36 to maximum. For the transition to the second child we consider the age of the mother at first child, and for the transition to the third child we include the age of the woman at the second child.

3.3 Empirical Results

We first discuss the results of the transition to motherhood, followed by a discussion about the findings for higher order births. For each parity, we refer to the models that we described in the previous sections. Overall, the effects of control variables tend to be in line with expectations; we only discuss in detail the variable of major interest for this paper: being employed. All complete models can be found in the Appendix IV, at the end of the thesis.

3.3.1 First child

Focusing on the propensity to have the first childbirth, estimates suggest that for Bulgaria, Germany, France, Lithuania and the Czech Republic the coefficient is not statistically significant; and there is no difference in entry into motherhood among employed women and among those who do not work. In Hungary and Italy, the scenario is completely different: in fact, women postpone the transition to motherhood if they are employed. Georgia stands out among Eastern European

countries because the coefficient is positive: employment exerts a positive effect on the transition to the first birth (Table 34).

Table 34 Model 1: Hazard models for the First childbirth. This model is also controlled for cohorts (divided in 40-49, 50-59, 60-69, 70-79), education (low, medium, high) and being enrolled in education (yes/no); the reference category for Employment is No. Source Istat FSS 2009, GGS 2nd wave

Model 3		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Employment	coeff	0.019	-0.016	0.166	-0.356***	-0.320***	0.055	0.224	0.636*
	se	0.069	0.1	0.184	0.084	0.022	0.184	0.307	0.26

* p<0.05, ** p<0.01, *** p<0.001

These results show that the effect of employment on having the first child is relevant and they partially support our first and third hypothesis for which employed women postpone first childbirth. In fact, in general the negative effect of women's employment on fertility is stronger in Italy, compared to other countries (post-socialist and social democratic welfare regimes). However, Hungary stands out among Eastern Europe countries, and the effect of being employed on motherhood is negative as in Italy.

3.3.2 Higher order births

For the transition to higher order births, second and third births, we found different results compared to the one to motherhood and the impact of employment emerge stronger. In fact, as the following table shows (Table 35), for what concerns the transition to second birth, in all countries – except the Czech Republic and Georgia, where there is no difference among women who are employed and those who are not employed – the coefficient is negative among occupied women. The transition to the second childbirth is experienced later among women who are employed in Bulgaria, Germany, France, Hungary, Italy, Lithuania; while the coefficients are not statistically significant in the Czech Republic and Georgia. Conversely to the previous chapter, where the variable "age at previous childbirth" caught up the effect for higher educated women on the propensity to the second childbearing in Western European countries, for what concerns the effect of employment, it seems that there are no substantial differences.

Table 35 Model 1: Hazard models for the Second childbirth. This model is also controlled for cohorts (divided in 40-49, 50-59, 60-69, 70-79), education (low, medium, high), being enrolled in

education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for Employment is No. Source Istat FSS 2009, GGS 2nd wave

Model 4		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Employment	coeff	-0.585***	-0.293*	-0.628***	-0.500***	-0.301***	-1.259***	-0.094	-0.017
	se	0.092	0.126	0.148	0.105	0.027	0.212	0.502	0.29

* p<0.05, ** p<0.01, *** p<0.001

These findings partially confirmed our expectations. These results suggest that impact of women's employment on second birth is more articulated than on the transition to motherhood. However, in the Czech Republic and Georgia, the coefficients are not statistically significant, and results show there is not an impact of employment on second parity. Although it is interesting to underline that in Georgia the effect of employment on the transition to motherhood is positive; while it becomes not significant for the transition to the second birth.

Analysing the transition to the third childbirth, it is necessary to highlight, also in this case, that this sample is particularly small because we are observing only women who already had the second child. So, caution in interpretation is needed for the following models. In particular, for countries where the attrition is very high: Germany, Lithuania and the Czech Republic (see Appendix II for more details).

The Model clearly shows that the negative effect of unemployment emerges only in Italy and in Lithuania. In all other countries being occupied has not any effect on the propensity of having the third childbirth (Table 36). These results do not confirm our hypothesis about the impact of women's employment on third birth. We expected it to be more negative than the effect of women's work on first birth.

Table 36 Model 1: Hazard models for the Third childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), education (low, medium, high), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for Employment is No. Source Istat FSS 2009, GGS 2nd wave

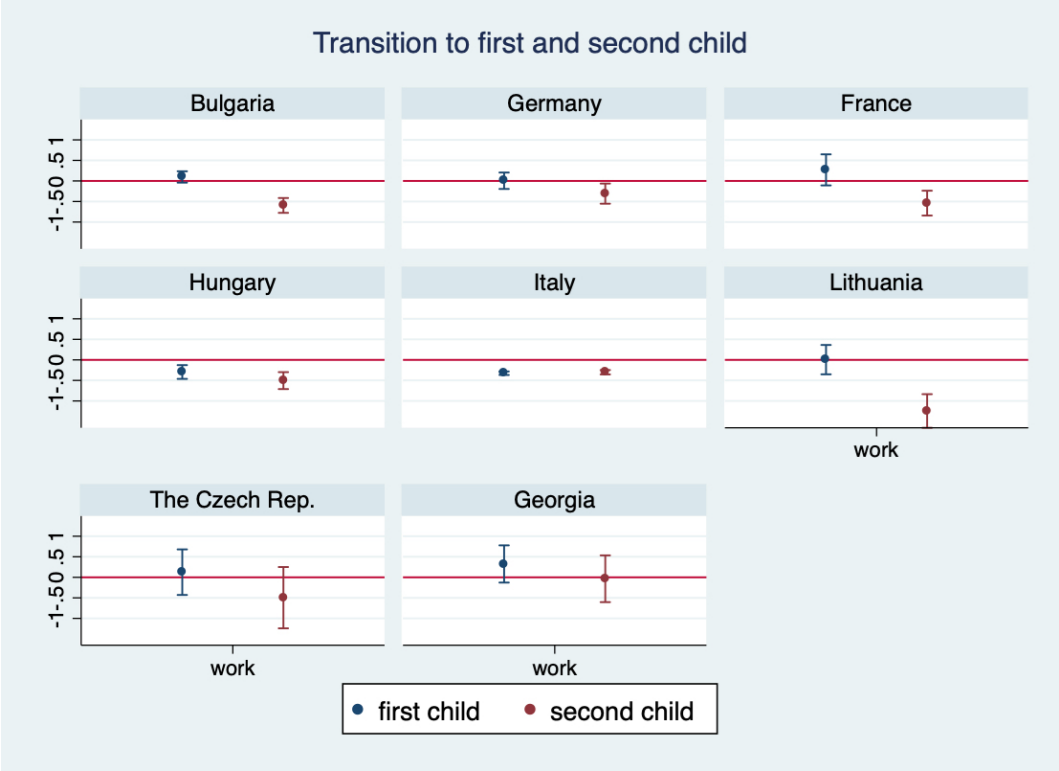
Model 4		Bulgaria	Germany	France	Hungary	Italy	Lithuania	The Czech Republic	Georgia
Employment	coeff	-0.33	0.108	-0.155	-0.301	-0.337***	-0.503*	0.019	-0.176
	se	0.225	0.239	0.167	0.182	0.055	0.256	0.715	0.271

* p<0.05, ** p<0.01, *** p<0.001

As we outlined, the most relevant difference is between the transition to motherhood and the one to the second childbirth mainly due to sample size reasons,

because women that experienced the third childbearing are a smaller group compared with women that experience the transition to first and second childbirth.

The following graphs summarise the outcome (Graph 14). Thanks to these graphs, it is easier to show relative risks of being employed, underlining differences both across countries and between parities. In fact, the relative risk for the transition to the first childbirth is not statistically significant in Bulgaria, Germany, France, Lithuania, The Czech Republic and it is even positive Georgia. While in Italy and Hungary, the coefficients are negative. These findings partially confirm our hypothesis: we expect that the negative effect of women's employment on fertility emerges in Italy compared to other countries (post-socialist and social democratic welfare regimes). The transition to second childbirth reveals different results: all countries – except Georgia and The Czech Republic, where the effect is not statistically significant – show a negative impact of being employed on the propensity to second parity. Indeed, among mothers, the effect of employment is more pronounced because mothers more than childless women can encounter difficulties to combine paid work, household and childcare task.



Graph 14 Transition to First and Second Childbirth. This model is controlled also for cohorts (divided in 40-49, 50-59, 60-69, 70-79), education (low, medium, high), being enrolled in education (yes/no) and age at first childbirth (from min to 25 years old; 26-30; 31-35; from 36 to max); the reference category for Employment is No. Confidence interval 95%. Source Istat FSS 2009, GGS 2nd wave

3.4 Discussion

In this chapter, we looked more closely to the relationship between fertility and employment in eight European countries, observing both the transition to motherhood and higher order birth. We use the second Gender and Generation Survey and *Famiglia e Soggetti Sociali* to test our hypotheses. To date only a few studies have explored at micro level the effect of employment on the propensity to have the first, the second and the third child in a comparative perspective. To analyse the effect of employment, we estimated piecewise exponential models on the progression to first, second and third birth, respectively among first and second-time mothers.

Firstly, we want to stress some limitations of our analysis. The first one concerns the model: in fact, these models do not account for potential endogeneity. Potential endogeneity represented by unobserved characteristics and may, therefore, influence both employment and fertility decisions. Without considering the endogeneity, the estimated coefficients for employment variables could also proxy

for an individual's preference towards childbearing. In fact, our study indicates that the change in the association between fertility and women's work is more ambiguous than what was found by the macro-level researchers. This underlines the necessity to a more in-depth investigation, possibly using more advanced statistical tools able to tackle the selectivity and endogeneity problems. Multiprocess models, for example, can account for potential endogeneity of being employed on fertility behaviour.

Focusing on data limitations, we could not introduce the economic situation of the household and partners' earnings or the labour market situation of the male partner. Consequently, we could not investigate how they affect women's childbearing behaviours. The results that we found about the effects of women's paid work on fertility can be affected by the lack of the couple level analysis. In particular, some studies underline the importance of taking into consideration the role of the partner involved in the reproductive process (Blossfeld *et al.*, 2001)

Furthermore, there is also a lack of other potentially relevant information such as income, the distinction between full-time and part-time jobs, religion and area of education. In fact, existing religious issues, legal issues, labour-market issues, educational opportunities also put constraints on female jobs (Rindfuss *et al.*, 2003). Furthermore, we stress the importance to include countries from different welfare state regimes, in particular from Nordic Europe and Southern Europe.

Notwithstanding these limitations, we believe that some important conclusions can be drawn from this study. In general, findings on the cross-country variation in the micro-level relationship between fertility and women's employment are only partly consistent with our expectations. On the one hand, our analysis conducted on women in post-socialist and social democratic welfare regimes countries show that being employed has no impact on motherhood and women are less likely to postpone the transition to the first child when are employed. On the other hand, in Italy (the only Southern Europe country that we have in our dataset) women have a higher risk to postpone motherhood when they are employed. The findings for the post-socialist countries about the transition to motherhood (in particular for Bulgaria, Lithuania and the Czech Republic) are in line with our hypothesis. In spite of the incompatibilities between fertility and women's labour supply, in that part of Europe these are exceptionally strong, our empirical results identify no significant negative relationship between employment and motherhood. One possible

explanation is that women in this part of Europe are strongly oriented towards participating in the labour force and may even perceive employment as a pre-condition to childbearing. Furthermore, the conflict between employment and family in social democratic welfare may be reduced by liberal attitudes towards working mother; while socialist regimes promotes low competition in the labour market, as we have underlined in the previous sections.

At the same time, negative impact on the transition to second birth may reflect the difficulties that women have in combining work and childcare for young children. The postponement of future childbearing is the result of a double expectation on women: earn income and at the same time combine work and care. The result is that they tend to postpone second childbearing. On the one hand, changing attitudes towards working mothers and new family policies aimed at work and family reconciliation; in many countries in the recent decades, this has improved the conditions for childbearing for working women; however, on the other hand, increasing competition in labour market and mobility create new constraints with the consequent of a decreasing in the possibilities of employment re-entry for mothers who exited from the labour market because of the maternity leave. The inability to find a job or return to work after birth may induce women to postpone childbearing until establishing again a relatively good position in the labour market. In this situation, women who want to have another child will self-select themselves into employment prior to childbearing.

Italian situation is even particular: women's employment clearly conflicts with childbearing, where women are more likely to postpone the transition to motherhood as well as transition to higher birth orders.

To conclude, this chapter sheds light on the relationship between employment and fertility behaviours observing in particular the opposite thesis found at macro level, about the fact that after the mid-80s, the association between employment and fertility changed from negative to positive. The result suggests a deeply difference across countries, opposing one the one hand post-socialist regimes and social democratic regimes and on the other hand, Southern Europe countries (represented in our sample only by Italy). However, more research is necessary to better understand the countries variation, in particular to perceive the Hungarian results for the transition to second birth. In general and to summarise, results regarding the transition to the first child suggest that post-socialist and social democratic regimes

countries support working women; while in Italy the effect of employment is negative. Findings on transition to second and third birth, by contrast, reveal that for working mothers is more difficult to combine work and childcare duties and therefore the risk of postponement is higher.

Fourth Chapter

Same effect but different future perspectives? How women's employment affects fertility in Italy and Hungary

Introduction

Sustained below-replacement fertility levels and the spread of the postponement of motherhood to advanced ages are topics that continue to be debated by demographers (Kohler *et al.,* 2002; Billari, Kohler, 2004; Sobotka, 2004; Coleman, 2006; Frejka, 2008; Goldstein *et al.,* 2009).

Although it is generally acknowledged that the postponement of childbearing is widespread across the Southern, Central, and Eastern European countries, many scholars have noted that there are clear differences between the countries with 'lowest-low' fertility, in both period total fertility and the mean age at first motherhood. Fertility rate shows that a few European countries are continuing to move in the direction of very low fertility, whereas others appear to be experiencing slight increases in fertility. Indeed, Italy is experiencing an increase, while it seems that in Hungary, low fertility persists. However, other measures such as the mean age of the mother at first birth predicts a postponement of fertility. As regards as the increase of the mean age at first birth, we observe the same trend both for Italy and Hungary. However, in Italy the intensity is much stronger than in Hungary.

The aim of this chapter is to investigate the relationship between female employment and education and between employment and cohorts' effect in these two European countries.

We have chosen these countries for a number of reasons. First, based on the results of the previous chapter, we find that conversely to other Eastern European countries, Hungarian women experience a less propensity to become mother as

the Italian ones. However, there is no difference between working and not working women in Hungary if we observe the transition to the third child.

The two countries are distinctive in several ways. As we suggested before, after falling to a very low level, fertility is rising again in Italy. In Hungary, by contrast, seems that there is no recovery. Moreover, we can observe some important differences between these two countries, in particular in labour market participation: as we underlined, despite the fact that combining family and work life is hard in both countries, employment seems to have a stronger effect in Italy than in Hungary in particular observing the transition to the third child. Moreover, the labour force participation of women is higher in Hungary than in Italy, and the age at first motherhood among Hungarian women is still lower than in Italy.

However, many aspects of the Italian and the Hungarian contexts are similar: both countries have similar cultural aspects, strong religiosity and family ties; and they both have similar institutional settings, in particular, a lack of public childcare services, and limited social benefits and housing subsidies (De Rose *et al.*, 2008; Spéder, Kamaràs, 2008).

Then, the aim of this chapter is to evaluate both the effect of employment and education and the effect of employment across cohorts on the fertility choices of women born between 1940 and 1979, using data from the second wave of Generation and Gender surveys for Hungary and *Famiglie e Soggetti Sociali* for Italy. To analyse these interaction effects, we based on the results found in Chapter 3 and we estimated the two interaction effects using piecewise exponential models on the progression to first, second and third birth among first and second-time mothers.

Our results show that the role of education on fertility behaviours is important when we observe the relationship between education and employment on fertility and tends to have an increasing relevance. As we underlined, relevant countries differences emerge both on becoming mother and having the second and third child. In particular, we found a positive effect of employment and higher education on the propensity to have the first child in Italy; while in Hungary the results suggest a negative trend. These findings can be interpreted in terms of the spread of gender egalitarianism norm that effects Italian tertiary educated women.

The sections of the chapter are organised as follows. In Sect. 4.1 we introduce and discuss the theoretical background related to differences and similarities between Hungary and Italy in terms of fertility, education and labour market participation, and we formulate our research hypotheses. In Sect. 4.2 we describe data and methods used in our analysis. In Sect. 4.3 we show the result of our models for transition to first, second and third child. In Sect. 4.4, we provide some concluding remarks and discuss potential directions for future research.

4.1 Italy and Hungary: The Background

The analysis of the main characteristics of the Italian and Hungarian contexts provides some similarities and differences between the two countries.

In the following session, we outline differences and similarities in terms of fertility trends, women's education, women's labour force participation and, finally, in terms of maternal and childcare policies.

In general, some demographic indicators are differentiated more by the influence of religious and cultural traditions than by the geographical position of the country (De Rose *et al.*, 2008). Observing the level of religiosity, the two countries belong to the group of traditionally Catholic countries, but Italy has a relatively high degree of religiosity; while Hungary has a high degree of secularisation (Sobotka *et al.*, 2003; Spéder, 2005). Despite the influence of the Catholic Church in Italy and Hungary, both countries have experienced a marked decline in fertility (Dalla Zuanna *et al.*, 2005).

However, in Italy the process of secularisation among younger cohorts is more pronounced than in older one (Matysiak, Vignoli, 2009), this change is reflected in an increase in divorce (Vignoli, Ferro, 2009) and cohabitation (Rosina, Fraboni, 2004; Gabrielli, Hoem, 2010).

In Hungary, the position of women has often been characterised by the lack of egalitarian ideology and by the persistence of religious and traditional stereotypes. Support for families provided by the State has conducted to an "idolisation of family", that implies the growth of a morality more similar to the orthodox Catholic one (Ferge, 1997). This led to the spread of cohabitation, seen as a trial period before marriage, since the 1990s (Sobotka, 2003; Spéder, 2005).

In general, the effects of careers on private life, including family and reproductive decisions, seem to be growing. In both countries, the goal of complete gender equality, at least from a legal standpoint, is far from being achieved. In addition, the system of social care is poor. The Italian system does not provide sufficient care services for families, which makes it difficult for women to continue to work after the birth of their first child or when elderly relatives require assistance. In Hungary, the behaviour of the youngest group of women appears to be the most sensitive to broad social and economic changes.

4.1.1 Developments in Fertility

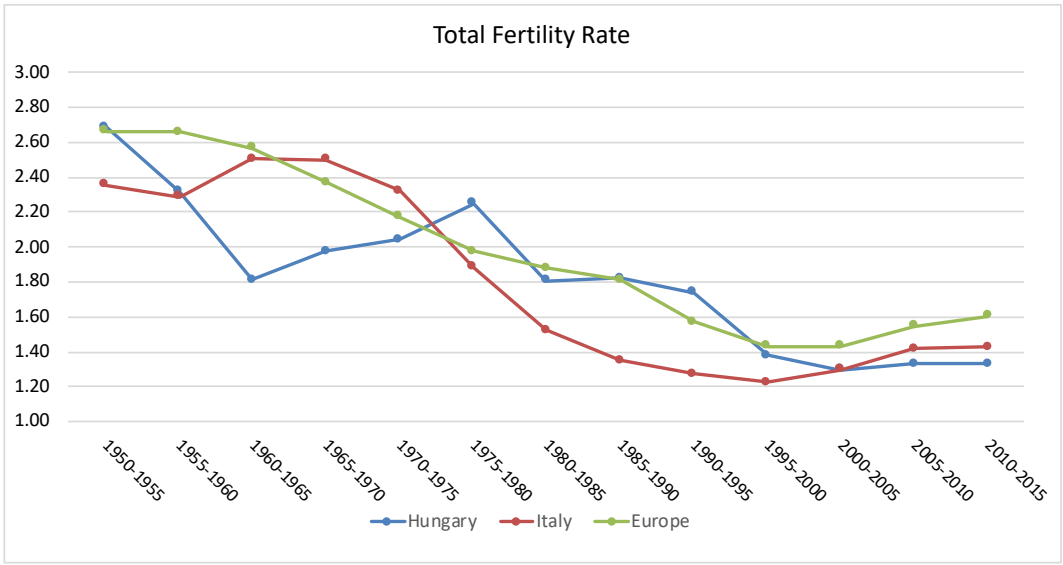
In the past decades, Hungary experienced fluctuations in fertility rate; however, these fluctuations show a decreasing trend. These variations can be attributed to two fundamental political changes during the second half of the twentieth century: the first one is the establishment of communism after the Second World War; the second one dates back to the end of the century and regards the political transformations to the market economy. In fact, Hungary is the first European country in which the total fertility rate fell below the replacement level immediately after the Second World War, and, except for a four- year period, fertility has remained below replacement level for the last 50 years. In the mid-1950s, Hungary experiences a baby boom, due to the prohibition on abortion that lasted for some years. Immediately after, fertility drops below 1.8 and at the beginning of the 1960s is the lowest in the world (together with Estonia). Policy measures, which resulted in an unexpected but temporary increase in fertility rates, contributed to the comparatively large size of the baby boom birth cohorts of the mid-1970s. In the 1980s, however, fertility rate decreases behind governmental expectations; however, it is above the average comparing European countries. From the beginning of the 1990s onwards, there is a significant and permanent fall from this level and fertility sinks below the “lowest-low” level of 1.3 (Graph 15).

Italy, immediately after the Second War World, experiences the so-called “economic miracle”, characterised by an increase in consumption and a reduction in unemployment. In this context emerges the “baby boom”, for which fertility rate reaches its highest levels. Between the 1960s and 1970s, some changes at societal level lead important transformations also at family level. The introduction of the

divorce rises, although slowly compared to the other European countries, new family models. In this period, fertility starts to decrease, and during the 1990s, the Italian total fertility rate drops to 1,28 in 1989 and 1,18 in 1995. After this negative peak, however, Italy have experienced a slight recovery (Graph 15).

This recovery can be associated to multiple factors: the first one, Italy in these last decades experiences an increase in migration (De Rose *et al.*, 2008); the second one, the number of de facto unions increase with the consequent that the number of children born in these stable couple but not sanctioned by marriage is increasing (De Rose, Dalla Zuanna, 2013). The third one can be connected to a more frequent recourse to adoptions and medically assisted procreation, in response to an increasing unsatisfied demand for children mainly resulting from postponing pregnancies (De Rose *et al.*, 2008; Rosina, De Rose, 2013).

Moreover, some policies adopted by Italian government stimulate fertility, in having an impact on the decision to have second and the third child. In particular, the "Turco Law" (Law number 448 of the Year 1998) introduces two policy measures, with the explicit aim of supporting incomes of poor households with children. The measures of the law are introduced in 1999: the first one provides monetary transfer to households with at least three children; while the second one, transfers cash to households in which one partner is unemployed (Billari *et al.*, 2005).



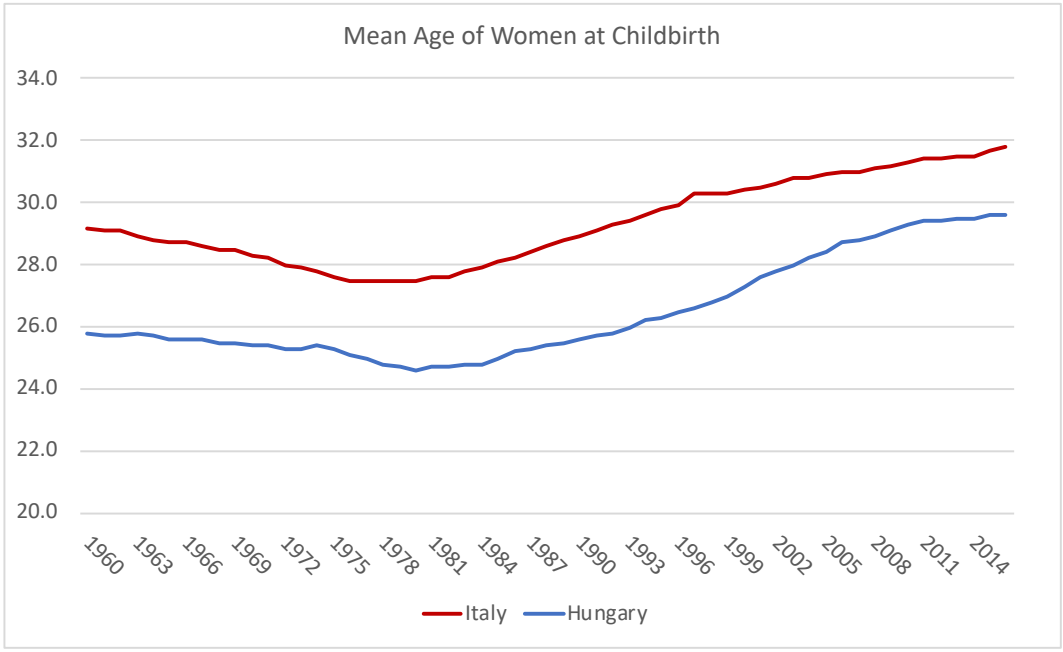
Graph 15 Fertility rate from World Bank Open Data. In particular, for Hungary and Italy: Eurostat

Persistent low and very low levels of period fertility is associated to the postponement of childbearing, which has gradually spread to all European countries. In fact, the impact of the increasing age at childbearing form an essential part of the explanation of lowest-low fertility. For example, high fertility of the "baby boom era" between the mid-1950s and the mid-1960s is in many European countries driven by the advancement of childbearing to younger ages of women (Sobotka, 2004). In this line, many researchers have demonstrated the effects of increasing age at childbearing on period fertility in developed countries (see e.g., Lesthaeghe, Willems, 1999; Philipov, Kohler, 2001; Bongaarts, 2002; Kohler *et al.*, 2002; Smallwood, 2002; Lutz *et al.*, 2003; Sobotka, 2003).

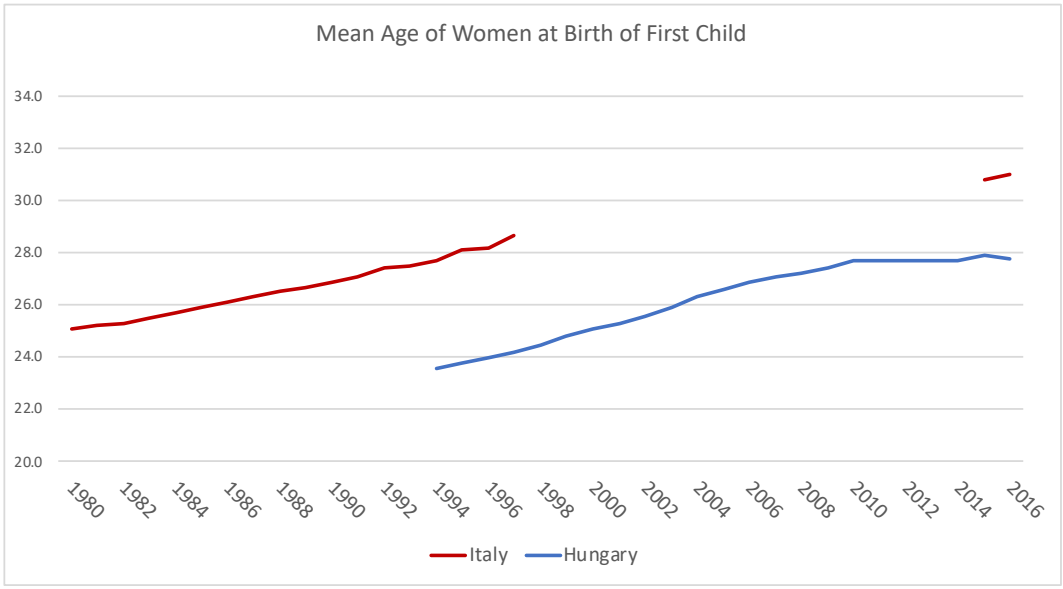
For a long time, Hungary is characterised by entry into motherhood at a young age. The mean age of mothers at birth was under 25 years in the 1970s. The dual-earner family with two children became the general model, which meant that women and couples basically realised their planned family size by the end of their twenties.

The signs of change are already evident in the 1980s. However, it becomes more explicit from the mid-1990s onwards, when the new phenomenon of delayed motherhood increases. This trend, in turn, negatively affected period fertility rates for the first time. Whereas during the 20 years between 1975 and 1995, the mean age of mothers at birth increased by only slightly more than one year, it rises by nearly three years during the following decade. In 2016, the mean age of mothers at the birth of their first child was 29.6 years and compared to 1994; and this age represents an increment of four years (Graph 16 and 17).

In Italy, from the 1960s to the early 1980s the average age at birth has decreased from about 29 years to about 27.5. The anticipation of entry into motherhood for the cohorts born during the 1930s is responsible for the raise in birth. Indeed, Barbagli and colleagues (2003) and Dalla Zuanna (2003) have suggested that the baby boom for these cohorts can be traced back more to a decrease in the age at birth than to a recovery of fertility. After this period in which the entry to motherhood is experienced at younger age, the mean age of women at first birth starts to increase in the mid-1980s. As in Hungary, even if signs of postponement are already evident in that years, the effects become clearer and stronger since the end of the 1980s. In 2016, the mean age of mothers at the birth of their first child was 31 years and compared to early1990s; and this age represents an increase of about four years (Graph 16 and 17).



Graph 16 Mean age of women at childbirth. Source: Eurostat from the National Statistical Institutes.



Graph 17 Mean Age of Women at birth of first child. Source: Eurostat from the National Statistical Institutes.

4.1.2 Women's education and labour force participation

In the literature, as we explained in Chapter 3, women's labour force participation is linked to the postponement of childbearing in several ways. From a micro-economic point of view, the decrease in fertility is attributed to an increase in women's education (Becker, 1973, 1981; Schultz, 1974; Sweeney, 2002). Women

who work have fewer children than women who are not in paid work. In other words, there is an incompatibility between female employment and family role.

The economic literature has also focused on the opportunity costs of having children, especially for women. Since raising children requires time, fertility is costlier for high-income mothers, who are therefore expected to have fewer children (e.g., Kravdal, 1992). A number of scholars have found evidence of a "motherhood wage penalty" and have observed that postponement provides considerable earnings returns for more highly educated women and for those in professional occupations (Amuedo-Dorantes, Kimmel, 2005; Gustafsson, Kalwij, 2006; Miller, 2011; Van Bavel 2010). Moreover, women who expect that their income will rise in the future tend to postpone motherhood until their income actually increases (Happel *et al.* 1984). The increase in female educational achievement has also contributed to a change in women's preference in the labour market, which has, in turn, resulted in a further postponement of childbearing (Rindfuss, Brauner-Otto, 2008). Furthermore, more educated women are likely to take on progressively higher levels of responsibility, and the acquisition of greater levels of autonomy will increase their earning power (Amuedo-Dorantes, Kimmel, 2005).

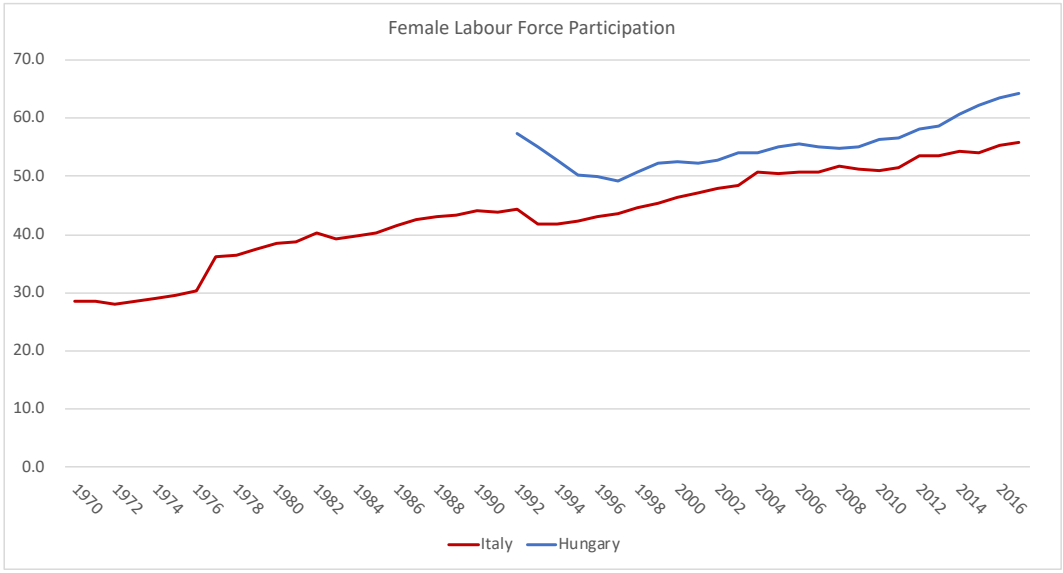
If we look at the other side of the employment phenomenon, that is unemployment; it is demonstrated that economic uncertainty and the spread of precarious works led to a postponement of entry into motherhood (Oppenheimer, 1988, 2003; Oppenheimer *et al.,* 1997). Furthermore, this negative effect can be mediated by the level of education. Lower educated women react to economic uncertainty by anticipating the entry into motherhood, while women with high level of education postpone the transition to first childbirth (Kreyenfeld, 2009). However, different gender systems and welfare regimes can produce different reactions among women across countries (Mills, Blossfeld, 2005).

At the macro-level studies on the relationship between fertility and labour supply have focused on the effect of female participation, the impact of uncertainty and unemployment, and the consequence of work-life balance policies, and especially of part-time work. As we mentioned in the previous chapter, recent researchers have shown the correlation between fertility and female labour force participation is becoming nowadays positive, compared to 1980s (Ahn, Mira, 2002; d'Addio, Mira d'Ercole, 2005). However, other studies have found that the effect is softened, but women's employment depresses fertility, in particular in Mediterranean countries

where social norms, culture and institutional settings have a negative effect on fertility behaviours as well as the perception of working women (Engelhardt *et al.,* 2004, Kögel 2004; de Laat, Sevilla-Sanz, 2011).

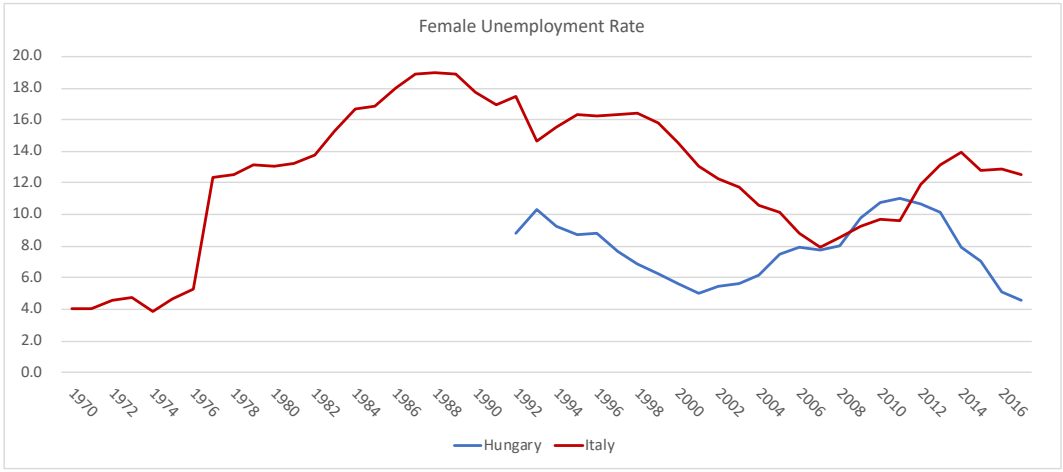
Differences among welfare regimes and policies, in fact, are important to understand the developments both in the labour market and fertility. Socialist regimes, for example, for more than four decades tried to reach full employment, social equality; by contrast, during the transition from socialist to post-socialist government, Hungary experienced a decline in employment, mainly due to two trends that happened in labour market over the 1990s. The first one concerns a crisis period, in which unemployed reaches a rate of 13.6% in 1993. The second one regards the high outflow activity during the 1990s, with a reduction in employment until 1997 (Busetta, Giambalvo, 2014). Italian labour market conditions remain highly regulated, even if some recent law, like "Biagi Law" (Law number 30 of the Year 2003) and the so-called "Jobs Act" (Law number 183 of the Year 2014), with strict rules about hiring and firing workers and because of the different types of employment contracts that limit both youth and female labour market participation. In particular for women is difficult to re-enter in the labour market after pregnancy. Moreover, women who want to have a child are more exposed to exit from the labour market (Matysiak, Vignoli, 2008), and those who give birth while employed often do not return to work until the child has grown (Matysiak, Vignoli, 2009).

Female labour force participation rate decreased between 1992 and 1997, passing from about 57% to about 49%, then started to increase again until 2016 (last data available) reaching 64.2%. By contrast, Italy experienced an increase starting from the 1970s, passing from 28% in 1970 to about 56% in 2016 (Graph 18).



Graph 18 Female Labour Force Participation. Source: OECD (2018), "Labour Market Statistics: Labour force statistics by sex and age: indicators", OECD Employment and Labour Market Statistics

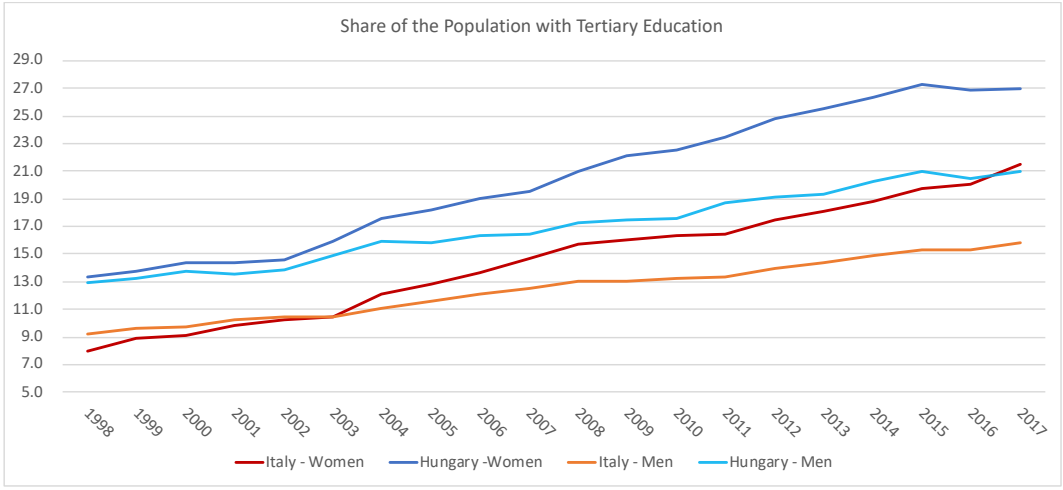
The problems associated with the incompatibility of motherhood and paid employment have recently been exacerbated by increases in the uncertainty and instability of employment contracts. Hungary and Italy are port of the group of countries with the highest percentage of temporary contracts (Matysiak, Vignoli, 2009). In Hungary, only a very small share of the employed have a part-time job (about 3 % in 2004). The incidence of this atypical form of employment has been substantially lower than in Italy, 12 % in the same year (Busetta, Giambalvo, 2014). In 2017, Hungary had an unemployment rate of 4.6%, whereas, in Italy the unemployment rate is 12.5% in 2016 (Graph 19). In Italy, a higher female unemployment rate is also found among young people, and the gender gap in the youth unemployment rate is heavily asymmetric, especially in the southern regions (Busetta, Giambalvo, 2014).



Graph 19 Female Unemployment Rate. Source: OECD (2018), "Labour Market Statistics: Labour force statistics by sex and age: indicators", OECD Employment and Labour Market Statistics

Moreover, in both countries, there has been an increment in female participation in education. In Hungary, the women graduation rate rapidly increased over the past decade (the rate was 13% in 1998 and 27 % in 2017).

In Italy, the share of university graduates has increased over the years and the percentage of female graduates exceeded that of male graduates in 2004 and in 2017 it reached 21%; while the share of men with tertiary education increased slowly from about 6% in 1998 to about 15.8% in 2017 (Graph 20).



Graph 20 Share of the Population with Tertiary Education. Source: OECD (2018), "Education at a glance: Educational attainment and labour-force status", OECD Education Statistics

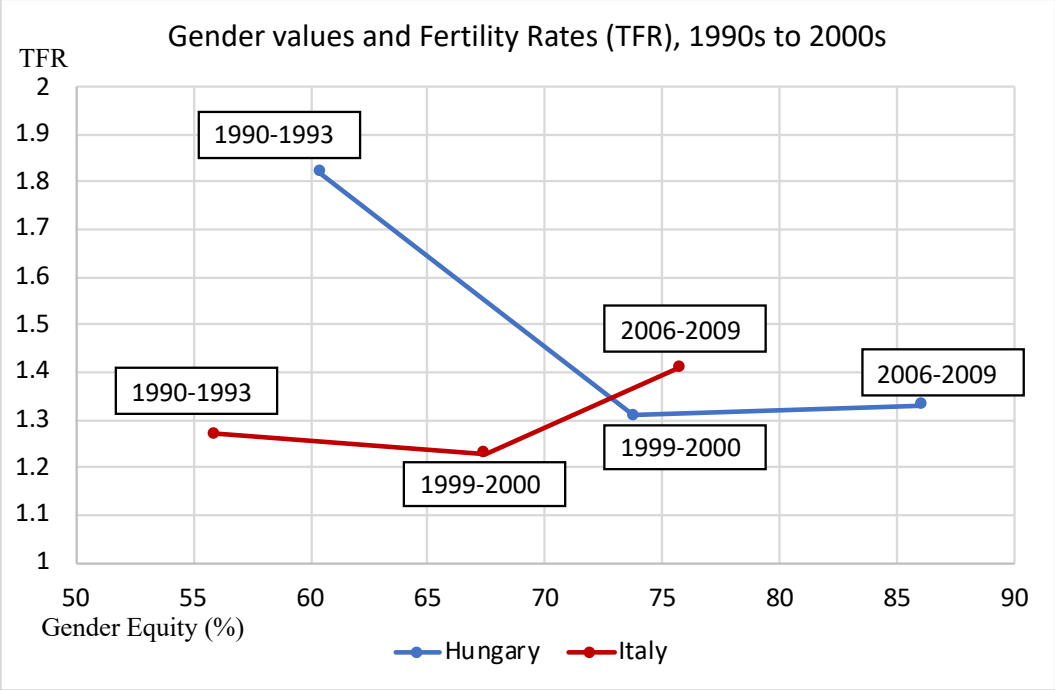
4.1.3 The progress towards Gender Egalitarianism

Several studies outline that the change towards a gender egalitarianism process is leading by cohorts. The cohort approach to societal transformation follows a long

tradition (Ryder, 1965) in stressing the importance of the socio-economic and ideational context at the time of a cohort's youth and various studies have demonstrated that each cohort have different gender egalitarianism norms (Firebaugh, 1992; Inglehart, Norris, 2003; Schnittker *et al.*, 2003; Brooks, Bolzendahl, 2004). New educational, work, and job opportunities for women and consequently new values, attitudes, and beliefs emerge among younger generations. The replacement of older cohorts by younger cohorts who are more interested in recent structural changes in education and work leads to a development of gender egalitarianism.

In particular, the link between gender egalitarianism and fertility is well theorised by Esping-Andersen in 2016 in the book titled "Families in the 21st Century". Even if most evidence provided cannot asses a causal relation, the connection between gender change and fertility exists and comparative findings have demonstrated it. Analysing data from European and World Values Studies, Arpino and colleagues (2015) traced how gender egalitarianism has influenced fertility behaviours. They use as measure to grasp gender egalitarianism the statement "when jobs are scarce, men should have more right to a job than women". Based on the level of disagreement, they present the association between total fertility rate and gender egalitarianism, showing that at the beginning of the 1990s, the U-shaped curve is presented, and highest fertility level can be found both in the most and in the least gender egalitarian nations. In the 1990s and at the end of the 1990s, more nations experienced a shift towards a more egalitarian society, and this also boosted fertility. This tendency is even more present in the new century: as countries adopt gender egalitarian norms, the total fertility rate is higher.

In the graph 21, we show only the trends for Hungary and Italy, using data from Arpino and colleagues (2015). Observing the third wave (2006-2009), total fertility rate seems higher in Italy than in Hungary; by contrast, gender egalitarianism norm is higher in Hungary than in Italy. How can we explain this difference between Italy and Hungary? Maybe, one of the possible explanations is that, for post-socialist countries, the statement "when jobs are scarce, men should have more right to a job than women" is not the best indicator to measure gender egalitarianism within couple, because the question that they used to grasp the adaptation of gender equity norm is based on a general question about work, lacking the familiar perspective.



Graph 21 Gender values and Fertility Rates, from the 1990s to 2002. Source: Arpino et al. 2015

As we outlined before, in post-socialist countries, women are seen as income providers since long time compared to Western countries, and women's integration in the labour market has been established. Consequently, the dual-earner couple model is the norm. So, to better understand if gender egalitarianism has advanced its status and if in the recent decades there is this shift towards a more gender equity society, we can observe other indicators, that better grasp the household framework. In particular, for post-socialist countries seem more useful to observe gender equity through other items.

In this line, Haller and Hoellinger (1994) observe a difference between attitudes towards gender role and attitudes towards double income. Attitudes concerning gender roles are measured using these items:

1. A working mother can have just as warm a relationship with her children as a mother who does not work;
2. A preschool child will suffer if his or her mother works;
3. Family life will suffer if the woman works full-time;
4. A husband's job is to earn money, a wife's job to look after home and family;
5. A job is all right, but most women really want a home and children;

6. Being a housewife is just as fulfilling as working for pay;

By contrast, attitudes towards double income are measured by using these items:

1. Having a job is the best way for a woman to be independent;
2. Husband and wife should contribute to the household income;
3. A woman and her family will all be happier if she goes out to work

Following table reports results just for Italy and Hungary:

Table 37 Multivariate Analysis of Cross-National Differences in attitudes toward Female employment. Source: Haller and Hoellinger (1994). Note: for a complete description about models see Haller and Hoellinger (1994)

	Attitudes toward Gender Role				*Attitudes towards Double Income*			
	(6-item Likert scale)				(5-point Agree - Disagree Scale)			
Model	1	2	3	4	1	2	3	4
Italy	-0.1	-0.2	-0.2	-0.1	0.37	0.37	0.39	0.39
Hungary	-2.4	-2.3	-2.3	-2.5	0.56	0.58	0.59	0.59

These findings suggest that Hungary is more in favour than Italy to female employment. By contrast, even if in Italy (compared to other European countries) gender egalitarianism is not the norm, it seems that Italians are less traditionally oriented than Hungarians. In other words, in Hungary, the rapid increase in female employment is not accompanied by a corresponding change in gender role attitudes. Haller and Hoellinger (1994) results show that there is no automatic connection between the transition to post-industrial society, the increase in female employment and the change in the conception of the role of women within the family.

Another research conducted by Pampel (2011) suggests building a scale, testing 12 items that cover several dimensions of gender equity (Cronbach's alpha of .80). Pampel refers to the work dimension, as Arpino and colleagues did; however, the focus seems to stress more the importance of the household and to frame the questions within the family context. In particular, the items are:

1. A working mother can establish just as warm and secure a relationship with her children as a mother who does not work;
2. A preschool child is likely to suffer if his or her mother works;
3. Family life suffers when the woman has a full-time job;

4. A job is all right, but what most women really want is a home and children;
5. Being a housewife is just as fulfilling as working for pay;
6. Having a job is the best way for a woman to be an independent person;
7. Both the husband and wife should contribute to the household income;
8. A husband's job is to earn money; a wife's job is to look after the home and family;
9. A woman should work after marrying and before there are children;
10. A woman should work when there is a child under school age;
11. A woman should work after the youngest child starts school;
12. A woman should work after the children leave home.

Using this scale, Pampel (2011) tests theories of structural position and value change, suggesting that the increase in education and in career opportunities among women led societies to adopt egalitarianism. The evidence is strong and robust for women in Western states but is less supportive for men and for Eastern European nations.

Based on the general theoretical background and on our description of the Hungarian and Italian contexts, we formulated a set of hypotheses about the interaction effect of women's labour market participation and education and of women's labour market participation and cohorts on the transition to the first, second and third child. Suggesting that even if female revolution has advanced its status more in Hungary than in Italy, Italian context is characterised by a more rapidly shift towards gender equity norm, probably due to younger cohorts that are leading the revolution:

H1) We expect that in Italy a postponement of the entry into motherhood, as well as the transition to second and third birth, is less pronounced among working and more educated women compared to working and less educated women. Conversely, we expect that in Hungary working and high education have a negative impact on the transition to motherhood.

H2) We expect that in Italy younger and employed women anticipate the transition to the first, second and third child compared to older cohorts. In particular, we assume that gender egalitarianism is becoming the

norm among younger and working women, since they are more likely to have partners with whom share domestic and childcare tasks. By contrast, the female revolution in Hungary is at very early state, and younger cohorts are not promoting the change.

4.2 Empirical Strategy

Our empirical analysis is based on the second wave of Gender and Generation Survey for Hungary and, on Famiglie e Soggetti Sociali for Italy, respectively conducted between 2008/2009 and in 2009. Starting from the results of the previous chapters, we would like to observe the difference between Hungary and Italy, overall in terms of education and employment. We use the second wave for Hungary because it gathers information on job's career.

As we underlined in the previous chapter, the second wave of GGS is affected to a falling in response rates and to attrition. However, Hungary has an overall response rate of about 79% (Appendix I provides details about how the attrition is distributed and which main demographic characteristics affected this attrition).

In this chapter, we have the same data limitations as in the previous one. In particular, these surveys do not provide information about income from work, and they lack information also about partner's employment histories. The analysis, based on the result obtained in Chapter 2 and in Chapter 3, are now conducted on interrelationships both between work and education and between work and cohort, observing their effects on fertility.

The following sections describe our sample and the method that we used for this analysis.

4.2.1 Sample

The total sample for Italy is 22.759. From this sample, we excluded 10.487 women born before 1940 and after 1979. Then we dropped 506 cases for which the second/third child was born before the first/second one. Then we excluded twins: 178 cases. After controlled the missing and misreported information from the

beginning to the end of eight jobs of our variable of interest, the employment, we eliminated 8 cases[11]. After these selections, our Italian sample totals 11.580 women. Concerning higher order births, to analyse the transition to the second birth, we deleted 2.246 cases of women who did not experience a first childbirth during our observational period. As a result, for the second birth analysis, the sample totals 9.154 cases. We apply the same for the transition to the third birth, deleting 5.306 cases of women who did not have the first and second child. The total sample for the transition to the third childbirth is 6.274 respondents.

Hungarian dataset totals 6.106 women, we excluded from the analysis women born before 1940 and born after 1979 (n=1546). Then we dropped cases with missing or misreported information on year of birth of children: for the first child we dropped 1345 observations; for the second child we deleted 658 cases and for the third one we excluded 131 cases. Then we excluded twins: 46 cases. Finally, we excluded 2 cases for whom the childbirth occurred before the 14th birthday. After controlled missing and misreported information from the beginning to the end of eight jobs of our variable of interest, the employment, we eliminated 270 cases[11]. After these selections, our Hungarian sample totals 2.355 women.

Concerning higher order births, to analyse the transition to the second birth, we eliminated 511 cases of women who did not have their first child during our observational period. As a result, for the second birth analysis, the sample totals 1.842 cases. We apply the same for the transition to the third birth, deleting 1.171 cases of women who did not have the first and second child. The total sample for the transition to the third childbirth is 1.182 respondents

4.2.2 Method

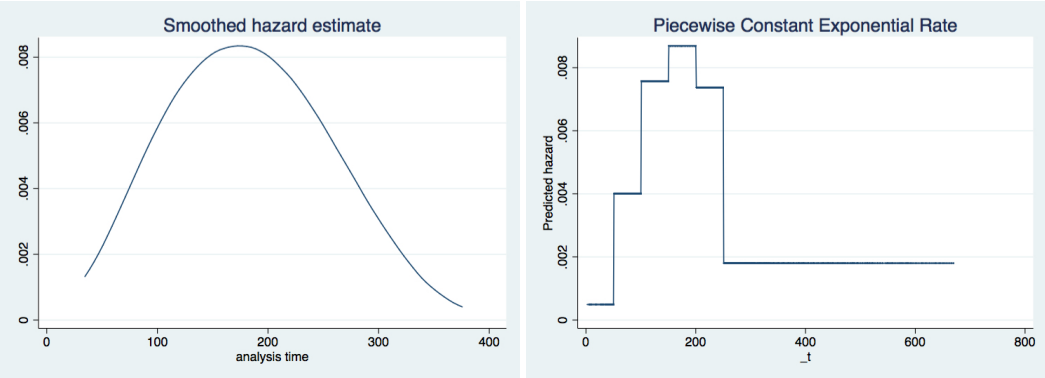
As we outlined in Chapter 2 and Chapter 3, we applied even in this case the piecewise constant exponential model. As in the previous chapter, all dates are expressed in terms of months since the start of the century (1900).

The transition to parities is observed in the same way as the Chapter 3 and we report here, for a more complete analysis, all graphs about the two countries that we have selected for this purpose.

[11] In the paragraph 3.2.2.1, we explain how we coded employment and why we deleted these observations

For the transition to the first parity, episodes begin at the 14th birthday and end with the birth of the first child (event occurred) or at the interview (event is right-censored). The baseline is the woman's current age.

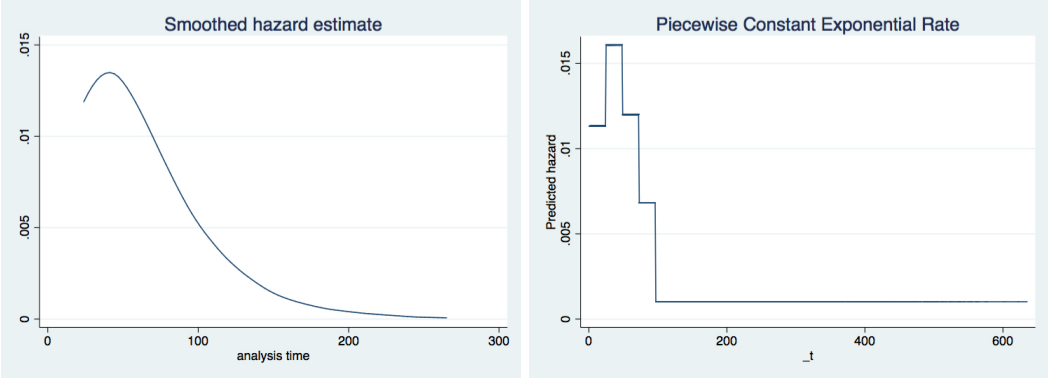
For the transition to the first birth, we divided the curve into 5 nodes (50, 100, 150, 200 and 250 that mean 18th, 22nd, 26th, 30th and 35th birthday starting from 14th birthday. The following graphs (Graph 22) show the hazard estimate and the piecewise constant exponential rate.



Graph 22 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the first birth in Hungary and Italy. Source: GGS 2nd wave and FSS 2009

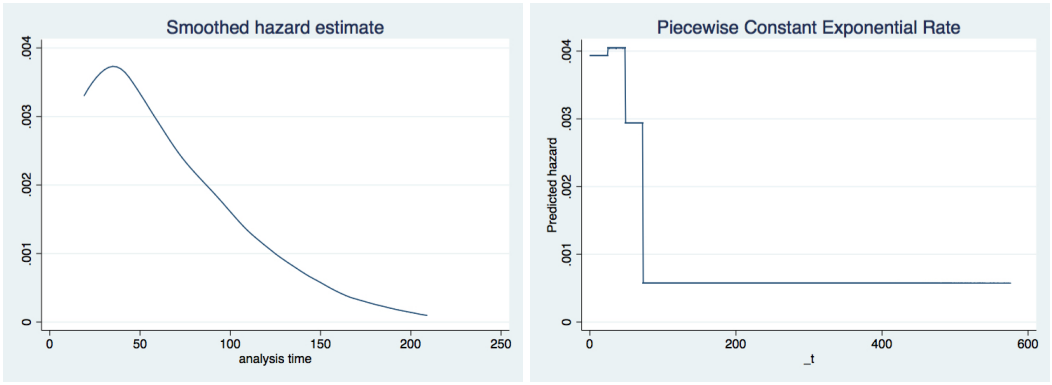
For the transition to the second and third parity, episodes begin at the birth of the first (second) child and end with the birth of the second (third) child or at the interview. In this case, the baseline is the duration since the birth of the first (second) child.

In particular, for the transition to the second birth, selecting 4 nodes, we have 5 intervals (24, 48, 72 and 96 months that are 2, 4, 6 and 8 years after the birth of the first child). Following graphs show both the hazard estimate and the piecewise constant exponential rate (Graph 23).



Graph 23 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the second birth in Hungary and Italy. Source: GGS 2nd wave and FSS 2009

For the transition to the third birth, we divided the curve into three nodes: 24, 48 and 72 months so 2, 4 and 6 years after the birth of the second child. Following graphs show the hazard estimate and the piecewise constant exponential rate (Graph 24).



Graph 24 Smoothed hazard estimates and piecewise constant exponential rate for the transition to the third birth In Hungary and Italy. Source: GGS 2ndwave and FSS 2009

2Based on the results on the previous chapter, for the purpose of our analysis, we decide here to present only results from the interaction effects.

To test the first hypothesis, we observed the interaction effect between education and employment, suggesting, as we expected, that in Italy the revolution has advanced its status among higher educated women. Whereas, in order to answer the second hypothesis about a cohort-effect, according to which younger lead the revolution and experience higher propensity to a(nother) child, we included an interaction effect between work and cohorts. In this case, for sample size reasons we recode the variable cohorts: collapsing the older one and the younger one into two categories 1940-1959 and 1960-1979.

4.3 Empirical Results

We first discuss the results for the interaction effect between employment and education, followed by a discussion about the findings for the interaction effect between work and cohorts. For each interaction, we refer to the transition to first, second and third childbirth.

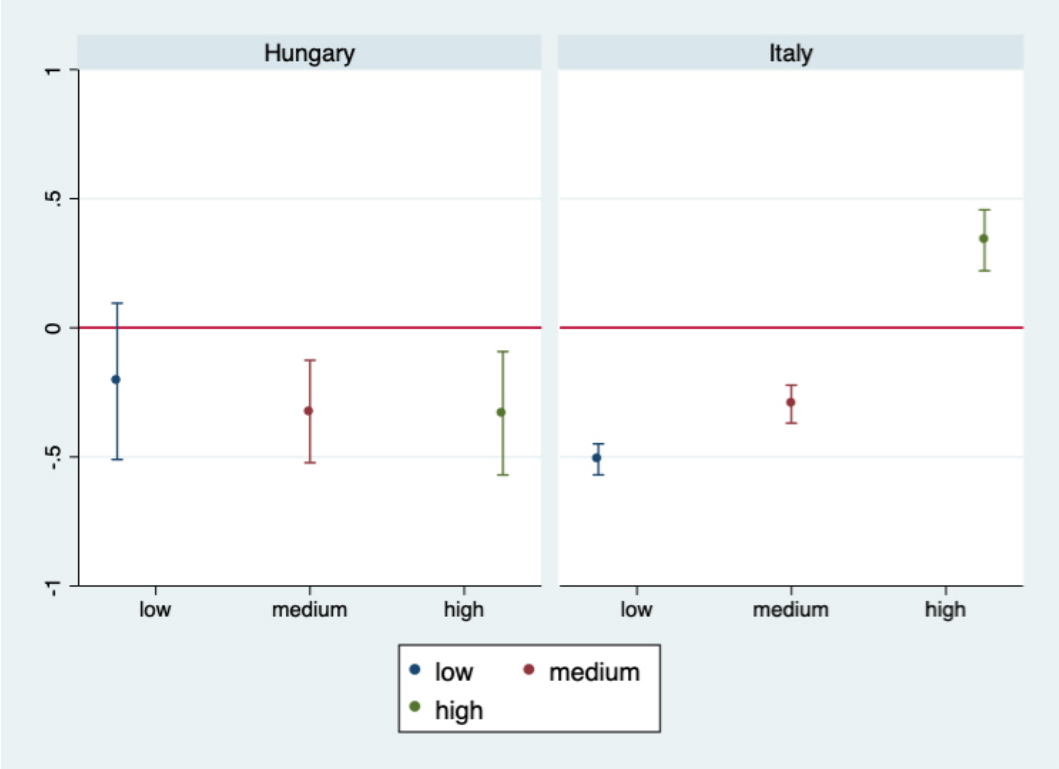
4.3.1 The interaction effect between employment and education

As discussed in previous sections, women with high education enter parenthood at a later age but tend to accelerate their progression to second and higher order births. However, employment is associated with a lower propensity to become mother in both selected countries. To shed light into the role of education and employment, we extended the full model, presented in chapter 4, introducing an interaction effect respectively between employment and education.

The following graphs show results for the transition to the first child as well as to higher order births.

Looking at the transition to first birth both for Hungary and Italy, findings suggest two different scenarios. In Italy, employed women compared to not employed ones experience a less propensity to enter into motherhood if they have obtained, as their highest degree, primary level of education. Secondary education softens the negative effect of being employed which passes from about -0.51 to about -0.3; but relative risk of entry into motherhood is still negative among employed women. Conversely, if we observe tertiary educated women, the effect of employment turns from negative to positive and reaches the relative risk of about 0.34.

By contrast, Hungary experiences the opposite trend. Firstly, the graph shows that there is no statistical difference between employed and not employed women when we look at primary education. Instead, medium and high education have similar negative effects among employed women. Secondly, the trend from low to high education suggests that the negative effect of employment on the transition to first birth increases, passing from about -0.21 (for low education) to about -0.33 (for high education) (Graph 25).



Graph 25 Log-hazard of having the first child, according to the interaction effect between employment and education. The reference category for employment is No. The model is controlled also for being enrolled in education and cohorts. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave

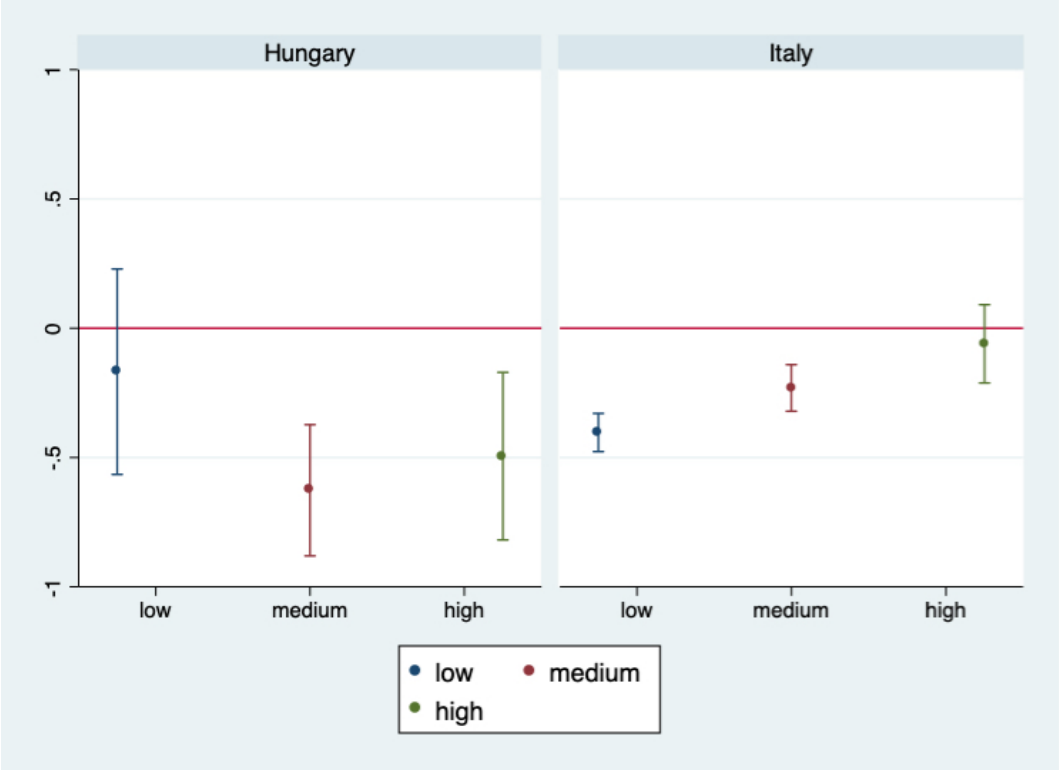
Following graph shows the results for the transition to the second birth. Even in this comparison, results reveal a strong difference between Hungary and Italy (Graph 26).

Italy shows a similar trend to the transition to motherhood: low education and medium education among employed women exert a negative effect on becoming mother for the second time; while, the coefficient for higher educated women is not statistically significant. If we observe the trend from low to high education, again findings suggest that higher educated women are leading the change; the coefficient is -0.4 for low education, -0.2 for medium level of education and turns into positive for high education (about -0.1).

In Hungary, by contrast, among employed women, it seems that low education does not exert any influence in the propensity to have the second child; while among employed women, both secondary and tertiary education are associated with a strong negative effect on transition to second parity.

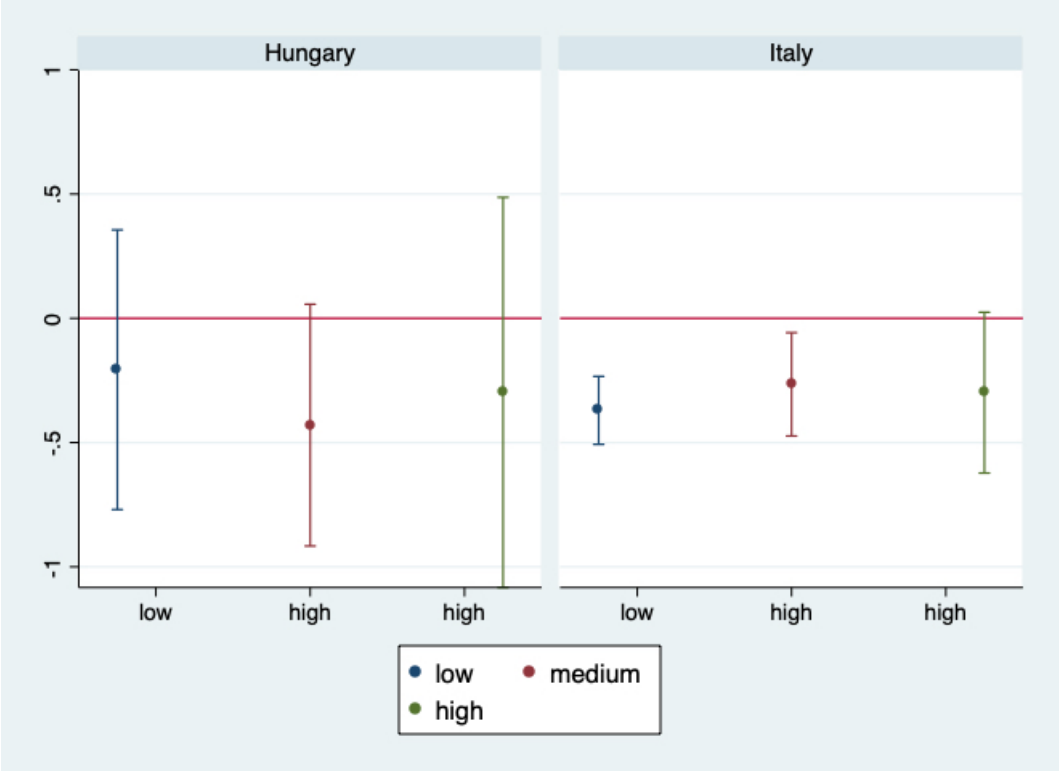
If we observe the effect of employment across the levels of education, we notice that the trend is not clear as in the previous model. However, we pass from -0.17 of

primary education to -0.6 of secondary education to, finally, -0.5 of tertiary education. It seems that Hungarian case shows a U-shaped curve, even if the difference between medium and high education is not strong; while the difference between low and the other two levels of education is extremely pronounced.



Graph 26 Log-hazard of having the second child, according to the interaction effect between employment and education. The reference category for employment is No. The model is controlled also for being enrolled in education, cohorts and age at first childbirth. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave

Graph 27 shows results for the transition to the third child. As we repeatedly outlined in the other chapters, some coefficients are not statistically significant because this sample is particularly small due to the fact that we are only observing women who already had the second child.



Graph 27 Log-hazard of having the third child, according to the interaction effect between employment and education. The reference category for employment is No. The model is controlled also for being enrolled in education, cohorts and age at second childbirth. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave

Nevertheless, we observe some important trends and results. Among Italian employed women, both low and medium education have a negative effect on the transition to third parity, the coefficients are respectively -0.38 and -0.27; while there is no statistical difference between employed and mot employed women, when we observe tertiary level of education. Findings on employment across education are not clear as in the previous transitions; however, among low educated women the effect of employment is more pronounced than among secondary and tertiary level of education, where the coefficients are similar.

The Hungarian sample is even smaller than the Italian one, so all coefficients are not statistically significant, and it seems that among all different level of education, being employed is not associated with a lower risk of having the third child.

However, we can observe again the U-shaped curve, for which secondary education depresses more the propensity to third parity than primary and tertiary education.

These results confirm our first hypothesis and suggest, as we underlined in the previous chapter, that for mothers is difficult to combine work and life; however, education seems to play an important role. This varying effects of educational levels

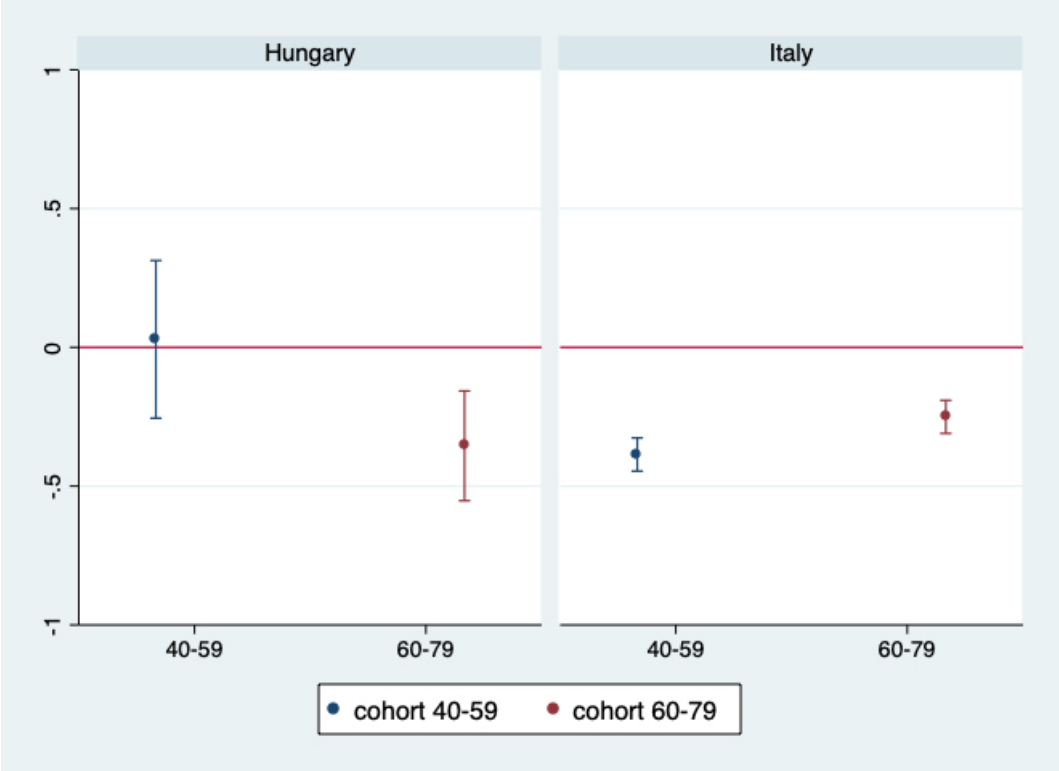
in the two countries may be related to employment opportunities for highly educated women than for less educated ones. For Italy, this result could be interpreted in light of the strong polarisation of women's positions: highly educated women being quite successful in the labour market and in combining work and household responsibilities, and less educated women having more trouble to balance family and life.

4.3.2 The interaction effect between employment and cohorts

As we observed in the previous sections, in order to understand if younger and employed women experience a higher level of fertility – and then if in this particular group the so-called gender revolution has advanced its status – we extended the last model showed in Chapter 3, introducing an interaction effect between cohorts and education both for first and higher birth orders. For sample size reasons in Hungarian data, in this case, we decided to modify the variable cohorts, reducing it into two modalities: younger cohorts and older cohorts, respectively women born from 1940 to 1959 and from 1960 to 1979.

Graph 28 shows results of the transition to the first child. In Italy we can observe that in general employment reduces the relative risk of having the second child, as we observed in the previous chapter. In fact, employed women born between 1940 and 1959 compared to not employed ones born in the same period experience a less propensity to have the first child as well as employed women born between 1960 and 1979. However, some dissimilarities emerge if we look at the difference and between older and younger cohorts. Among employed women, younger cohort experience higher propensity to have the first childbirth; coefficient is -0.39 for the older cohort and -0.25 for the younger one.

Hungary shows different results: employment exerts a negative effect on the propensity of having the first child only among women born between 1960 and 1979; while among women born in the older cohort the coefficient is not statistically significant, so the difference between being employed or being unemployed is not statistically relevant. Among younger women, being employed strongly decreases the propensity to entry into motherhood compared to not being employed.



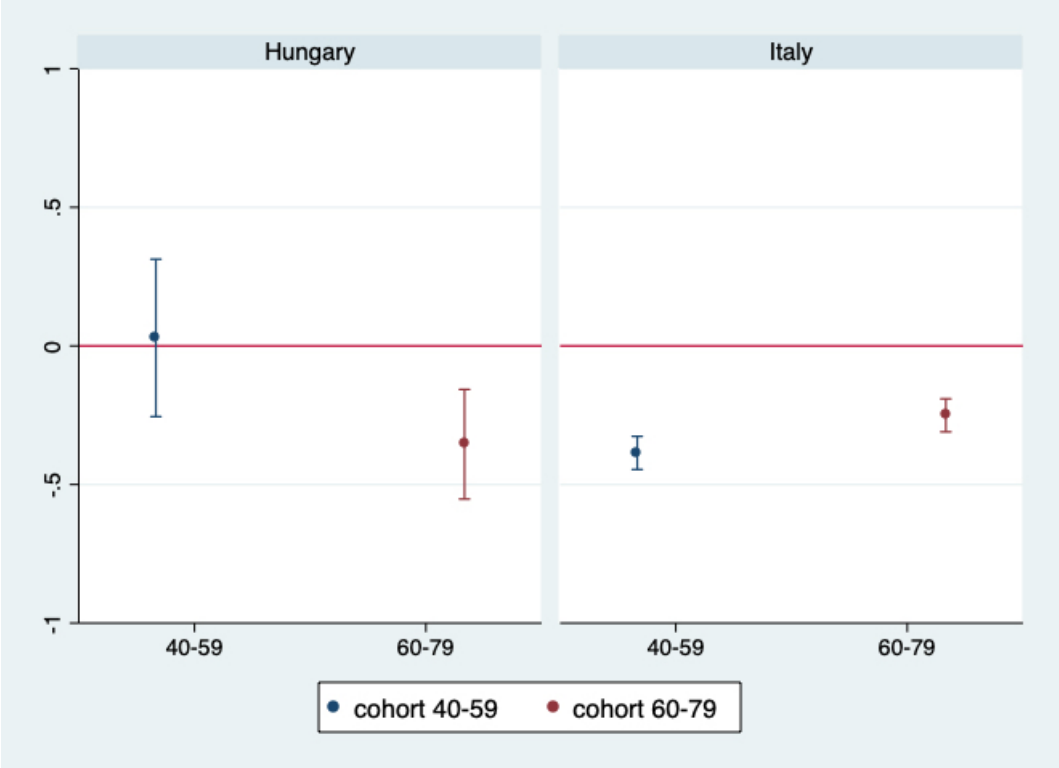
Graph 28 Log-hazard of having the first child, according to the interaction effect between employment and cohort. The reference category for employment is No. The model is controlled also for being enrolled in education, and level of education. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave

Following graphs display results for the transition to the second and third childbirth. These results show a similar trend to the one found for the transition to first child (Graph 29 and 30).

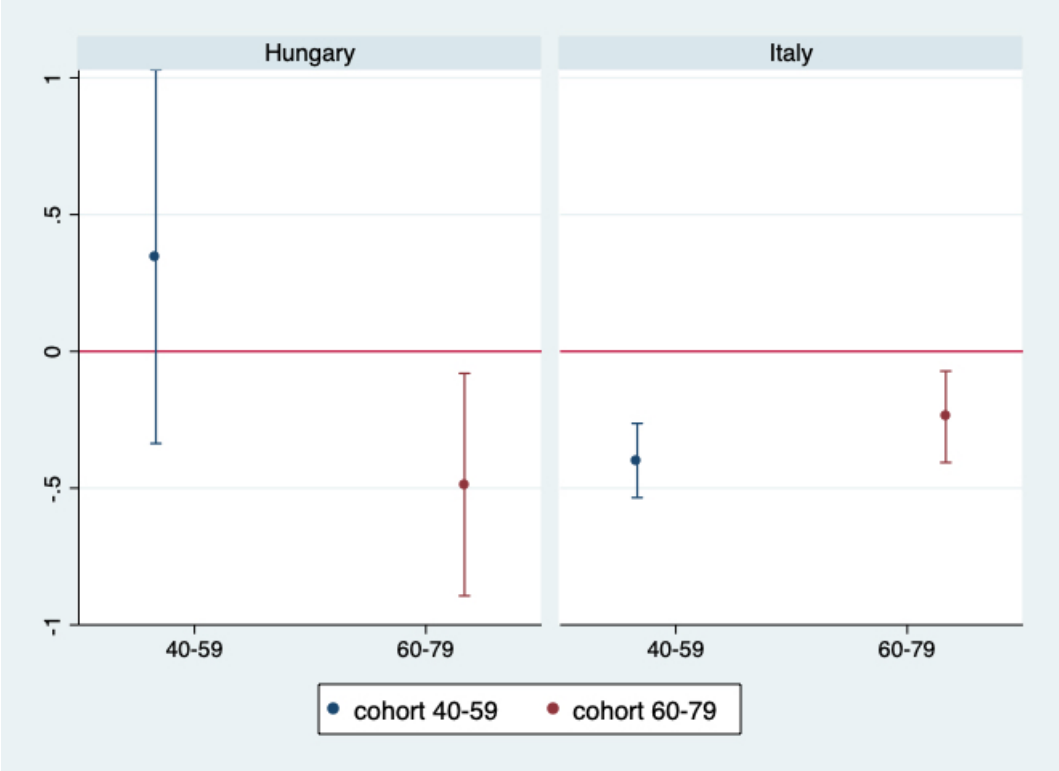
In Italy, to be employed is associated with lower propensity to have the second and the third child, for all cohorts selected. However, the relative risk, concerning the second parity, decreases passing from the older cohort to the younger one, respectively from -0.38 to -0.22; while for what concerns the third child, it decreases from -0.4 to -0.24. Hungarian results for the transition to second and third parity show again that among employed women, younger cohort is more disadvantaged compared to older one, in which there is not statistical difference between being employed and not being employed. While employed women born during 1960 and 1979 have a lower relative risk to have the second child, compared to not employed women.

These results confirm our second hypothesis, observing that even if being employed exert a negative effect on fertility, in Italy among younger cohorts this effect is softened compared to the older one. These findings suggest that probably new

educational, work and job opportunities for women and consequently new attitudes, values and beliefs emerge among younger generations. The replacement of older cohorts by younger ones, who are more affected by new structural changes in education and work is leading to a more gender egalitarian society. However, Hungary probably is still anchored at a very early stage of the revolution. Even if the female labour force participation is accepted and encouraged by Hungary, this is not leading automatically to a more gender equity society and probably attitudes towards gender equity are traditional and women reduced their fertility in order to fulfil their educational and careers aspirations.



Graph 29 Log-hazard of having the second child, according to the interaction effect between employment and cohort. The reference category for employment is No. The model is controlled also for being enrolled in education, level of education and age at first childbirth. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave



Graph 30 Log-hazard of having the third child, according to the interaction effect between employment and cohort. The reference category for employment is No. The model is also controlled for being enrolled in education, level of education and age at first childbirth. Confidence interval 95%. Source: Istat FSS 2009, GGS 2nd wave

4.4 Discussion

In this paper, we looked more closely into how country-specific factors shape the interrelationship between childbearing and women's labour supply by comparing Italy and Hungary. These are two low-fertility countries where the country-specific difficulties about work and family reconciliation are similarly strong, but which differ in the history of women's labour supply and the extent to which couple's material aspirations are satisfied by men's earnings. In particular, in this study concerning Italy and Hungary, we tried to determine the effect of women's labour market participation, observing both the impact of education and cohorts on fertility behaviours. The comparison of these two countries provided us thus with an opportunity for studying how the differences in women's economic roles that permeated the past affect contemporary women's employment and fertility behaviours. Based on results from the previous chapter, our findings confirm that women's employment clearly conflicts with childbearing in both countries. However, this study tried to go beyond, providing new insights into the

interrelationship between education and women's employment and cohorts effect and women's employment.

Focusing on data limitations, it should be outlined that findings can be the consequence of unavailable information on variables found to be important by other researchers in this context. We were unable to consider internal migration over the life course, or the male contribution to the reproductive decision. Although we assume that the life history of the male partner plays an important and often crucial role in a woman's choices regarding childbearing, it was not possible to study the interaction between the two biographies (Beckman, 1983; Kreyenfeld, 2002; Rosina, Testa, 2009). Unfortunately, retrospective life course information about previous partners was not included in the survey so that we cannot account for this information in our models. There is also a lack of other potentially relevant information such as the educational career pattern and area of education. Further analyses taking into account this additional information is required for a better understanding of the relationship between education and fertility. Moreover, this analysis does not consider the difference within countries and some research have outlined the importance of distinguishing, for example, North and South in Italy (Impicciatore, Dalla Zuanna, 2016).

Nevertheless, the contexts, economic, as well as social and political, differ between Italy and Hungary, and the results of our models help us to identify some characteristics of the postponement of childbearing in two European countries with recently diverging developments in lowest-low fertility. Our findings generally show that in both Italy and Hungary fertility postponement is influenced by the increasing involvement of women in paid work, as we observed in the previous chapter. On the one hand, women with higher levels of education tend to postpone childbearing until they are well-established on their career paths in both countries (as underlined in Chapter 2); on the other hand, this effect enhances for employed women: when women with higher educational levels are employed, they do not postpone motherhood in Italy, whereas in Hungary women with higher level of education tend to postpone the entry into motherhood. Similar results and trends can be found observing the transition to second child: Italian higher educated women are leading the change and they experience higher propensity to have the second parity in line with our first hypothesis.

If we observe the differences in cohort effect in Hungary and in Italy, one possible explanation can take into account the idea of Incomplete Revolution (Esping-Andersen, 2009). Among younger cohorts, the increased involvement of partners and of fathers in housework and childcare duties may result in a positive effect on the propensity to have a(nother) child; however, both in Italy and Hungary the gender equality model is far from being the norm and women's revolution is still incomplete. However, the "positive" trend found in Italy suggests that this country is moving towards a more gender-equal system where couples, who are similar in terms of human capital, follow a model of dual careers and shared home production. By contrast, in Hungary the negative effect can reflect the more conservative attitudes towards women's role.

In other words, while the Hungarian findings are in line with the New Home Economics literature, which has argued that the opportunity costs of having children are higher for highly educated women; the Italian results are more in line with gender equity approach (Goldscheider *et al.*, 2015; Esping-Andersen, 2009; 2016, Esping-Andersen, Billari, 2015). Findings seem to suggest that gender equity is more common among higher educated individuals (Duvander, Andersson, 2006; Brodmann *et al.,* 2007; Duvander *et al.,* 2010). In fact, we can suggest that the positive effect of employment on fertility among younger and educated cohorts in Italy is leading to a spread in gender egalitarianism. This revolution is at a more advantaged stage in Italy compared to Hungary.

Again, we would like to stress that different stages of the women's revolution can create a polarisation not only between countries, but also within countries, for which more educated women have higher opportunities than lower educated ones.

Conclusions

Why should we be concerned with fertility? Fertility levels have fallen well below replacement level in many industrialised countries, prompting some to claim that we are now experiencing a fertility crisis (Billari *et al.*, 2001). This decline in fertility has become an increasing concern, particularly in countries where fertility is staying for long periods below replacement level (Chenais, 1996). These unprecedented levels of low fertility have serious long-term consequences, including ageing populations, a reduction in the active working population and smaller overall populations (Teitelbaum, Winter, 1985).

Furthermore, another argument is that contemporary fertility falls far short of citizens' ideals and preferences regarding family size and formation. That is why, like many recent researches, we give particular attention to the impact of changing gender and family roles. In fact, two ongoing revolutions that unquestionably must influence childbearing, namely women's exit from housewifery and the adoption of new ways of being partnered and forming a family.

Then, the importance of using a comparative approach, stressing in particular the differences between Western and Eastern Europe countries with the aim to observe convergence or divergence across Europe.

In particular, the contribution of this thesis consisted of investigating the effect of education and employment on fertility. Indeed, we wanted to explore mechanisms in social reproductive behaviour by focusing on the main two domains of an individual's life: education and employment. Starting with very broad questions: how does education affect the transition to motherhood and higher order births? How does employment affect the transition to motherhood and higher order births?

In order to provide an answer to the research questions, in the first section of the thesis we gathered some theoretical tools that helped us to explain the different effects of these two dimensions both within and between countries. Firstly, we presented the theories avoiding the distinction between fields, presenting the theories as if they are on a continuum, identified by four "poles": micro/macro and material/ideal. On the background, theories on fertility were a constant reference point, especially the theory of New Home Economics, the Second Demographic Theory and the explanations proposed by Gender Equity theories, which provided

useful concepts to look at fertility behaviours in the context of changes in women's roles. The aim of Chapter 2 is to observe the relationship between education and fertility, focusing on the effect of educational attainment on the transition to the first, second and third childbirth. The results suggest that transition to second and third birth are more in line with Gender Revolution hypothesis in Western European countries, in which higher educated women have a higher relative risk to have the second and third child compared to lower educated women. The polarisations between more educated women and lower educated women and between West and East are leading to social inequalities across countries.

Chapter 3 aims to extend the literature about the effect of women's employment, on fertility behaviours, observing in particular the thesis found at the macro level, concerning the period after the mid-80s, when the association between employment and fertility changed from negative to positive. The result suggests a deep difference across countries, opposing, on the one hand, all post-socialist regimes (aside Hungary) and social democratic regimes and on the other hand, Italy and Hungary. In general, results regarding the transition to the first child suggest that post-socialist and social democratic regimes countries support more working women. Furthermore, findings on the transition to second birth reveal that for working mothers is more difficult to combine work and childcare duties compared to their counterparts and therefore the risk of postponement is higher.

Based on the previous results, the last chapter (Chapter 4) sheds light on the relationship between employment and fertility behaviours in Italy and Hungary. Previous empirical research on attitudes toward double income and gender equity theorises that while the former is more developed in Hungary than in Italy, the latter is more spread in Italy. This distinction permits to explain results for which in Italy employed women with tertiary education have a higher relative risk to become mother compared to their counterparts; while in Hungary tertiary educated women experience lower propensity. These findings can be interpreted in terms of the spread of attitudes towards gender equity that is more developed in Italy than Hungary.

Limits and possible further developments

Our research presents some limitations and can therefore be extended and improved by further studies. Firstly, the main limit of the study: the lack of the analysis on men. Including men and in particular couple level in the analysis could help us to observe in detail gender differences. Previous studies (Kreyenfeld, 2002) show that in West Germany partner's education is more strongly associated with the transition to second birth than women's education. Having a birth is a couple's decision (Beckman, 1983) and partners' education play a key role in the decision to become parents. Unfortunately, retrospective life course information about previous partners is not included in the survey so that we cannot account for this information in our models.

Secondly, as we repeatedly outlined during the thesis, we need to consider more countries in order to observe the convergence or the divergence between them. For example, surveys considered lack of data on Nordic countries as well as Southern Europe ones. Moreover, our research has studied the association between education and employment on family choices in Europe without considering the territorial differences. Some selected countries present a gap between different geographic areas that are not only economic, but also concern reproductive behaviour (for example, Italy, Hungary and Germany). It would therefore be interesting to deepen the analyses carried out in this work by separating countries in different geographical areas, so as to take into account the various economic and social developments in the countries. In the third place, GGS and FFS gather data before the recent economic crisis, happened around 2007/2008. However, recent studies outline that the crisis affected fertility patterns. In particular, it is demonstrated that fertility rates at younger ages seem to respond more to adverse economic conditions (Goldstein *et al*., 2013). As regards as European countries, Italy and Spain's recession is affecting more fertility trends, probably because they are characterized by unstable job entry patterns, and in these regions the recession has exacerbated the problems in particular for younger cohorts. In order to fully understand the repercussions of the economic crisis on Europe's fertility development, we need to observe family policies, considering that they may have softened the adverse effects of the crisis.

However, the effects of the recent recession are not universal and unidirectional, since institutional factors and policies intervene at every step in the link between economic downturn and fertility behaviour (Sobotka *et al*., 2011).

Finally, our research analysed the effects of reproductive behaviours focusing on two indicators: education and employment. We need to consider the role of measurement issues linked to the fact that we could not include education as a time-varying covariate because of a lack of information. Our results may suffer from anticipatory bias, since women may have acquired their highest level of education after the birth of the child. The use of more detailed data that include the full educational history could help to avoid anticipatory bias when applying event history analysis (Hoem, Kreyenfeld, 2006). Moreover, for what concerns employment, it would be important to have longitudinal or retrospective data that would allow us to study the economic dimension of women careers, such as income.

Furthermore, from a methodological point of view, it is important to underline that our work is focused on two main causal relationships: the former one, between education and the transition to the first, second and third child; the latter one, between employment and the transition to the first, second and third child. However, if it is true that education and employment choices can exert an effect on fertility behaviours, it is also true that fertility has an impact on education and employment, for example on the decisions to pursue the educational career or on the decision to re-entry in the labour market after the birth of the child. Therefore, if we assume that the relationship is mutual, there may be unobservable factors that can affect fertility and education (Lillard *et al.*, 1994; Martín García, Baizan 2006; Martín García, 2009). It would be useful to replicate our analysis with other statistical techniques that take into account both selectivity and potential endogeneity (Impicciatore, Dalla Zuanna, 2016). Selectivity considers the different timing of the first birth according to the other variables, which may affect the second and higher birth order; while, potential endogeneity considers common unobserved factors that influence both education/employment and fertility choices. Selectivity can be also consequence of cultural components such as religiosity, family socialization and personal attitudes that are relevant in reproductive choices and are difficult to measure. Another possible development in chapter 3 and 4 can include multiprocess models considering the variable “ever worked” as a function of a set of covariates and model this equation together with the three equations

related to the first, second and third child birth. In this way, we can account for the potential endogeneity of the working career and correct the effect of work on reproductive behaviour from potential unobserved factors able to influence both behaviours. This strategy is rarely adopted, and the results show that the endogeneity in the relationship with education and fertility does not emerge as a relevant characteristic (Impicciatore, Dalla Zuanna, 2016). In fact, they observe in Italy that simultaneous equations in order to account for unobserved variables that may simultaneously affect both fertility tempo and fertility quantum, modify the magnitude but not the sign of coefficients obtained using independent equation, because other factors arise as more relevant than the control for selection through joint modelling (Appendix V provides tables with both independent and simultaneous models).

Finally, in all the models of this thesis, like in the majority of demographic studies that focus on micro-level behaviours, the outcome of interest is the hazard rate (or transition rate). The hazard rate, however, combines information regarding both the timing and quantum of events, leading to difficulties in interpretation. This is much less of a problem when everybody (or the majority of individuals) in the sample experiences the event, since the quantum eventually ends up to one, whereas this is more problematic in those cases when the differential in quantum is much higher (e.g., the experience of a third birth). The inclusion of unobserved heterogeneity may, to some extent, account for the fact that some individuals (for unobserved reasons) have less inclination to experience an event than others; however, it is not helpful enough to disentangle whether the inclination refers to the timing or to the quantum.

Policy relevance and concluding remarks

Societal changes that have occurred in the last few decades have emphasised the importance of gender-egalitarianism at both the individual and societal levels for the future of the family (Esping-Andersen, 2009, 2016; Esping-Andersen, Billari 2015; Goldscheider *et al.,* 2015). The increasing participation of women in higher education and labour force participation have had notable consequences on fertility. In particular, the cross-countries analysis allowed us to study in deep how inequalities within and between emerge. Overall, the way education and gender

(equality) interacts in differentiating the fertility levels of couples will have consequences for the reproduction of inequalities in society. The heterogeneity of European countries in this regard may serve as a "laboratory" to explore the role of contextual factors and possible policy outcomes. While theories about gender-egalitarianism and fertility tend to be optimistic regarding positive outcomes for fertility, empirical evidence shows that some European countries are far from reaching a convergent behaviour in the relationship between education/employment and fertility (Goldscheider *et al.*, 2015; Cherlin, 2016). As we observed, similar fertility levels across countries may be the result of different contexts. For example, in Western European countries, higher educated women postpone first childbirth or remain childless. However, among mothers, we found a positive educational gradient on the propensity to have an additional child. At the extremes, such polarisation between Eastern and Western countries behaviour in the relationship between education and fertility may lead to a widening of social inequalities, driven by the fact that in more traditional countries in terms of gender equity attitudes, couples who tend to have more children are those with lower human capital, whereas in more gender egalitarian countries, couples who tend to have more children are those with more human capital. Moreover, as we repeatedly suggested only in Western countries, younger cohorts seem to be the forerunners of this "quiet revolution".

There are many mechanisms involved in the social reproduction of gender inequality (Brighouse, Wright, 2008). All these mechanisms are undoubtedly intertwined. The first one can be traced to gender inequalities in labour market and employment opportunities; the second one concerns mostly the couple level: in fact, given the inequalities in the labour market, men's careers have a stronger potential income on household standards of living than women ones. Consequently, both husbands and wives feel the pressures on expectations about their "roles" leading wives to devote more energy to domestic responsibilities, including child care, and reinforcing the normative understanding of male's careers as more important even in those households where the careers of wives are economically more important than those of their husbands. The third mechanism regards childcare/caregiving policies: the lack of inexpensive childcare, good parental leave programmes and work flexibility creates more obstacles to overcome inequalities. The last mechanism regards social norms, in particular gender norms that reinforce

stereotypes about female and male behaviours. These norms, internalised by both men and women, influence their preferences and consequently their behaviours.

So, in light of these differences between and within countries, the following question arises: what can be done, therefore, to reduce inequalities?

Our study has very much stressed the growing centrality of gender equalisation for fertility decisions. As is now well-understood, there are two parts of gender equalisation: relations within the family and egalitarianism embedded in societal institutions. It is only when both family and institutions have adequately adapted to women's new roles that we should expect strong fertility effects.

Then, we can identify various fields in which measures are developed in supporting fertility intentions: economic benefits, services and measures that try conciliating work and family. Theories coming from different fields, such as economics, sociology, demography, have focused their attention on measures that support the decision to have a child: in particular, the sustainability of the costs of childbearing, the workload of care, the incompatibility between work and childcare. The economic measures usually include different interventions. The first one is called direct cash payments, such as baby bonus payments and family allowances (Aassve *et al.*, 2006). However, direct effects can exert an impact more on quantum than timing. The second measure regards indirect transfers on childbearing, including policies such as tax exemptions, housing policies, health care and child tax credits. However, some researches have demonstrated that the effects are modest (Whittington, 1992; Zhang *et al.*, 1994; Kearny, 2004; Gauthier, 2007). Other measures that tend more on improving work and family compatibility can have the effect also on timing of childbearing. For example, the existence of childcare facilities for children under the age of three is an important factor that supports women to re-entry in the labour market, helping them to combine parenthood and employment. Childbearing is also positively influenced both by the reduction of childcare cost and by the increase in childcare availability (Del Boca, 2002). Availability more than affordability and the access to informal childcare boosts the transition to motherhood (Hank, Kreyenfeld, 2003; Rindfuss *et al.*, 2007; Zabel, 2009).

It is important to underline that work-life balance policies can reduce inequalities both between men and female, but also between women. Lower educated women can have the necessity to work even in the presence of one or more small children.

If, in fact, graduated women can more easily create a large family without leaving their careers, if they wish; less educated women can have more difficulty to balance the double role of mother and worker. Therefore, measures such as the extension of public services for children could operate as new protection factors for those who want, or need, to work and at the same time have a family.

Parental leave policy needs to be reconsidered as well, and there are two critical issues related to their design. Firstly, there are strong arguments in favour of redefining them as parental leaves, with built-in incentives for fathers that also want to interrupt employment. Indeed, research from Sweden shows that leaves for fathers exert a very positive effect on second births. The second issue has to do with defining the optimal duration. It is abundantly clear that too long (paid) leaves have adverse effects in terms of women's life-long work attachment. Too short leaves may, paradoxically, produce a similar effect since mothers may find themselves forced to abandon their jobs to take care of the child and there exists no clear consensus as to what constitutes the ideal duration of leaves.

These interventions seem necessary to reduce inequality, but as we have observed during all this work, a cultural change must also take place. Greater openness to gender equality can reduce the differences both between men and women and between women and, perhaps, increase fertility. One way to stimulate this change could be to encourage education, both for males and for females. In fact, more educated women increase their possibility to have better jobs and these jobs can protect them from inequalities; while, at the same time, more educated men support gender equity within couple and they are more involved in the division of childcare and housework duties.

However, it is important to outline that a central debate within the social policy literature surrounds methodological difficulties in directly measuring policy impacts on childbearing postponement (Mills *et al.*, 2011). First, the range of policy measures that can influence childbearing makes it difficult to separate the effects of any specific measure. The second problem is that it is challenging to establish whether a specific policy instrument has been successful due to the temporal lag between the introduction and take-up of a policy. A third difficulty is the problem of the endogeneity of policies. Policies may not only influence fertility and induce change but are often a reaction to changes in fertility. In other words, an increase in

fertility levels may not only be a unidirectional outcome of policies, but the causal relation could also work in the opposite direction.

Furthermore, we acknowledge that our arguments about policy implications lose strength due to the fact that the focus of this thesis is on micro-level behaviour. An explicit examination of contextual factors that may be associated with the intersection between gender, education, and fertility (welfare state, family and fertility policies, gender measures) is, in fact, lacking. We are aware of the fact that these relationships strongly vary across countries and the challenge to reconcile micro-macro levels of analysis, hoping for improvements in data availability, remains an important task for the future.

Additionally, addressing the argument of proposals regarding family policies raises inevitably two sets of concerns: the first refers to the possibility to define a possible level of "optimal population" to be achieved, the second concerns the legitimacy of State intervention in decisions strictly connected to the private sphere of individuals and families. From the brief reconstruction of the consequences of low fertility on contemporary social systems (Chapter 1), it emerges that any policy aimed at supporting the birth rate can have only the aim to encourage individuals that have the wish to have children and, for various reasons, renounce them, to realise their fertility intentions, helping them with a "family- friendly" context. In the same trace, there is also the legitimacy of the State intervention: it is not necessarily a matter of designing pro-natalist policies, which often raise perplexity for potential interference in private life, but to ensure conditions of fairness and equal opportunities. Indeed, it is a fact that in Europe citizens' child preferences converge around the two child-norm and this ideal has been extraordinarily stable since the post-war decades and varies very little from nation to nation. Moreover, the proportion of women who prefer to remain childless is marginal everywhere. And, yet, we see a dramatic gap between preferred and realised fertility. In that line, welfare state should act, incentivising family-friendly policies that help women who want to have more than one child to more easily balance family and work, and to fulfil both their family and work obligations.

To conclude, the question, then, is whether we need stronger measures of furthering gender equality; in particular, measures that are designed to increase the involvement of men in caregiving activities.

Perhaps we are just too impatient, and the effect on women's labour force participation will gradually corrode inequalities norms and stereotypes. However, there is also the possibility that these beliefs and norms are sufficiently robust and sufficiently deeply embedded that the only way to reduce them is to undermine directly them. Esping-Andersen (2016) suggests that as the revolution spreads throughout society, such polarising effects should weaken, and inequalities could decrease. However, we have to wait to perceive the effects of this gender revolution across countries that maybe will become no longer "quiet", irreversibly "completed" and, finally, can create fairer and more egalitarian societies.

Appendix

Appendix I: Information on the first wave of GGS

The Generations and Gender Survey (GGS) is it useful to study a broad range of topics of relevance to population scientists. In fact, it covers a range of demographically relevant topics such as leaving home, union formation, fertility decision-making, combining employment and parenthood, intergenerational solidarity, and retirement.

Response rate

Most of the countries achieve response rates higher than 50%, with four countries (Bulgaria, Estonia, Georgia, and Romania) even surpassing the 70% threshold (Fokkema *et al.*, 2016). However, a number of countries had relatively poor response rates (Belgium, Lithuania, the Netherlands, and the Russian Federation). The main reasons for these low response rates are inability to contact the sample units and their refusal to cooperate. One exception to this observation is the Netherlands, where the very high refusal rate clearly suggests a hostile survey climate probably due to the fact that the Dutch GGP was built as a multi-person survey, and some respondents did not collaborate, because they did not want to involve other family members. (Fokkema *et al.*, 2016).

The following table shows response rate, calculated by Fokkema and colleagues (2016).

Response rate of wave 1 of the Generations and Gender Survey, by participating country (selected) (in %). Source: Fokkema et al., 2016

Country	Response rate
Belgium	41.8
Bulgaria	78.1
The Czech Rep.	49.1
Estonia	70.2
France	66.8
Georgia	78.2
Germany	55.4
Lithuania	35.6
The Netherlands	44.6
Romania	60.2

Russian Federation	49.7
Sweden	54.7

Information not included in the dataset

Concerning the main independent variable of the Chapter 2, educational attainment, GGS dataset does not provide the entire educational trajectory; however, it is still possible to obtain information regarding the highest level of education by combining the questions: "What is the highest level of education you have successfully completed?" and "In what month and year did you reach that level?".
Concerning the main independent variable of the Chapter 3, work, first wave does not contain information on the starting and ending time of each job. We have used the second wave; however, also the second wave does not have data on income from work. Hence, even though such data would be very useful for investigating the income effect of women's wages on fertility, we limit the investigation on the interrelationship between women's employment and childbearing
As regards partners, GGS gathers data on partnership histories; however, we know more information on the current partner (for example, current activity of current partner). Furthermore, retrospective life course information about previous partners are not included in the FSS survey so that we cannot account for this information in our models. According to Gottard and colleagues (2015), the unavailable information on partner's education can be viewed as an important unobserved characteristic that can be best captured by an individual time-dependent random effect. Other previous analysis (Kreyenfeld, 2002) show that in West Germany partner's education is more associated with the transition to second childbirth than women's education.

Appendix II: The attrition in the second wave of GGS

The second wave of GGS is affected by a falling in response rates and to attrition. Gender and Generation survey provides information about attrition considering sex and age.

In general, women are more likely to participate in the second survey than men in all countries. Furthermore, there is an inverted U-shaped relationship between age and response rate: the latter first increase, then decrease with age. The age category where the panel continuation rate is the highest varies across countries. However, the low response rate among elderly should consider that panel attrition includes the event of death. Bartus and Spéder (2013), analysing the attrition on 5 countries (Bulgaria, France, Georgia, Germany and Hungary) of the second wave of GGS, observe 8 variables: sex, age, marital status, level of education, income, ownership status, children in the household, labour force participation.

They find that response rates among owners is higher than among tenants and freely accommodated. Single-person households are underrepresented compared to both married individuals, and with the exception of Georgia, parents of young children are overrepresented compared to individuals having no child aged 0-6. Finally, married individuals and people who have a co-resident partner are more likely to be observed in the subsequent time period than people who are either single/divorced/widowed or who have a non-resident partner.

The overall continuation rate is the proportion of individuals in wave 1 who have been interviewed in wave 2: Source: GGS website (http://ggpsurvey.ined.fr/documents/Panel%20Continuation%20Rates.pdf)

Country	Bulgaria	France	Georgia	Germany	Hungary	Lithuania	The Czech Republic
Overall	72.67	64.83	82.95	32.21	78.59	22.86	31.49
Sex							
Male	72.18	63.58	80.18	31.26	75.29	20.14	30.73
Female	73.08	65.78	85.13	33.01	81.23	25.55	32.19
Age							
17-25	67.07	55.92	80.42	17.68	75.46	15.93	24.02
26-35	70.35	67.71	81.33	26.62	78.21	21.41	31.6
36-45	74.64	68.97	85.49	35.86	80.77	24.39	30.79

46-55	74.55	67.04	86.49	38.45	80.43	27.48	36.21
56-65	77.59	67.11	85.8	36.95	82.02	26.95	38.03
66-85	73.37	58.39	77.82	30.91	72.97	20.88	28.2

In general, it is widely held view that education is positively associated with panel continuation. In France, Germany, Georgia and Hungary higher educated peoples record higher level of response rate. By contrast, in Bulgaria educated people are less likely to participate in the second wave. The relationship between labour-force status and panel continuation is mixed. The only clear pattern is that students are less likely to participate in the second wave, probably because it is more difficult to contact them. With the exception of Bulgaria, employers/employees and people either staying or working home are the people with the highest chances of panel continuation. As might be expected, unemployed people are generally less likely to participate in the second wave. In France, Germany and Hungary, panel continuation is more likely among those who find it easier to satisfy their needs. In Bulgaria and Georgia, the opposite pattern emerges: people who find it very difficult to satisfy material needs are more likely to participate in the second wave. Summarising, Bartus and Spéder (2013) results are in line with previous research findings about attrition in other surveys. However, Bulgaria is found several times to be an "outlier". In fact, in Bulgaria, parents of young children do not participate with a higher probability than respondents having no young children.

In recent years, survey researchers were concerned with falling response rates. Bartus and Spéder (2013) suggest that this attrition can be explained observing the negative association between economic development and the response rates. Two possible explanations are provided: the first one concerns the fact that in developed countries market research institutes are more insistent trying to involve people in surveys; the second one regards the fact that individuals from more developed countries are more informed about the non-mandatory participation in the surveys. The fundamental methodological issue concerning the falling in response rate is the distinction between random attrition or selective attrition. If attrition is independent of respondents' characteristics, the consistency of estimates is not affected, it only reduces efficiency. However, if attrition does not randomly occur, estimators that take sample selection into account must be used (Heckman, 1979). Usually, it is "selective" because the probability of re-interviewing varies with the socio-

demographic characteristics of the respondents and the conditions in which the previous questionnaires were administered. Apart from the obvious problem of a reduction in the sample size, which can compromise the robustness of the statistical tests; as we suggested before, attrition can also distort the initial sample structure and bias the results and their interpretation (Razafindratsima, Kishimba 2004).
We decided to analyse also Germany, the Czech Republic and Lithuania, even if the attrition rate is especially high; however, caution in interpretation is needed for these countries.

Appendix III: Education and Fertility – hazard models

Transition to the first child 1st wave – models for each country

Transition to the first child – Bulgaria, Russia and Georgia

	Bulgaria		Russia		Georgia	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-6.397***	-5.754***	-6.749***	-6.123***	-6.629***	-5.929***
	(-102.23)	(-82.24)	(-92.54)	(-74.91)	(-90.06)	(-68.14)
19-22	-4.419***	-4.187***	-4.522***	-4.263***	-4.672***	-4.383***
	(-100.76)	(-93.27)	(-99.71)	(-90.98)	(-96.75)	(-86.74)
23-26	-4.150***	-4.094***	-4.136***	-4.092***	-4.518***	-4.457***
	(-85.90)	(-84.25)	(-85.20)	(-83.77)	(-86.51)	(-84.97)
27-30	-4.554***	-4.623***	-4.509***	-4.548***	-4.639***	-4.672***
	(-71.04)	(-71.11)	(-70.25)	(-70.41)	(-73.95)	(-73.93)
30-35	-4.868***	-4.955***	-4.868***	-4.933***	-5.114***	-5.169***
	(-52.59)	(-53.16)	(-53.44)	(-53.95)	(-57.48)	(-57.84)
35 +	-6.289***	-6.395***	-6.380***	-6.461***	-6.356***	-6.411***
	(-45.25)	(-45.91)	(-52.33)	(-52.92)	(-58.44)	(-58.85)
Education (Ref Medium)	0.506***	0.344***	0.173**	0.0766	0.267***	0.106
Primary	-12.92	-8.57	-2.81	-1.24	-4.24	-1.66
Tertiary	-0.561***	-0.133**	-0.329***	-0.0789*	-0.471***	-0.196***
	(-15.17)	(-3.12)	(-9.81)	(-2.17)	(-11.72)	(-4.44)
Cohorts (Ref. 1940-1949)						
1950-1959	0.137**	0.127*	0.167***	0.127**	0.202***	0.195***
	-2.62	-2.42	-3.61	-2.75	-3.85	-3.71
1960-1969	0.151***	0.131**	0.284***	0.223***	0.186***	0.175***
	-3.32	-2.88	-5.86	-4.58	-3.55	-3.34
1970-1979	-0.084	-0.129**	0.265***	0.187***	0.247***	0.214***
	(-1.78)	(-2.73)	-5.2	-3.65	-4.47	-3.88
Currently studying (Ref.No)		-0.945***		-0.745***		-0.781***
		(-19.25)		(-16.61)		(-14.80)
Observations	17588	17588	15667	15667	14637	14637

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – Germany, France and Hungary

	Germany		France		Hungary	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-7.433***	-6.640***	-7.139***	-6.536***	-6.672***	-5.877***
	(-71.01)	(-58.04)	(-75.87)	(-64.97)	(-107.76)	(-77.79)
19-22	-5.249***	-4.992***	-5.156***	-4.925***	-4.710***	-4.592***
	(-97.42)	(-91.59)	(-97.63)	(-91.52)	(-124.45)	(-120.60)
23-26	-4.815***	-4.770***	-4.433***	-4.378***	-4.214***	-4.168***
	(-89.26)	(-88.88)	(-86.72)	(-85.48)	(-106.39)	(-105.70)
27-30	-4.607***	-4.660***	-4.325***	-4.332***	-4.468***	-4.599***
	(-80.36)	(-80.61)	(-75.44)	(-75.07)	(-85.35)	(-85.42)
30-35	-4.743***	-4.825***	-4.805***	-4.821***	-5.271***	-5.377***
	(-69.86)	(-70.31)	(-62.31)	(-62.34)	(-57.57)	(-58.36)
35 +	-6.444***	-6.508***	-6.511***	-6.522***	-7.110***	-7.182***
	(-70.97)	(-71.37)	(-61.84)	(-61.94)	(-52.76)	(-53.22)
Education (Ref Medium)						
Primary	0.170**	0.0799	0.334***	0.213***	0.382***	0.298***
	-2.97	-1.39	-7.65	-4.82	-10.45	-8.04
Tertiary	-0.283***	0.0255	-0.418***	-0.173***	-0.484***	0.115*
	(-6.43)	-0.54	(-9.33)	(-3.68)	(-11.67)	-2.21
Cohorts (Ref. 1940-1949)						
1950-1959	0.0649	0.0779	0.0000476	0.0208	0.192***	0.200***
	-1.18	-1.42	0	-0.42	-4.79	-4.99
1960-1969	0.0706	0.115*	-0.106*	-0.0792	0.232***	0.250***
	-1.33	-2.17	(-2.06)	(-1.54)	-5.35	-5.79
1970-1979	-0.0374	0.0172	-0.276***	-0.275***	-0.457***	-0.447***
	(-0.61)	-0.28	(-4.75)	(-4.72)	(-9.95)	(-9.73)
Currently studying (Ref.No)		-1.050***		-0.987***		-1.055***
		(-15.97)		(-15.02)		(-17.27)
Observations	16712	16712	16568	16568	20693	20693

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – The Netherlands, Romania and Estonia

	The Netherlands		Romania		Estonia	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-7.941***	-7.216***	-6.939***	-6.282***	-7.265***	-6.595***
	(-53.18)	(-44.96)	(-93.92)	(-78.50)	(-71.79)	(-60.18)
19-22	-5.776***	-5.630***	-4.933***	-4.697***	-4.655***	-4.350***
	(-83.72)	(-80.94)	(-103.50)	(-96.28)	(-95.99)	(-85.55)
23-26	-4.782***	-4.686***	-4.492***	-4.396***	-4.131***	-4.063***
	(-80.12)	(-78.64)	(-92.21)	(-90.11)	(-81.99)	(-80.30)
27-30	-4.286***	-4.381***	-4.787***	-4.748***	-4.363***	-4.392***
	(-69.80)	(-69.90)	(-77.47)	(-76.48)	(-65.97)	(-65.85)
30-35	-4.274***	-4.378***	-5.350***	-5.310***	-4.842***	-4.889***
	(-61.86)	(-62.20)	(-58.79)	(-58.28)	(-48.88)	(-49.18)
35 +	-6.178***	-6.272***	-7.297***	-7.233***	-6.578***	-6.632***
	(-63.12)	(-63.65)	(-53.08)	(-52.64)	(-44.24)	(-44.59)
Education (Ref Medium)						
Primary	0.427***	0.394***	0.413***	0.243***	0.213***	0.088
	-9.01	-8.29	-11.13	-6.35	-3.62	-1.48
Tertiary	-0.504***	-0.216***	-0.616***	-0.198**	-0.414***	-0.114**
	(-9.99)	(-3.91)	(-9.83)	(-3.00)	(-10.31)	(-2.58)
Cohorts (Ref. 1940-1949)						
1950-1959	-0.265***	-0.254***	0.203***	0.203***	0.182***	0.143**
	(-4.84)	(-4.63)	-4.38	-4.38	-3.51	-2.75
1960-1969	-0.346***	-0.336***	0.340***	0.339***	0.282***	0.225***
	(-6.51)	(-6.33)	-6.84	-6.81	-5.28	-4.21
1970-1979	-0.749***	-0.734***	0.119*	0.108*	-0.131*	-0.189***
	(-10.75)	(-10.54)	-2.24	-2.03	(-2.35)	(-3.39)
Currently studying (Ref.No)		-1.100***		-1.235***		-0.824***
		(-10.94)		(-17.30)		(-15.23)
Observations	18172	18172	15616	15616	12865	12865

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – Belgium, Lithuania and Poland

	Belgium		Lithuania		Poland	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-7.420***	-6.666***	-7.579***	-6.848***	-7.679***	-6.961***
	(-60.13)	(-49.45)	(-66.42)	(-54.68)	(-86.87)	(-74.34)
19-22	-5.668***	-5.423***	-5.047***	-4.698***	-5.099***	-4.814***
	(-74.31)	(-70.74)	(-97.36)	(-84.15)	(-109.56)	(-101.29)
23-26	-4.869***	-4.876***	-4.321***	-4.209***	-4.689***	-4.599***
	(-68.34)	(-68.38)	(-86.06)	(-82.97)	(-98.10)	(-96.19)
27-30	-4.528***	-4.599***	-4.515***	-4.483***	-4.863***	-4.890***
	(-61.18)	(-61.52)	(-72.61)	(-71.64)	(-88.34)	(-87.92)
30-35	-4.880***	-4.943***	-5.000***	-4.991***	-5.163***	-5.190***
	(-54.43)	(-54.87)	(-55.90)	(-55.66)	(-74.97)	(-75.11)
35 +	-6.769***	-6.809***	-6.967***	-6.973***	-6.840***	-6.869***
	(-55.08)	(-55.37)	(-49.87)	(-49.93)	(-77.25)	(-77.54)
Education (Ref Medium)	0.1	0.0354	-0.0652	-0.206**	0.506***	0.327***
Primary	-1.75	-0.62	(-0.97)	(-3.03)	-12.11	-7.71
Tertiary	-0.333***	-0.137*	-0.399***	-0.135**	-0.602***	-0.123**
	(-6.31)	(-2.52)	(-8.84)	(-2.78)	(-14.93)	(-2.72)
Cohorts (Ref. 1940-1949)						
1950-1959	0.307***	0.327***	0.0816	0.0189	0.0791	0.0796
	-4.6	-4.91	-1.44	-0.33	-1.62	-1.63
1960-1969	0.293***	0.343***	0.310***	0.251***	0.347***	0.373***
	-4.41	-5.19	-5.63	-4.56	-6.94	-7.46
1970-1979	0.254***	0.317***	0.244***	0.201***	0.518***	0.548***
	-3.53	-4.42	-4.16	-3.42	-10.67	-11.29
Currently studying (Ref.No)		-1.152***		-0.783***		-1.048***
		(-12.61)		(-13.70)		(-21.31)
Observations	11419	11419	13136	13136	21648	21648

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – The Czech Republic, Sweden, Italy

	The Czech Republic		Sweden		Italy	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-6.778***	-5.987***	-6.630***	-6.354***	-7.788***	-7.351***
	(-78.42)	(-61.65)	(-76.94)	(-67.95)	(-115.36)	(-105.25)
19-22	-4.595***	-4.380***	-5.115***	-4.947***	-5.677***	-5.501***
	(-94.60)	(-88.99)	(-93.80)	(-84.71)	(-159.01)	(-151.24)
23-26	-4.303***	-4.243***	-4.457***	-4.353***	-4.948***	-4.869***
	(-81.53)	(-80.40)	(-85.68)	(-81.53)	(-149.05)	(-147.13)
27-30	-4.514***	-4.539***	-4.132***	-4.087***	-4.677***	-4.660***
	(-67.94)	(-67.64)	(-73.07)	(-71.88)	(-134.61)	(-134.09)
30-35	-5.288***	-5.318***	-3.980***	-3.965***	-4.754***	-4.752***
	(-48.16)	(-48.36)	(-61.93)	(-61.49)	(-119.01)	(-118.77)
35 +	-6.961***	-6.979***	-5.321***	-5.324***	-6.155***	-6.137***
	(-46.20)	(-46.34)	(-64.92)	(-64.94)	(-128.42)	(-128.10)
Education (Ref Medium)	0.0505	-0.0877	0.188**	0.138*	0.358***	0.288***
Primary	-0.95	(-1.64)	-2.87	-2.09	-14.84	-11.85
Tertiary	-0.499***	-0.00992	-0.296***	-0.189***	-0.363***	-0.0571
	(-8.29)	(-0.15)	(-7.51)	(-4.50)	(-10.91)	(-1.64)
Cohorts (Ref. 1940-1949)						
1950-1959	0.0289	0.0484	-0.160**	-0.162**	0.148***	0.134***
	-0.52	-0.87	(-2.99)	(-3.02)	-4.94	-4.46
1960-1969	0.114*	0.112*	-0.205***	-0.196***	-0.110***	-0.114***
	-2.05	-2.01	(-3.93)	(-3.75)	(-3.66)	(-3.81)
1970-1979	-0.242***	-0.263***	-0.282***	-0.290***	-0.267***	-0.259***
	(-4.21)	(-4.56)	(-5.06)	(-5.20)	(-7.96)	(-7.75)
Currently studying (Ref.No)		-1.125***		-0.343***		-1.136***
		(-15.73)		(-7.53)		(-20.98)
Observations	12711	12711	13532	13532	52899	52899

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child 1st wave – models for each country

Transition to the second child – Bulgaria and Russia

	Bulgaria			Russia		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.639***	-4.636***	-4.449***	-4.916***	-4.907***	-4.763***
	(-82.32)	(-81.70)	(-77.21)	(-78.42)	(-77.61)	(-74.61)
2-4	-4.402***	-4.400***	-4.211***	-4.718***	-4.713***	-4.570***
	(-77.55)	(-77.32)	(-72.81)	(-74.74)	(-74.43)	(-71.54)
4-6	-4.606***	-4.605***	-4.407***	-4.772***	-4.769***	-4.617***
	(-71.67)	(-71.62)	(-67.37)	(-70.61)	(-70.50)	(-67.65)
6-8	-5.240***	-5.240***	-5.031***	-5.097***	-5.096***	-4.930***
	(-61.84)	(-61.83)	(-58.62)	(-64.90)	(-64.87)	(-62.24)
8+	-6.925***	-6.925***	-6.732***	-6.584***	-6.586***	-6.449***
	(-81.44)	(-81.44)	(-78.13)	(-93.30)	(-93.27)	(-90.41)
Education (Ref Medium)						
Primary	0.613***	0.612***	0.556***	0.318***	0.316***	0.293***
	-13.63	-13.57	-12.24	-4.37	-4.34	-4.02
Tertiary	-0.348***	-0.341***	-0.201***	-0.184***	-0.175***	-0.103*
	(-7.00)	(-6.52)	(-3.76)	(-4.26)	(-3.96)	(-2.31)
Cohorts (Ref. 1940-1949)						
1950-1959	0.243***	0.242***	0.187**	0.262***	0.262***	0.262***
	-3.99	-3.98	-3.06	-4.64	-4.63	-4.63
1960-1969	0.263***	0.263***	0.180***	0.237***	0.236***	0.170**
	-4.87	-4.87	-3.32	-3.89	-3.86	-2.78
1970-1979	-0.169**	-0.170**	-0.313***	-0.170*	-0.171*	-0.308***
	(-2.85)	(-2.86)	(-5.20)	(-2.35)	(-2.35)	(-4.22)
Currently studying (Ref.No)		-0.0304	-0.188*		-0.0734	-0.210**
		(-0.41)	(-2.47)		(-1.04)	(-2.93)
Age at first childbirth (Ref. <25)						
25-30			-0.572***			-0.357***
			(-8.75)			(-5.73)
30-35			-1.062***			-1.524***
			(-7.44)			(-9.39)
35+			-3.229***			-2.312***
			(-4.56)			(-5.65)
Observations	12790	12790	12790	13589	13589	13589

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Georgia and Germany

	Georgia			Germany		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-3.639***	-3.619***	-3.619***	-4.393***	-4.394***	-4.296***
	(-70.35)	(-69.52)	(-69.52)	(-72.15)	(-71.75)	(-68.09)
2-4	-4.039***	-4.032***	-4.032***	-4.324***	-4.325***	-4.229***
	(-65.39)	(-65.20)	(-65.20)	(-66.93)	(-66.77)	(-63.76)
4-6	-4.475***	-4.475***	-4.475***	-4.795***	-4.795***	-4.697***
	(-56.56)	(-56.53)	(-56.53)	(-60.63)	(-60.60)	(-58.42)
6-8	-5.209***	-5.212***	-5.212***	-5.314***	-5.314***	-5.220***
	(-44.13)	(-44.14)	(-44.14)	(-51.62)	(-51.62)	(-50.19)
8+	-6.915***	-6.920***	-6.920***	-7.108***	-7.108***	-7.050***
	(-59.05)	(-59.08)	(-59.08)	(-69.36)	(-69.36)	(-68.28)
Education (Ref Medium)						
Primary	0.219**	0.205**	0.205**	0.141*	0.141*	0.148*
	-3.17	-2.96	-2.96	-2.07	-2.07	-2.16
Tertiary	-0.289***	-0.249***	-0.249***	0.119*	0.118*	0.194***
	(-6.27)	(-5.22)	(-5.22)	-2.2	-2.15	-3.48
Cohorts (Ref. 1940-1949)						
1950-1959	0.216***	0.212***	0.212***	-0.0481	-0.0482	-0.0199
	-3.66	-3.6	-3.6	(-0.72)	(-0.72)	(-0.30)
1960-1969	0.329***	0.328***	0.328***	0.197**	0.198**	0.185**
	-5.65	-5.62	-5.62	-3.11	-3.11	-2.89
1970-1979	0.116	0.123	0.123	0.193*	0.193*	0.127
	-1.85	-1.96	-1.96	-2.46	-2.46	-1.61
Currently studying (Ref.No)		-0.200**	-0.200**		0.00851	-0.101
		(-2.93)	(-2.93)		-0.09	(-1.06)
Age at first childbirth (Ref. <25)						
25-30						-0.0794
						(-1.51)
30-35						-0.343***
						(-4.36)
35+						-1.262***
						(-6.88)
Observations	7107	7107	7107	8267	8267	8267

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – France and Hungary

	France			Hungary		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.252***	-4.256***	-4.112***	-4.575***	-4.565***	-4.433***
	(-72.86)	(-72.34)	(-68.22)	(-98.78)	(-98.47)	(-93.58)
2-4	-4.034***	-4.037***	-3.889***	-4.298***	-4.297***	-4.171***
	(-66.67)	(-66.42)	(-62.45)	(-91.73)	(-91.74)	(-87.47)
4-6	-4.470***	-4.472***	-4.308***	-4.681***	-4.686***	-4.549***
	(-60.10)	(-60.03)	(-56.78)	(-81.99)	(-82.02)	(-78.51)
6-8	-5.096***	-5.098***	-4.925***	-5.147***	-5.154***	-5.002***
	(-49.63)	(-49.63)	(-47.40)	(-68.79)	(-68.83)	(-66.10)
8+	-6.778***	-6.778***	-6.634***	-6.984***	-6.992***	-6.852***
	(-69.77)	(-69.77)	(-67.52)	(-95.44)	(-95.46)	(-92.59)
Education (Ref Medium)						
Primary	0.152**	0.155**	0.115*	0.271***	0.268***	0.220***
	-3.08	-3.12	-2.3	-6.5	-6.44	-5.26
Tertiary	0.157**	0.154**	0.275***	0.129**	0.182***	0.319***
	-3.05	-2.97	-5.15	-2.59	-3.48	-5.83
Cohorts (Ref. 1940-1949)						
1950-1959	0.0109	0.00995	0.00923	0.168***	0.171***	0.154***
	-0.19	-0.17	-0.16	-3.63	-3.68	-3.31
1960-1969	0.164**	0.164**	0.177**	0.373***	0.376***	0.337***
	-2.79	-2.79	-2.99	-7.5	-7.58	-6.79
1970-1979	0.224**	0.225**	0.156*	0.0474	0.0548	-0.00971
	-3.24	-3.26	-2.25	-0.81	-0.94	(-0.17)
Currently studying (Ref.No)		0.0433	-0.0841		-0.267**	-0.452***
		-0.52	(-1.00)		(-2.86)	(-4.72)
Age at first childbirth (Ref. <25)						
25-30			-0.228***			-0.346***
			(-4.74)			(-6.67)
30-35			-0.603***			-1.167***
			(-7.03)			(-8.95)
35+			-1.543***			-1.503***
			(-7.31)			(-5.19)
Observations	7646	7646	7646	12493	12493	12493

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – The Netherlands and Romania

	The Netherlands			Romania		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-3.521***	-3.514***	-3.334***	-4.432***	-4.420***	-4.233***
	(-58.76)	(-58.61)	(-49.59)	(-75.65)	(-74.99)	(-69.99)
2-4	-3.353***	-3.350***	-3.149***	-4.601***	-4.591***	-4.389***
	(-49.78)	(-49.74)	(-42.63)	(-71.98)	(-71.56)	(-66.70)
4-6	-4.322***	-4.321***	-4.104***	-4.979***	-4.970***	-4.756***
	(-41.71)	(-41.71)	(-37.90)	(-66.59)	(-66.34)	(-62.09)
6-8	-4.901***	-4.902***	-4.696***	-5.582***	-5.575***	-5.353***
	(-33.23)	(-33.24)	(-31.12)	(-56.74)	(-56.63)	(-53.61)
8+	-6.831***	-6.835***	-6.655***	-7.398***	-7.393***	-7.198***
	(-41.33)	(-41.35)	(-39.45)	(-78.62)	(-78.55)	(-75.45)
Education (Ref Medium)						
Primary	-0.093	-0.0957	-0.186***	0.439***	0.432***	0.376***
	(-1.71)	(-1.76)	(-3.35)	-9.63	-9.44	-8.18
Tertiary	-0.00118	0.0212	0.149*	-0.417***	-0.386***	-0.135
	(-0.02)	-0.35	-2.42	(-4.37)	(-3.98)	(-1.35)
Cohorts (Ref. 1940-1949)						
1950-1959	-0.195**	-0.193**	-0.141*	0.140*	0.138*	0.110*
	(-3.22)	(-3.19)	(-2.32)	-2.52	-2.48	-1.98
1960-1969	-0.206***	-0.213***	-0.137*	0.0551	0.0538	-0.0163
	(-3.50)	(-3.62)	(-2.29)	-0.89	-0.87	(-0.26)
1970-1979	-0.735***	-0.736***	-0.805***	-0.0764	-0.0797	-0.192**
	(-7.86)	(-7.88)	(-8.60)	(-1.11)	(-1.15)	(-2.77)
Currently studying (Ref.No)		-0.337	-0.671***		-0.224	-0.357**
		(-1.96)	(-3.78)		(-1.69)	(-2.68)
Age at first childbirth (Ref. <25)						
25-30			-0.182***			-0.477***
			(-3.34)			(-7.58)
30-35			-0.481***			-1.026***
			(-6.88)			(-7.23)
35+			-1.324***			-2.176***
			(-8.27)			(-5.31)
Observations	5313	5313	5313	10256	10256	10256

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Estonia and Belgium

	Estonia			Belgium		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.361***	-4.352***	-4.211***	-4.040***	-4.037***	-3.919***
	(-74.73)	(-73.69)	(-69.25)	(-50.64)	(-50.59)	(-47.94)
2-4	-4.509***	-4.503***	-4.364***	-4.026***	-4.025***	-3.902***
	(-69.92)	(-69.46)	(-65.78)	(-47.45)	(-47.44)	(-44.94)
4-6	-4.619***	-4.614***	-4.473***	-4.701***	-4.700***	-4.571***
	(-64.12)	(-63.91)	(-60.79)	(-43.44)	(-43.44)	(-41.59)
6-8	-5.045***	-5.042***	-4.895***	-5.315***	-5.315***	-5.179***
	(-55.85)	(-55.79)	(-53.42)	(-36.46)	(-36.47)	(-35.22)
8+	-6.459***	-6.460***	-6.331***	-7.064***	-7.064***	-6.965***
	(-82.50)	(-82.50)	(-79.58)	(-49.62)	(-49.63)	(-48.55)
Education (Ref Medium)						
Primary	0.189**	0.186**	0.136*	-0.1	-0.103	-0.123
	2.79	2.74	2.01	(-1.48)	(-1.52)	(-1.81)
Tertiary	-0.124*	-0.112*	-0.0278	0.246***	0.252***	0.360***
	(-2.52)	(-2.20)	(-0.54)	4.02	4.11	5.66
Cohorts (Ref. 1940-1949)						
1950-1959	0.149*	0.147*	0.11	-0.0203	-0.0178	0.00601
	2.47	2.44	1.82	(-0.26)	(-0.23)	0.08
1960-1969	0.209***	0.206**	0.135*	0.180*	0.184*	0.209**
	3.34	3.29	2.15	2.36	2.41	2.74
1970-1979	-0.0722	-0.0745	-0.181*	0.337***	0.344***	0.316***
	(-1.01)	(-1.04)	(-2.49)	3.97	4.04	3.71
Currently studying (Ref.No)		-0.0751	-0.194*		-0.133	-0.287*
		(-1.00)	(-2.54)		(-1.12)	(-2.36)
Age at first childbirth (Ref. <25)						
25-30			-0.296***			-0.218***
			(-4.80)			(-3.69)
30-35			-0.900***			-0.435***
			(-6.21)			(-4.71)
35+			-1.364***			-1.323***
			(-4.49)			(-5.67)
Observations	8791	8791	8791	4791	4791	4791

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Lithuania and Poland

	Lithuania			Poland		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.568***	-4.567***	-4.399***	-3.632***	-3.622***	-3.434***
	(-71.59)	(-70.58)	(-65.55)	(-75.13)	(-74.52)	(-69.47)
2-4	-4.503***	-4.503***	-4.337***	-3.773***	-3.766***	-3.548***
	(-67.36)	(-66.95)	(-62.53)	(-68.63)	(-68.37)	(-63.16)
4-6	-4.855***	-4.854***	-4.683***	-4.089***	-4.083***	-3.834***
	(-61.52)	(-61.41)	(-57.79)	(-61.44)	(-61.29)	(-56.39)
6-8	-5.309***	-5.308***	-5.128***	-4.457***	-4.452***	-4.183***
	(-53.29)	(-53.26)	(-50.53)	(-52.86)	(-52.78)	(-48.76)
8+	-7.052***	-7.052***	-6.906***	-5.703***	-5.700***	-5.426***
	(-73.53)	(-73.53)	(-70.99)	(-70.40)	(-70.38)	(-65.23)
Education (Ref Medium)						
Primary	0.0717	0.0714	0.0448	0.262***	0.254***	0.197***
	-0.86	-0.85	-0.53	-5.69	-5.52	-4.24
Tertiary	-0.129*	-0.128*	-0.0492	-0.320***	-0.274***	-0.0472
	(-2.18)	(-2.10)	(-0.80)	(-6.29)	(-5.00)	(-0.82)
Cohorts (Ref. 1940-1949)						
1950-1959	0.150*	0.149*	0.133	-0.102	-0.106*	-0.0754
	-2.13	-2.13	-1.89	(-1.94)	(-2.01)	(-1.43)
1960-1969	0.264***	0.264***	0.198**	-0.242***	-0.240***	-0.273***
	-3.89	-3.88	-2.91	(-4.35)	(-4.31)	(-4.89)
1970-1979	0.081	0.081	-0.0344	-0.235***	-0.234***	-0.372***
	-1.04	-1.04	(-0.44)	(-4.35)	(-4.33)	(-6.84)
Currently studying (Ref.No)		-0.00572	-0.132		-0.139*	-0.308***
		(-0.07)	(-1.49)		(-2.12)	(-4.56)
Age at first childbirth (Ref. <25)						
25-30			-0.302***			-0.413***
			(-4.94)			(-8.88)
30-35			-0.696***			-0.910***
			(-5.61)			(-9.71)
35+			-1.489***			-2.124***
			(-4.67)			(-9.87)
Observations	8483	8483	8483	9882	9882	9882

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – The Czech Republic, Sweden and Italy

	The Czech Republic			Sweden			Italy		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.333***	-4.316***	-4.125***	-4.094***	-4.064***	-4.042***	-4.577***	-4.575***	-4.393***
	(-74.76)	(-73.68)	(-69.66)	(-79.08)	(-75.81)	(-69.60)	(-115.72)	(-115.60)	(-103.19)
2-4	-4.230***	-4.217***	-4.018***	-3.699***	-3.669***	-3.646***	-4.199***	-4.198***	-4.019***
	(-68.65)	(-68.07)	(-64.05)	(-68.36)	(-65.73)	(-61.44)	(-106.08)	(-106.03)	(-94.40)
4-6	-4.550***	-4.540***	-4.320***	-4.325***	-4.297***	-4.269***	-4.429***	-4.428***	-4.246***
	(-61.08)	(-60.82)	(-57.12)	(-57.18)	(-56.01)	(-54.10)	(-99.43)	(-99.41)	(-89.84)
6-8	-5.183***	-5.177***	-4.933***	-4.722***	-4.697***	-4.664***	-4.980***	-4.979***	-4.793***
	(-50.16)	(-50.07)	(-47.24)	(-46.68)	(-46.17)	(-45.07)	(-88.23)	(-88.23)	(-81.61)
8+	-6.787***	-6.785***	-6.555***	-6.066***	-6.055***	-6.039***	-6.750***	-6.750***	-6.577***
	(-70.39)	(-70.38)	(-67.25)	(-66.53)	(-66.35)	(-64.62)	(-120.12)	(-120.13)	(-112.63)
Education (Ref Medium)									
Primary	0.183**	0.174**	0.128*	-0.145*	-0.164*	-0.175*	0.0918**	0.0918**	0.0328
	-2.99	-2.84	-2.08	(-2.05)	(-2.30)	(-2.43)	-3.15	-3.15	-1.11
Tertiary	-0.117	-0.0787	0.151	0.104*	0.118**	0.138**	0.0975*	0.107*	0.199***
	(-1.56)	(-1.01)	-1.89	-2.47	-2.75	-3.12	-2.3	-2.45	-4.47
Cohorts (Ref. 1940-1949)									
1950-1959	0.140*	0.136*	0.130*	0.0424	0.0412	0.0541	-0.0402	-0.04	-0.0689
	-2.16	-2.1	-2	-0.73	-0.71	-0.93	(-1.14)	(-1.14)	(-1.95)
1960-1969	0.115	0.111	0.0337	0.341***	0.341***	0.342***	0.0462	0.046	0.0364
	-1.78	-1.71	-0.52	-6.11	-6.11	-6.1	-1.3	-1.29	-1.02
1970-1979	-0.0102	-0.0186	-0.142*	0.405***	0.397***	0.373***	0.396***	0.396***	0.343***
	(-0.14)	(-0.26)	(-1.98)	-6.77	-6.62	-6.19	-9.6	-9.6	-8.29
Currently studying (Ref.No)		-0.197	-0.392***		-0.0968*	-0.129**		-0.0709	-0.176*
		(-1.82)	(-3.55)		(-2.17)	(-2.75)		(-0.88)	(-2.17)
Age at first childbirth (Ref. <25)									
25-30			-0.528***			0.0272			-0.210***
			(-7.69)			-0.58			(-7.21)
30-35			-1.482***			-0.0174			-0.313***
			(-8.24)			(-0.28)			(-7.45)
35+			-1.853***			-0.605***			-0.848***
			(-5.21)			(-4.96)			(-9.46)
Observations	7283	7283	7283	6363	6363	6363	24298	24298	24298

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child 1st wave – models for each country

Transition to the second child – Bulgaria and Russia

	Bulgaria			Russia		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-7.288***	-7.300***	-6.768***	-6.002***	-6.023***	-5.258***
	(-44.35)	(-44.33)	(-39.24)	(-46.97)	(-46.97)	(-39.28)
2-4.	-7.311***	-7.320***	-6.783***	-6.172***	-6.187***	-5.423***
	(-44.22)	(-44.24)	(-39.15)	(-46.08)	(-46.13)	(-38.77)
4-6.	-7.946***	-7.952***	-7.419***	-6.265***	-6.271***	-5.499***
	(-42.32)	(-42.34)	(-38.11)	(-44.97)	(-45.06)	(-37.86)
6+	-9.808***	-9.811***	-9.328***	-7.717***	-7.711***	-6.987***
	(-55.97)	(-55.97)	(-51.34)	(-64.16)	(-64.20)	(-55.12)
Education (Ref Medium)						
Primary	1.829***	1.836***	1.663***	0.472***	0.472***	0.294*
	-15.6	-15.64	-13.97	-3.81	-3.8	-2.34
Tertiary	-0.383	-0.457*	-0.0287	-0.343***	-0.374***	-0.182*
	(-1.77)	(-2.02)	(-0.12)	(-3.81)	(-4.10)	(-1.97)
Cohorts (Ref. 1940-1949)						
1950-1959	0.571***	0.566***	0.416**	0.527***	0.526***	0.487***
	-3.89	-3.85	-2.81	-4.69	-4.68	-4.3
1960-1969	0.612***	0.610***	0.429**	0.520***	0.520***	0.165
	-4.49	-4.47	-3.11	-4.12	-4.13	-1.29
1970-1979	0.321*	0.324*	0.0502	0.408*	0.413*	-0.0514
	-1.99	-2	-0.31	-2.4	-2.43	(-0.30)
Currently studying (Ref.No)		0.402	0.111		0.422*	0.0232
		-1.34	-0.36		-2.39	-0.13
Age at second childbirth (Ref. <25)						
25-30			-1.015***			-1.081***
			(-6.86)			(-11.35)
30-35			-1.157***			-1.788***
			(-4.14)			(-10.19)
35+			-1.598*			-1.818***
			(-2.24)			(-5.06)
Observations	9952	9952	9952	8302	8302	8302

t statistics in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Georgia and Germany

	Georgia			Germany		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.974*** (-59.12)	-4.992*** (-58.91)	-4.992*** (-58.91)	-5.545*** (-48.57)	-5.548*** (-48.37)	-5.152*** (-43.09)
2-4.	-5.074*** (-56.57)	-5.085*** (-56.60)	-5.085*** (-56.60)	-5.614*** (-47.36)	-5.617*** (-47.22)	-5.230*** (-42.12)
4-6.	-5.540*** (-52.41)	-5.546*** (-52.47)	-5.546*** (-52.47)	-6.130*** (-43.89)	-6.132*** (-43.83)	-5.765*** (-39.84)
6+	-7.163*** (-75.75)	-7.164*** (-75.76)	-7.164*** (-75.76)	-7.578*** (-63.71)	-7.580*** (-63.67)	-7.296*** (-58.47)
Education (Ref Medium)						
Primary	0.641*** -7.22	0.650*** -7.31	0.650*** -7.31	0.397*** -3.64	0.398*** -3.65	0.280* -2.54
Tertiary	-0.515*** (-5.91)	-0.543*** (-6.13)	-0.543*** (-6.13)	-0.0389 (-0.39)	-0.0421 (-0.41)	0.113 -1.1
Cohorts (Ref. 1940-1949)						
1950-1959	0.144 -1.67	0.152 -1.76	0.152 -1.76	0.145 -1.22	0.145 -1.22	0.251* -2.12
1960-1969	0.116 -1.32	0.118 -1.33	0.118 -1.33	0.480*** -4.25	0.481*** -4.25	0.592*** -5.24
1970-1979	-0.284* (-2.47)	-0.281* (-2.45)	-0.281* (-2.45)	0.566*** -3.72	0.568*** -3.73	0.432** -2.85
Currently studying (Ref.No)		0.332* -2	0.332* -2		0.0648 -0.32	
Age at second childbirth (Ref. <25)						
25-30						-0.468*** (-5.17)
30-35						-0.906*** (-7.27)
35+						-2.087*** (-6.44)
Observations	8056	8056	8056	6049	6049	6049
t statistics in parentheses	t statistics in parentheses					
* p<0.05	* p<0.05	** p<0.01	*** p<0.001			

Transition to the second child – France and Hungary

	France			Hungary		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.120***	-5.143***	-4.566***	-6.370***	-6.372***	-5.845***
	(-57.38)	(-57.29)	(-47.80)	(-63.63)	(-63.61)	(-53.70)
2-4.	-4.997***	-5.017***	-4.426***	-6.498***	-6.498***	-5.976***
	(-54.97)	(-54.95)	(-45.27)	(-62.47)	(-62.46)	(-53.28)
4-6.	-5.545***	-5.561***	-4.956***	-6.788***	-6.788***	-6.268***
	(-51.27)	(-51.30)	(-43.35)	(-59.45)	(-59.44)	(-51.54)
6+	-7.215***	-7.223***	-6.663***	-8.183***	-8.182***	-7.692***
	(-72.58)	(-72.59)	(-62.67)	(-86.47)	(-86.46)	(-74.70)
Education (Ref Medium)						
Primary	0.494***	0.511***	0.322***	0.852***	0.853***	0.699***
	-6.81	-7.01	-4.36	-11.72	-11.73	-9.42
Tertiary	-0.0225	-0.0469	0.243**	0.0151	0.0061	0.245*
	(-0.26)	(-0.54)	-2.72	-0.14	-0.06	-2.2
Cohorts (Ref. 1940-1949)						
1950-1959	-0.104	-0.112	-0.0791	0.466***	0.465***	0.335***
	(-1.27)	(-1.36)	(-0.97)	-5.15	-5.13	-3.66
1960-1969	0.164	0.163	0.282***	0.793***	0.791***	0.626***
	-1.91	-1.9	-3.31	-8.18	-8.15	-6.39
1970-1979	0.341**	0.353**	0.221	1.150***	1.148***	0.900***
	-2.95	-3.06	-1.92	-10.06	-10.03	-7.76
Currently studying (Ref.No)		0.358*	-0.0443		0.195	-0.0821
		-2.54	(-0.31)		-0.69	(-0.29)
Age at second childbirth (Ref. <25)						
25-30			-0.719***			-0.704***
			(-10.14)			(-8.97)
30-35			-1.383***			-0.984***
			(-12.20)			(-6.98)
35+			-1.904***			-1.531***
			(-7.81)			(-3.39)
Observations	6792	6792	6792	10899	10899	10899

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – The Netherlands and Romania

	The Netherlands			Romania		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.089***	-5.088***	-4.549***	-5.639***	-5.631***	-5.138***
	(-48.21)	(-48.19)	(-37.39)	(-51.94)	(-51.61)	(-44.49)
2-4.	-5.011***	-5.012***	-4.472***	-6.128***	-6.121***	-5.602***
	(-46.56)	(-46.57)	(-36.17)	(-51.44)	(-51.18)	(-44.47)
4-6.	-5.818***	-5.820***	-5.275***	-6.723***	-6.716***	-6.183***
	(-43.15)	(-43.16)	(-35.46)	(-47.71)	(-47.55)	(-42.11)
6+	-8.071***	-8.073***	-7.597***	-8.444***	-8.439***	-7.940***
	(-54.09)	(-54.10)	(-46.94)	(-66.83)	(-66.73)	(-60.14)
Education (Ref Medium)						
Primary	0.00367	0.0037	-0.176*	1.262***	1.259***	1.088***
	-0.04	-0.04	(-1.99)	-14.21	-14.16	-12.07
Tertiary	-0.127	-0.116	0.145	-0.817*	-0.802*	-0.43
	(-1.26)	(-1.15)	-1.41	(-2.51)	(-2.46)	(-1.31)
Cohorts (Ref. 1940-1949)						
1950-1959	0.114	0.115	0.204*	0.164	0.161	0.102
	-1.16	-1.17	-2.08	-1.92	-1.88	-1.19
1960-1969	0.300**	0.300**	0.506***	-0.0108	-0.0147	-0.154
	-3.12	-3.11	-5.19	(-0.10)	(-0.14)	(-1.45)
1970-1979	-0.0823	-0.0818	-0.22	-0.204	-0.208	-0.424**
	(-0.43)	(-0.43)	(-1.16)	(-1.54)	(-1.57)	(-3.17)
Currently studying (Ref.No)		-1.039	-1.94		-0.213	-0.373
		(-1.04)	(-1.93)		(-0.63)	(-1.10)
Age at second childbirth (Ref. <25)						
25-30			-0.488***			-0.673***
			(-5.43)			(-7.65)
30-35			-1.045***			-1.243***
			(-9.41)			(-7.50)
35+			-1.830***			-1.570***
			(-8.66)			(-3.81)
Observations	6154	6154	6154	7000	7000	7000

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Estonia and Belgium

	Estonia			Belgium		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.847***	-5.890***	-5.339***	-5.380***	-5.390***	-4.834***
	(-50.59)	(-50.69)	(-41.81)	(-41.03)	(-41.01)	(-34.91)
2-4.	-6.027***	-6.061***	-5.517***	-5.366***	-5.369***	-4.806***
	(-49.07)	(-49.19)	(-41.16)	(-39.98)	(-39.98)	(-33.82)
4-6.	-6.378***	-6.402***	-5.869***	-5.922***	-5.922***	-5.363***
	(-45.97)	(-46.11)	(-39.55)	(-38.27)	(-38.27)	(-33.16)
6+	-7.459***	-7.459***	-6.970***	-7.445***	-7.445***	-6.915***
	(-69.94)	(-70.06)	(-59.16)	(-52.74)	(-52.73)	(-46.44)
Education (Ref Medium)						
Primary	0.548***	0.552***	0.442***	0.592***	0.600***	0.481***
	-5.14	-5.18	-4.12	-5.61	-5.68	-4.53
Tertiary	-0.364***	-0.433***	-0.242*	0.508***	0.496***	0.649***
	(-3.73)	(-4.31)	(-2.36)	-4.96	-4.83	-6.22
Cohorts (Ref. 1940-1949)						
1950-1959	0.413***	0.418***	0.318**	0.0104	0.0115	-0.0378
	-3.77	-3.81	-2.87	-0.09	-0.1	(-0.33)
1960-1969	0.760***	0.775***	0.517***	0.257*	0.247*	0.257*
	-6.64	-6.77	-4.4	-2.25	-2.16	-2.25
1970-1979	0.627***	0.636***	0.306*	0.786***	0.763***	0.667***
	-4.26	-4.32	-2.04	-5.68	-5.48	-4.84
Currently studying (Ref.No)		0.565***	0.272		0.412*	0.134
		-3.64	-1.72		-2.01	-0.65
Age at second childbirth (Ref. <25)						
25-30			-0.559***			-0.704***
			(-6.15)			(-7.65)
30-35			-1.319***			-0.989***
			(-7.74)			(-8.21)
35+			-1.170***			-1.403***
			(-3.60)			(-4.73)
Observations	6755	6755	6755	4037	4037	4037

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Lithuania and Poland

	Lithuania			Poland		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.871***	-5.886***	-5.231***	-4.017***	-4.011***	-3.811***
	(-43.46)	(-43.36)	(-34.42)	(-72.89)	(-72.51)	(-65.24)
2-4.	-6.034***	-6.047***	-5.387***	-4.151***	-4.145***	-3.936***
	(-42.20)	(-42.17)	(-33.85)	(-66.40)	(-66.14)	(-59.97)
4-6.	-6.295***	-6.306***	-5.648***	-4.288***	-4.283***	-4.065***
	(-40.09)	(-40.10)	(-32.87)	(-59.34)	(-59.17)	(-54.09)
6+	-7.657***	-7.662***	-7.055***	-4.512***	-4.509***	-4.251***
	(-59.85)	(-59.84)	(-48.85)	(-72.75)	(-72.65)	(-64.06)
Education (Ref Medium)						
Primary	0.440**	0.447**	0.359*	0.370***	0.367***	0.307***
	-2.93	-2.98	-2.39	-7.3	-7.21	-5.98
Tertiary	-0.247	-0.277*	-0.134	-0.443***	-0.402***	-0.206*
	(-1.86)	(-2.04)	(-0.97)	(-5.05)	(-4.31)	(-2.16)
Cohorts (Ref. 1940-1949)						
1950-1959	0.238	0.247	0.144	-0.180**	-0.183***	-0.162**
	-1.74	-1.8	-1.06	(-3.29)	(-3.32)	(-2.96)
1960-1969	0.304*	0.308*	0.0588	-0.652***	-0.649***	-0.655***
	-2.19	-2.22	-0.42	(-10.01)	(-9.96)	(-10.06)
1970-1979	0.237	0.232	-0.175	-0.697***	-0.696***	-0.787***
	-1.29	-1.26	(-0.93)	(-9.42)	(-9.41)	(-10.63)
Currently studying (Ref.No)		0.27	0.0647		-0.136	-0.266*
		-1.17	-0.28		(-1.23)	(-2.39)
Age at second childbirth (Ref. <25)						
25-30			-0.639***			-0.303***
			(-5.90)			(-6.29)
30-35			-1.367***			-0.643***
			(-7.10)			(-7.70)
35+			-1.144***			-1.551***
			(-3.65)			(-7.01)
Observations	5820	5820	5820	7759	7759	7759

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – The Czech Republic, Sweden and Italy

	The Czech Republic			Sweden			Italy		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.940***	-5.944***	-5.445***	-5.241***	-5.257***	-4.884***	-5.933***	-5.940***	-5.173***
	(-46.95)	(-46.51)	(-40.29)	(-61.23)	(-59.75)	(-50.06)	(-74.92)	(-74.90)	(-58.70)
2-4.	-6.361***	-6.365***	-5.878***	-5.249***	-5.263***	-4.908***	-5.891***	-5.896***	-5.137***
	(-44.71)	(-44.42)	(-39.18)	(-59.03)	(-57.90)	(-49.06)	(-73.06)	(-73.07)	(-57.33)
4-6.	-6.452***	-6.455***	-5.976***	-5.593***	-5.606***	-5.258***	-6.125***	-6.130***	-5.373***
	(-43.01)	(-42.80)	(-37.99)	(-55.04)	(-54.45)	(-47.41)	(-70.80)	(-70.81)	(-56.53)
6+	-7.848***	-7.850***	-7.417***	-7.079***	-7.085***	-6.780***	-7.653***	-7.654***	-6.954***
	(-64.89)	(-64.72)	(-57.79)	(-79.40)	(-79.22)	(-69.58)	(-98.39)	(-98.38)	(-80.40)
Education (Ref Medium)									
Primary	0.613***	0.615***	0.476***	0.288**	0.296**	0.181	0.457***	0.456***	0.252***
	-5.78	-5.78	-4.43	-2.88	-2.94	-1.78	-7.49	-7.47	-4.07
Tertiary	-0.407*	-0.411*	-0.101	0.0145	0.00775	0.175*	0.255**	0.225*	0.483***
	(-2.11)	(-2.12)	(-0.51)	-0.22	-0.12	-2.53	-2.69	-2.34	-4.95
Cohorts (Ref. 1940-1949)									
1950-1959	0.248*	0.249*	0.15	0.269**	0.269**	0.327***	-0.0425	-0.0409	-0.102
	-1.97	-1.97	-1.19	-3.14	-3.14	-3.81	(-0.69)	(-0.66)	(-1.65)
1960-1969	0.388**	0.390**	0.261*	0.464***	0.463***	0.520***	0.156*	0.157*	0.150*
	-2.94	-2.95	-1.97	-5.39	-5.38	-6.04	-2.35	-2.36	-2.27
1970-1979	0.701***	0.703***	0.480**	1.061***	1.062***	0.983***	0.857***	0.862***	0.630***
	-4.45	-4.45	-3.03	-10.48	-10.49	-9.72	-9.96	-10.02	-7.3
Currently studying (Ref.No)		0.0713	-0.206		0.0558	-0.119		0.352*	0.0873
		-0.24	(-0.69)		-0.78	(-1.60)		-2.16	-0.53
Age at second childbirth (Ref. <25)									
25-30			-0.751***			-0.371***			-0.624***
			(-6.72)			(-5.12)			(-11.47)
30-35			-1.187***			-0.791***			-1.181***
			(-5.29)			(-8.33)			(-15.45)
35+			-1.680**			-0.972***			-1.490***
			(-2.88)			(-5.83)			(-11.04)
Observations	6158	6158	6158	6903	6903	6903	18531	18531	18531

Transition to the first child 2nd wave – models for each country

Transition to the first child – Bulgaria, Germany, France and Hungary

	Bulgaria		Germany		France		Hungary	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-6.355***	-5.621***	-7.555***	-6.625***	-7.710***	-6.887***	-8.385***	-7.855***
	(-90.12)	(-71.78)	(-42.02)	(-34.14)	(-55.98)	(-47.11)	(-50.69)	(-45.26)
19-22	-4.393***	-4.164***	-5.354***	-4.995***	-5.461***	-5.122***	-6.180***	-5.889***
	(-89.39)	(-83.58)	(-59.63)	(-55.09)	(-81.22)	(-74.45)	(-50.23)	(-46.83)
23-26	-4.107***	-4.084***	-4.869***	-4.807***	-4.747***	-4.671***	-5.538***	-5.382***
	(-75.46)	(-74.48)	(-54.92)	(-54.65)	(-74.35)	(-73.16)	(-45.74)	(-44.19)
27-30	-4.541***	-4.660***	-4.462***	-4.536***	-4.530***	-4.569***	-5.498***	-5.422***
	(-63.15)	(-63.61)	(-49.25)	(-49.58)	(-67.36)	(-67.12)	(-44.38)	(-43.63)
30-35	-4.987***	-5.117***	-4.591***	-4.706***	-4.931***	-4.975***	-6.034***	-5.981***
	(-46.91)	(-47.74)	(-43.40)	(-43.78)	(-58.93)	(-59.07)	(-42.22)	(-41.79)
35 +	-6.401***	-6.512***	-6.274***	-6.365***	-6.976***	-6.999***	-7.408***	-7.386***
	(-43.56)	(-44.18)	(-47.15)	(-47.56)	(-59.93)	(-60.10)	(-44.42)	(-44.40)
Cohorts (Ref. 1940-1949)								
1950-1959	0.429***	0.254***	0.316**	0.195	0.276***	0.168**	0.138	0.00356
	-9.92	-5.72	-3.06	-1.88	-5.11	-3.09	-1.9	-0.05
1960-1969	-0.495***	0.0783	-0.302***	0.0478	-0.363***	-0.116*	-0.450***	-0.199***
	(-11.64)	-1.57	(-4.57)	-0.68	(-7.00)	(-2.15)	(-8.60)	(-3.45)
1970-1979	0.0183	0.0349	0.0713	0.125	-0.0443	-0.029	0.739***	0.721***
	-0.31	-0.59	-0.81	-1.42	(-0.70)	(-0.46)	-5.76	-5.62
Education (Ref Medium)								
Primary	0.0855	0.0848	0.0537	0.128	0.153*	0.194**	1.432***	1.387***
	-1.67	-1.65	-0.63	-1.5	-2.43	-3.09	-11.88	-11.49
Tertiary	-0.0187	-0.0297	0.091	0.163	0.0516	0.117	1.005***	0.954***
	(-0.35)	(-0.56)	-0.89	-1.61	-0.75	-1.69	-8.35	-7.91
Currently studying (Ref.No)		-1.193***		-1.228***		-1.172***		-0.624***
		(-20.12)		(-12.05)		(-14.98)		(-9.89)
Observations	13306	13306	6251	6251	12363	12363	10185	10185

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – Italy, Lithuania, the Czech Republic and Georgia

	Italy		Lithuania		The Czech Republic		Georgia	
Duration splines	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2	Modello 1	Modello 2
14-18	-7.788***	-7.351***	-7.503***	-6.741***	-6.917***	-6.238***	-6.710***	-5.829***
	(-115.36)	(-105.25)	(-35.12)	(-29.11)	(-47.65)	(-39.34)	(-82.77)	(-61.46)
19-22	-5.677***	-5.501***	-4.884***	-4.451***	-4.437***	-4.297***	-4.598***	-4.230***
	(-159.01)	(-151.24)	(-51.54)	(-42.06)	(-63.42)	(-61.21)	(-91.54)	(-80.39)
23-26	-4.948***	-4.869***	-4.186***	-4.023***	-4.181***	-4.176***	-4.425***	-4.323***
	(-149.05)	(-147.13)	(-44.77)	(-42.64)	(-52.80)	(-52.51)	(-80.94)	(-78.59)
27-30	-4.677***	-4.660***	-4.282***	-4.223***	-4.384***	-4.438***	-4.632***	-4.668***
	(-134.61)	(-134.09)	(-37.02)	(-36.39)	(-43.40)	(-43.31)	(-69.31)	(-69.07)
30-35	-4.754***	-4.752***	-5.159***	-5.132***	-4.997***	-5.058***	-4.892***	-4.947***
	(-119.01)	(-118.77)	(-27.50)	(-27.33)	(-32.06)	(-32.30)	(-56.33)	(-56.53)
35 +	-6.155***	-6.137***	-6.760***	-6.757***	-6.553***	-6.587***	-6.224***	-6.293***
	(-128.42)	(-128.10)	(-28.38)	(-28.34)	(-33.67)	(-33.82)	(-58.48)	(-58.88)
Cohorts (Ref. 1940-1949)								
1950-1959	0.358***	0.288***	0.202*	0.028	0.178*	0.0619	0.305***	0.084
	-14.84	-11.85	-2.17	-0.29	-1.99	-0.68	-4.39	-1.19
1960-1969	-0.363***	-0.0571	-0.500***	-0.240**	-0.478***	-0.0385	-0.561***	-0.210***
	(-10.91)	(-1.64)	(-5.94)	(-2.66)	(-5.38)	(-0.39)	(-13.07)	(-4.43)
1970-1979	0.148***	0.134***	0.0434	-0.0237	-0.0846	-0.0275	0.169**	0.157**
	-4.94	-4.46	-0.44	(-0.24)	(-1.01)	(-0.33)	-3.05	-2.83
Education (Ref Medium)								
Primary	-0.110***	-0.114***	0.16	0.1	0.0645	0.0774	0.146**	0.118*
	(-3.66)	(-3.81)	-1.58	-0.98	-0.75	-0.9	-2.64	-2.14
Tertiary	-0.267***	-0.259***	0.117	0.0941	-0.310***	-0.307***	0.266***	0.206***
	(-7.96)	(-7.75)	-1.1	-0.89	(-3.57)	(-3.54)	-4.59	-3.54
Currently studying (Ref.No)		-1.136***		-0.811***		-1.112***		-0.972***
		(-20.98)		(-8.09)		(-9.21)		(-17.37)
Observations	52899	52899	3638	3638	4899	4899	12854	12854

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child 2nd wave – models for each country

Transition to the second child – Bulgaria and Germany

	Bulgaria			Germany		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.505***	-4.502***	-4.352***	-4.384***	-4.377***	-4.339***
	(-73.32)	(-73.05)	(-69.62)	(-45.18)	(-44.94)	(-42.75)
2-4	-4.271***	-4.270***	-4.112***	-4.265***	-4.261***	-4.216***
	(-68.50)	(-68.39)	(-64.89)	(-42.13)	(-42.03)	(-40.33)
4-6	-4.436***	-4.436***	-4.265***	-4.769***	-4.767***	-4.712***
	(-62.91)	(-62.89)	(-59.52)	(-38.36)	(-38.34)	(-37.18)
6-8	-5.099***	-5.099***	-4.920***	-5.181***	-5.180***	-5.126***
	(-54.06)	(-54.05)	(-51.59)	(-33.46)	(-33.46)	(-32.66)
8+	-6.834***	-6.836***	-6.674***	-7.188***	-7.189***	-7.180***
	(-72.79)	(-72.76)	(-70.29)	(-44.54)	(-44.54)	(-43.99)
Education (Ref Medium)						
Primary	0.520***	0.518***	0.473***	0.183	0.181	0.15
	-10.5	-10.44	-9.5	-1.57	-1.54	-1.27
Tertiary	-0.322***	-0.312***	-0.196**	0.0685	0.0788	0.145
	(-5.84)	(-5.30)	(-3.27)	-0.87	-0.98	-1.75
Cohorts (Ref. 1940-1949)						
1950-1959	0.204**	0.204**	0.181**	-0.0513	-0.0513	0.0207
	-3.06	-3.05	-2.71	(-0.49)	(-0.49)	-0.19
1960-1969	0.137*	0.138*	0.0735	0.257*	0.256*	0.283**
	-2.29	-2.31	-1.23	-2.57	-2.56	-2.81
1970-1979	-0.191**	-0.192**	-0.301***	0.359**	0.357**	0.323**
	(-3.00)	(-3.00)	(-4.69)	-3.02	-3	-2.72
Currently studying (Ref.No)		-0.0421	-0.163		-0.113	-0.209
		(-0.49)	(-1.86)		(-0.73)	(-1.33)
Age at first childbirth (Ref. <25)						
25-30			-0.446***			0.0193
			(-6.46)			-0.25
30-35			-1.082***			-0.236*
			(-6.48)			(-2.10)
35+			-2.385***			-1.269***
			(-5.32)			(-5.08)
Observations	9669	9669	9669	3284	3284	3284

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – France and Hungary

	France			Hungary		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.259***	-4.265***	-4.098***	-6.581***	-6.580***	-6.259***
	(-58.71)	(-58.55)	(-54.99)	(-24.66)	(-24.64)	(-23.21)
2-4	-3.975***	-3.978***	-3.800***	-6.230***	-6.229***	-5.914***
	(-53.53)	(-53.47)	(-49.92)	(-23.39)	(-23.37)	(-21.97)
4-6	-4.487***	-4.490***	-4.288***	-6.695***	-6.695***	-6.380***
	(-49.01)	(-49.00)	(-45.97)	(-24.65)	(-24.64)	(-23.27)
6-8	-4.997***	-4.999***	-4.778***	-7.117***	-7.117***	-6.799***
	(-41.79)	(-41.80)	(-39.38)	(-25.26)	(-25.26)	(-23.92)
8+	-7.132***	-7.133***	-6.949***	-8.475***	-8.475***	-8.193***
	(-53.77)	(-53.77)	(-51.82)	(-30.98)	(-30.98)	(-29.77)
Education (Ref Medium)						
Primary	0.153*	0.156*	0.112	0.152	0.151	0.0994
	-2.47	-2.51	-1.79	-1.71	-1.69	-1.11
Tertiary	0.195**	0.190**	0.329***	0.179**	0.181**	0.279***
	-3.28	-3.16	-5.32	-2.75	-2.65	-3.95
Cohorts (Ref. 1940-1949)						
1950-1959	-0.111	-0.112	-0.0799	1.717***	1.717***	1.649***
	(-1.51)	(-1.52)	(-1.08)	-6.32	-6.32	-6.06
1960-1969	0.0579	0.0553	0.114	2.232***	2.232***	2.039***
	-0.8	-0.77	-1.57	-8.44	-8.44	-7.67
1970-1979	0.257**	0.257**	0.239**	2.086***	2.086***	1.863***
	-3.25	-3.26	-3.01	-7.86	-7.86	-6.99
Currently studying (Ref.No)		0.082	-0.0326		-0.00621	-0.103
		-0.86	(-0.34)		(-0.08)	(-1.35)
Age at first childbirth (Ref. <25)						
25-30			-0.303***			-0.252***
			(-5.30)			(-3.58)
30-35			-0.687***			-0.860***
			(-7.46)			(-5.58)
35+			-1.418***			-1.582***
			(-6.95)			(-3.84)
Observations	5416	5416	5416	5302	5302	5302

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – Italy and Lithuania

	Italy			Lithuania		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.577***	-4.575***	-4.393***	-4.413***	-4.390***	-4.253***
	(-115.72)	(-115.60)	(-103.19)	(-39.74)	(-38.81)	(-36.02)
2-4	-4.199***	-4.198***	-4.019***	-4.265***	-4.248***	-4.111***
	(-106.08)	(-106.03)	(-94.40)	(-37.01)	(-36.50)	(-34.13)
4-6	-4.429***	-4.428***	-4.246***	-4.486***	-4.474***	-4.325***
	(-99.43)	(-99.41)	(-89.84)	(-33.55)	(-33.34)	(-31.40)
6-8	-4.980***	-4.979***	-4.793***	-4.949***	-4.939***	-4.772***
	(-88.23)	(-88.23)	(-81.61)	(-29.18)	(-29.08)	(-27.57)
8+	-6.750***	-6.750***	-6.577***	-6.796***	-6.791***	-6.647***
	(-120.12)	(-120.13)	(-112.63)	(-41.39)	(-41.35)	(-39.79)
Education (Ref Medium)						
Primary	0.0918**	0.0918**	0.0328	0.0542	0.0412	0.0286
	-3.15	-3.15	-1.11	-0.5	-0.38	-0.26
Tertiary	0.0975*	0.107*	0.199***	-0.337**	-0.313**	-0.208
	-2.3	-2.45	-4.47	(-3.20)	(-2.90)	(-1.89)
Cohorts (Ref. 1940-1949)						
1950-1959	-0.0402	-0.04	-0.0689	0.0395	0.0333	0.0579
	(-1.14)	(-1.14)	(-1.95)	-0.34	-0.29	-0.49
1960-1969	0.0462	0.046	0.0364	0.154	0.148	0.115
	-1.3	-1.29	-1.02	-1.29	-1.24	-0.96
1970-1979	0.396***	0.396***	0.343***	0.00912	0.0154	-0.0489
	-9.6	-9.6	-8.29	-0.07	-0.12	(-0.37)
Currently studying (Ref.No)		-0.0709	-0.176*		-0.14	-0.258
		(-0.88)	(-2.17)		(-1.01)	(-1.82)
Age at first childbirth (Ref. <25)						
25-30			-0.210***			-0.290**
			(-7.21)			(-2.74)
30-35			-0.313***			-1.048***
			(-7.45)			(-3.96)
35+			-0.848***			-1.456**
			(-9.46)			(-2.89)
Observations	24298	24298	24298	2486	2486	2486

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – the Czech Republic and Georgia

	The Czech Republic			Georgia		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-4.439***	-4.431***	-4.324***	-3.582***	-3.555***	-3.344***
	(-50.91)	(-50.55)	(-48.52)	(-66.28)	(-65.33)	(-59.53)
2-4	-4.296***	-4.290***	-4.184***	-3.986***	-3.972***	-3.726***
	(-46.87)	(-46.68)	(-44.87)	(-61.34)	(-60.99)	(-55.49)
4-6	-4.587***	-4.582***	-4.461***	-4.434***	-4.430***	-4.156***
	(-41.52)	(-41.43)	(-39.86)	(-53.16)	(-53.04)	(-48.52)
6-8	-5.193***	-5.190***	-5.057***	-5.364***	-5.363***	-5.071***
	(-34.37)	(-34.35)	(-33.22)	(-40.53)	(-40.51)	(-37.86)
8+	-6.809***	-6.808***	-6.687***	-7.088***	-7.094***	-6.868***
	(-51.34)	(-51.34)	(-49.93)	(-56.76)	(-56.78)	(-54.48)
Education (Ref Medium)						
Primary	0.174	0.172	0.147	0.236**	0.217**	0.124
	-1.71	-1.69	-1.44	-3.16	-2.91	-1.65
Tertiary	0.0264	0.0502	0.262*	-0.331***	-0.279***	-0.126*
	-0.25	-0.46	-2.32	(-6.81)	(-5.53)	(-2.40)
Cohorts (Ref. 1940-1949)						
1950-1959	0.221*	0.218*	0.204*	0.221***	0.216***	0.176**
	-2.29	-2.26	-2.12	-3.58	-3.5	-2.85
1960-1969	0.203*	0.201*	0.158	0.288***	0.282***	0.212***
	-2.03	-2.01	-1.58	-4.68	-4.58	-3.44
1970-1979	0.0735	0.0713	0.0293	0.0587	0.0596	-0.113
	-0.7	-0.68	-0.28	-0.9	-0.92	(-1.72)
Currently studying (Ref.No)		-0.152	-0.287		-0.276***	-0.492***
		(-0.86)	(-1.60)		(-3.71)	(-6.43)
Age at first childbirth (Ref. <25)						
25-30			-0.208*			-0.316***
			(-2.12)			(-5.62)
30-35			-1.197***			-0.881***
			(-4.68)			(-8.84)
35+			-1.968***			-1.750***
			(-3.91)			(-8.96)
Observations	3082	3082	3082	6452	6452	6452

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the third child 2nd wave – models for each country

Transition to the third child – Bulgaria and Germany

	Bulgaria			Germany		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-7.381***	-7.385***	-6.859***	-5.583***	-5.578***	-5.097***
	(-40.31)	(-40.24)	(-35.85)	(-31.03)	(-31.00)	(-26.42)
2-4.	-7.483***	-7.486***	-6.948***	-5.616***	-5.612***	-5.134***
	(-40.23)	(-40.18)	(-35.83)	(-30.41)	(-30.40)	(-25.93)
4-6.	-8.277***	-8.280***	-7.740***	-6.078***	-6.075***	-5.593***
	(-37.97)	(-37.94)	(-34.42)	(-29.04)	(-29.03)	(-25.25)
6+	-9.966***	-9.968***	-9.471***	-7.644***	-7.645***	-7.257***
	(-51.43)	(-51.41)	(-47.23)	(-41.61)	(-41.61)	(-36.69)
Education (Ref Medium)						
Primary	2.017***	2.021***	1.855***	0.356	0.362*	0.258
	-14.89	-14.86	-13.48	-1.94	-1.97	-1.38
Tertiary	-0.359	-0.382	0.0386	0.00686	0.0216	0.243
	(-1.42)	(-1.45)	-0.14	-0.05	-0.15	-1.7
Cohorts (Ref. 1940-1949)						
1950-1959	0.535***	0.534***	0.396*	0.328	0.332	0.404*
	-3.34	-3.34	-2.46	-1.81	-1.83	-2.23
1960-1969	0.677***	0.676***	0.508***	0.438*	0.448*	0.643***
	-4.55	-4.54	-3.38	-2.5	-2.55	-3.63
1970-1979	0.488**	0.488**	0.253	0.442	0.441	0.369
	-2.94	-2.94	-1.52	-1.93	-1.92	-1.62
Currently studying (Ref.No)		0.138	-0.172		-0.371	-0.846*
		-0.31	(-0.38)		(-1.03)	(-2.30)
Age at second childbirth (Ref. <25)						
25-30			-1.121***			-0.498***
			(-6.80)			(-3.49)
30-35			-1.030***			-1.085***
			(-3.55)			(-5.97)
35+			-1.481*			-1.861***
			(-2.07)			(-5.25)
Observations	8011	8011	8011	2653	2653	2653

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the third child – France and Hungary

	France			Hungary		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.327***	-5.326***	-4.796***	-8.044***	-8.066***	-7.890***
	(-46.28)	(-46.18)	(-39.25)	(-7.98)	(-8.00)	(-7.61)
2-4.	-5.067***	-5.066***	-4.516***	-7.783***	-7.802***	-7.636***
	(-44.61)	(-44.53)	(-37.17)	(-7.73)	(-7.75)	(-7.37)
4-6.	-5.688***	-5.687***	-5.120***	-8.256***	-8.273***	-8.113***
	(-42.11)	(-42.06)	(-36.00)	(-8.17)	(-8.18)	(-7.81)
6+	-7.377***	-7.377***	-6.850***	-9.137***	-9.138***	-9.009***
	(-60.02)	(-60.00)	(-52.04)	(-9.11)	(-9.11)	(-8.75)
Education (Ref Medium)						
Primary	0.538***	0.537***	0.377***	1.193***	1.222***	1.163***
	-5.89	-5.87	-4.06	-9.33	-9.42	-9.05
Tertiary	0.0289	0.0296	0.336**	-0.0425	-0.0931	0.0238
	-0.28	-0.29	-3.19	(-0.32)	(-0.67)	-0.17
Cohorts (Ref. 1940-1949)						
1950-1959	-0.0228	-0.0223	0.0213	1.661	1.646	1.689
	(-0.21)	(-0.21)	-0.2	-1.64	-1.63	-1.64
1960-1969	0.101	0.102	0.277*	2.181*	2.161*	2.172*
	-0.94	-0.94	-2.57	-2.17	-2.15	-2.12
1970-1979	0.261*	0.262*	0.313*	2.619**	2.607**	2.583*
	-2.02	-2.03	-2.43	-2.61	-2.59	-2.51
Currently studying (Ref.No)		-0.0244	-0.199		0.226	
		(-0.14)	(-1.11)		-1.46	
Age at second childbirth (Ref. <25)						
25-30			-0.694***			-0.243*
			(-7.69)			(-1.99)
30-35			-1.348***			-0.237
			(-10.23)			(-1.36)
35+			-1.675***			-0.0826
			(-6.91)			(-0.19)
Observations	4917	4917	4917	3915	3915	3915

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the third child – Italy and Lithuania

	Italy			Lithuania		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
0-2	-5.933***	-5.940***	-5.173***	-5.567***	-5.578***	-4.779***
	(-74.92)	(-74.90)	(-58.70)	(-26.27)	(-26.07)	(-20.16)
2-4.	-5.891***	-5.896***	-5.137***	-5.824***	-5.834***	-5.029***
	(-73.06)	(-73.07)	(-57.33)	(-25.36)	(-25.24)	(-19.85)
4-6.	-6.125***	-6.130***	-5.373***	-5.994***	-6.004***	-5.184***
	(-70.80)	(-70.81)	(-56.53)	(-24.26)	(-24.18)	(-19.17)
6+	-7.653***	-7.654***	-6.954***	-7.791***	-7.796***	-7.038***
	(-98.39)	(-98.38)	(-80.40)	(-35.88)	(-35.81)	(-29.24)
Education (Ref Medium)						
Primary	0.457***	0.456***	0.252***	0.193	0.198	0.0343
	-7.49	-7.47	-4.07	-1	-1.03	-0.18
Tertiary	0.255**	0.225*	0.483***	-0.567*	-0.576*	-0.295
	-2.69	-2.34	-4.95	(-2.38)	(-2.40)	(-1.21)
Cohorts (Ref. 1940-1949)						
1950-1959	-0.0425	-0.0409	-0.102	0.0394	0.0439	-0.132
	(-0.69)	(-0.66)	(-1.65)	-0.18	-0.2	(-0.59)
1960-1969	0.156*	0.157*	0.150*	0.383	0.384	0.118
	-2.35	-2.36	-2.27	-1.74	-1.74	-0.53
1970-1979	0.857***	0.862***	0.630***	0.375	0.367	-0.013
	-9.96	-10.02	-7.3	-1.44	-1.41	(-0.05)
Currently studying (Ref.No)		0.352*	0.0873		0.13	-0.218
		-2.16	-0.53		-0.41	(-0.68)
Age at second childbirth (Ref. <25)						
25-30			-0.624***			-0.733***
			(-11.47)			(-4.19)
30-35			-1.181***			-1.770***
			(-15.45)			(-5.16)
35+			-1.490***			-2.695**
			(-11.04)			(-2.67)
Observations	18531	18531	18531	1916	1916	1916

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the third child – the Czech Republic and Georgia

	The Czech Republic			Georgia		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
2-4.	-5.747***	-5.777***	-5.296***	-4.883***	-4.890***	-4.544***
	(-31.70)	(-31.74)	(-27.57)	(-56.11)	(-55.85)	(-48.94)
4-6.	-6.418***	-6.440***	-5.969***	-5.123***	-5.127***	-4.777***
	(-29.21)	(-29.24)	(-26.08)	(-53.68)	(-53.61)	(-47.39)
6-8.	-6.596***	-6.615***	-6.153***	-5.589***	-5.592***	-5.239***
	(-27.73)	(-27.76)	(-24.98)	(-50.04)	(-50.03)	(-44.96)
8+	-7.961***	-7.970***	-7.539***	-7.278***	-7.279***	-6.964***
	(-44.39)	(-44.35)	(-39.89)	(-75.21)	(-75.22)	(-68.46)
Education (Ref Medium)						
Primary	0.754***	0.773***	0.607***	0.640***	0.644***	0.533***
	-4.39	-4.49	-3.49	-6.67	-6.7	-5.52
Tertiary	-0.527	-0.627*	-0.281	-0.462***	-0.470***	-0.229*
	(-1.86)	(-2.16)	(-0.94)	(-5.19)	(-5.24)	(-2.46)
Cohorts (Ref. 1940-1949)						
1950-1959	0.0768	0.0848	0.082	0.077	0.078	-0.036
	-0.4	-0.44	-0.43	-0.85	-0.86	(-0.39)
1960-1969	0.417*	0.418*	0.305	0.0532	0.0547	-0.0719
	-2.08	-2.09	-1.52	-0.57	-0.59	(-0.77)
1970-1979	0.325	0.31	0.268	-0.242*	-0.240*	-0.457***
	-1.36	-1.29	-1.12	(-2.19)	(-2.17)	(-4.07)
Currently studying (Ref.No)		0.746*	0.405		0.13	-0.119
		-1.98	-1.06		-0.72	(-0.66)
Age at second childbirth (Ref. <25)						
25-30			-0.834***			-0.490***
			(-4.73)			(-6.19)
30-35			-1.237***			-1.051***
			(-3.87)			(-6.80)
35+			-0.866			-1.476***
			(-1.46)			(-5.03)
Observations	2702	2702	2702	7684	7684	7684

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Appendix IV: Work and Fertility – hazard models

Transition to the first child – models for each country

Transition to the first child – Bulgaria and Germany

	Bulgaria			Germany		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
14-18	-6.299***	-6.422***	-5.676***	-7.531***	-7.524***	-6.470***
	(-81.40)	(-79.21)	(-63.20)	(-40.59)	(-40.22)	(-31.66)
19-22	-4.508***	-4.574***	-4.256***	-5.530***	-5.509***	-5.015***
	(-55.11)	(-53.83)	(-50.06)	(-43.83)	(-42.69)	(-38.15)
23-26	-4.305***	-4.313***	-4.186***	-5.069***	-5.030***	-4.840***
	(-50.07)	(-48.17)	(-47.12)	(-39.67)	(-38.54)	(-37.17)
27-30	-4.708***	-4.723***	-4.729***	-4.629***	-4.573***	-4.520***
	(-47.71)	(-46.44)	(-46.55)	(-35.89)	(-34.72)	(-34.36)
30-35	-5.139***	-5.162***	-5.180***	-4.772***	-4.721***	-4.711***
	(-40.83)	(-40.24)	(-40.42)	(-33.84)	(-32.89)	(-32.66)
35 +	-6.569***	-6.602***	-6.612***	-6.428***	-6.413***	-6.380***
	(-39.77)	(-39.57)	(-39.67)	(-39.58)	(-39.01)	(-38.76)
Currently working (Ref. No)	0.188**	0.203**	0.0972	0.151	0.14	0.00495
	-2.63	-2.83	-1.38	-1.49	-1.38	-0.05
Cohorts (Ref. 1940-1949)						
1950-1959	-0.0759	0.00417	0.0188	0.0241	0.0729	0.124
	(-1.28)	-0.07	-0.32	-0.27	-0.8	-1.37
1960-1969	-0.0441	0.0754	0.0758	0.0243	0.0761	0.147
	(-0.86)	-1.45	-1.46	-0.28	-0.87	-1.68
1970-1979	-0.198***	-0.0238	-0.0331	0.0205	0.0801	0.15
	(-3.78)	(-0.45)	(-0.62)	-0.2	-0.76	-1.43
Education (Ref Medium)						
Primary		0.429***	0.260***		0.358***	0.231*
		-9.79	-5.77		-3.34	-2.14
Tertiary		-0.495***	0.0419		-0.299***	0.0545
		(-11.50)	-0.83		(-4.43)	-0.76
Currently studying (Ref.No)			-1.114***			-1.268***
			(-18.69)			(-12.00)
Observations	22187	22187	22187	9271	9271	9271

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – France and Hungary

	France			Hungary		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
14-18	-7.843***	-7.909***	-7.045***	-8.434***	-8.437***	-7.896***
	(-43.36)	(-43.15)	(-36.57)	(-50.47)	(-49.94)	(-44.76)
19-22	-5.767***	-5.815***	-5.392***	-6.180***	-6.161***	-5.855***
	(-27.73)	(-27.68)	(-26.22)	(-51.07)	(-49.98)	(-46.48)
23-26	-5.057***	-5.074***	-4.918***	-5.566***	-5.513***	-5.350***
	(-24.46)	(-24.28)	(-24.15)	(-46.81)	(-45.45)	(-43.85)
27-30	-4.914***	-4.917***	-4.877***	-5.547***	-5.492***	-5.414***
	(-23.75)	(-23.51)	(-23.92)	(-45.54)	(-44.16)	(-43.39)
30-35	-5.232***	-5.245***	-5.210***	-6.047***	-6.017***	-5.961***
	(-24.74)	(-24.53)	(-24.99)	(-42.76)	(-41.81)	(-41.37)
35 +	-7.280***	-7.305***	-7.250***	-7.283***	-7.267***	-7.223***
	(-32.45)	(-32.21)	(-32.74)	(-44.11)	(-43.15)	(-43.04)
Currently working (Ref. No)	0.353	0.35	0.27	-0.226**	-0.238**	-0.295***
	-1.78	-1.76	-1.4	(-2.66)	(-2.79)	(-3.45)
Cohorts (Ref. 1940-1949)						
1950-1959	-0.088	-0.0409	-0.0252	0.712***	0.775***	0.770***
	(-1.39)	(-0.64)	(-0.40)	-5.5	-5.97	-5.93
1960-1969	0.0437	0.155*	0.197**	1.513***	1.630***	1.637***
	-0.71	-2.46	-3.13	-10.57	-11.33	-11.37
1970-1979	-0.144*	0.0576	0.124	1.065***	1.215***	1.216***
	(-2.18)	-0.84	-1.8	-7.43	-8.4	-8.41
Education (Ref Medium)						
Primary		0.273***	0.164**		0.13	-0.014
		-5.07	-3.02		-1.78	(-0.19)
Tertiary		-0.365***	-0.114*		-0.454***	-0.193***
		(-7.02)	(-2.12)		(-8.63)	(-3.32)
Currently studying (Ref.No)			-1.185***			-0.662***
			(-15.13)			(-10.37)
Observations	19694	19694	19694	15950	15944	15944

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – Italy and Lithuania

	Italy			Lithuania		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
14-18	-7.410***	-7.653***	-7.159***	-7.555***	-7.561***	-6.741***
	(-117.52)	(-115.16)	(-103.47)	(-32.23)	(-31.79)	(-26.27)
19-22	-5.312***	-5.545***	-5.319***	-4.976***	-4.959***	-4.420***
	(-177.59)	(-151.31)	(-141.37)	(-25.63)	(-25.08)	(-21.27)
23-26	-4.566***	-4.771***	-4.641***	-4.359***	-4.299***	-4.028***
	(-161.69)	(-136.29)	(-132.61)	(-22.21)	(-21.49)	(-19.86)
27-30	-4.346***	-4.532***	-4.464***	-4.487***	-4.404***	-4.232***
	(-139.08)	(-121.50)	(-119.79)	(-21.25)	(-20.50)	(-19.55)
30-35	-4.436***	-4.627***	-4.573***	-5.445***	-5.357***	-5.219***
	(-119.36)	(-108.69)	(-107.34)	(-20.61)	(-20.02)	(-19.42)
35 +	-6.039***	-6.254***	-6.186***	-6.772***	-6.671***	-6.559***
	(-132.43)	(-124.77)	(-123.44)	(-23.89)	(-23.30)	(-22.83)
Currently working (Ref. No)	-0.262***	-0.247***	-0.325***	0.126	0.117	0.00576
	(-12.08)	(-11.33)	(-14.84)	-0.7	-0.64	-0.03
Cohorts (Ref. 1940-1949)						
1950-1959	0.0323	0.144***	0.132***	-0.0619	0.0197	-0.0504
	-1.09	-4.8	-4.4	(-0.63)	-0.2	(-0.50)
1960-1969	-0.273***	-0.126***	-0.129***	0.026	0.15	0.0833
	(-9.34)	(-4.21)	(-4.30)	-0.26	-1.46	-0.81
1970-1979	-0.630***	-0.418***	-0.418***	-0.065	0.0975	0.0736
	(-19.56)	(-12.49)	(-12.49)	(-0.62)	-0.91	-0.68
Education (Ref Medium)						
Primary		0.324***	0.234***		0.198*	0.026
		-13.33	-9.5		-2.11	-0.27
Tertiary		-0.402***	-0.0851*		-0.494***	-0.233*
		(-12.06)	(-2.44)		(-5.79)	(-2.56)
Currently studying (Ref.No)			-1.212***			-0.812***
			(-22.16)			(-7.98)
Observations	70316	70316	70316	6233	6233	6233

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the first child – the Czech Republic and Georgia

	The Czech Republic			Georgia		
Duration splines	Modello 1	Modello 2	Modello 3	Modello 1	Modello 2	Modello 3
14-18	-6.996***	-6.996***	-6.357***	-7.242***	-7.195***	-6.064***
	(-23.49)	(-23.50)	(-20.82)	(-30.39)	(-30.14)	(-24.64)
19-22	-4.538***	-4.523***	-4.425***	-5.224***	-5.148***	-4.548***
	(-15.69)	(-15.57)	(-15.26)	(-22.35)	(-21.87)	(-19.20)
23-26	-4.287***	-4.241***	-4.277***	-5.094***	-4.964***	-4.640***
	(-14.63)	(-14.40)	(-14.52)	(-21.67)	(-20.96)	(-19.56)
27-30	-4.563***	-4.508***	-4.602***	-5.314***	-5.169***	-4.986***
	(-15.21)	(-14.97)	(-15.24)	(-22.28)	(-21.51)	(-20.74)
30-35	-5.021***	-4.980***	-5.081***	-5.610***	-5.474***	-5.311***
	(-15.75)	(-15.56)	(-15.85)	(-22.86)	(-22.17)	(-21.50)
35 +	-6.673***	-6.680***	-6.755***	-6.860***	-6.736***	-6.587***
	(-19.30)	(-19.24)	(-19.45)	(-27.26)	(-26.60)	(-26.03)
Currently working (Ref. No)	0.0814	0.0814	0.125	0.542*	0.546*	0.325
	-0.29	-0.29	-0.44	-2.35	-2.36	-1.4
Cohorts (Ref. 1940-1949)						
1950-1959	-0.105	-0.0727	-0.0197	0.135*	0.169**	0.158**
	(-1.23)	(-0.85)	(-0.23)	-2.46	-3.06	-2.84
1960-1969	0.00746	0.0726	0.087	0.0816	0.143**	0.114*
	-0.08	-0.82	-0.98	-1.5	-2.58	-2.06
1970-1979	-0.360***	-0.298***	-0.299***	0.143*	0.269***	0.207***
	(-4.12)	(-3.36)	(-3.37)	-2.49	-4.64	-3.57
Education (Ref Medium)						
Primary		0.154	0.0396		0.314***	0.0806
		-1.65	-0.42		-4.52	-1.14
Tertiary		-0.495***	-0.0688		-0.561***	-0.200***
		(-5.45)	(-0.69)		(-13.08)	(-4.22)
Currently studying (Ref.No)			-1.096***			-1.013***
			(-8.91)			(-17.93)
Observations	6440	6440	6440	19317	19317	19317

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the second child – models for each country

Transition to the second child – Bulgaria and Germany

	Bulgaria				Germany			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-3.648***	-3.939***	-3.934***	-3.760***	-4.069***	-4.131***	-4.128***	-4.071***
	(-35.78)	(-35.82)	(-35.73)	(-33.99)	(-27.54)	(-27.30)	(-27.26)	(-26.59)
	-3.458***	-3.711***	-3.708***	-3.526***	-3.949***	-4.006***	-4.004***	-3.942***
	(-33.12)	(-33.36)	(-33.30)	(-31.50)	(-25.94)	(-25.79)	(-25.78)	(-25.18)
4-6	-3.628***	-3.863***	-3.861***	-3.665***	-4.423***	-4.479***	-4.479***	-4.407***
	(-32.66)	(-32.99)	(-32.97)	(-31.05)	(-26.07)	(-25.98)	(-25.98)	(-25.39)
6-8	-4.290***	-4.515***	-4.515***	-4.311***	-4.856***	-4.910***	-4.912***	-4.841***
	(-33.64)	(-33.99)	(-33.99)	(-32.24)	(-24.91)	(-24.89)	(-24.89)	(-24.37)
8+	-6.021***	-6.250***	-6.252***	-6.063***	-6.882***	-6.935***	-6.939***	-6.908***
	(-47.85)	(-47.67)	(-47.68)	(-45.91)	(-34.02)	(-33.91)	(-33.91)	(-33.65)
Currently working (Ref. No)	-0.690***	-0.574***	-0.575***	-0.596***	-0.285*	-0.273*	-0.271*	-0.309*
	(-7.56)	(-6.23)	(-6.25)	(-6.47)	(-2.28)	(-2.18)	(-2.17)	(-2.47)
Cohorts (Ref. 1940-1949)								
1950-1959	0.114	0.203**	0.203**	0.188**	-0.0678	-0.0682	-0.0676	-0.000666
	-1.7	-3	-3	-2.78	(-0.63)	(-0.63)	(-0.62)	(-0.01)
1960-1969	-0.0385	0.126*	0.128*	0.0652	0.256*	0.267**	0.267**	0.293**
	(-0.65)	-2.08	-2.11	-1.07	-2.52	-2.61	-2.61	-2.84
1970-1979	-0.338***	-0.206**	-0.206**	-0.321***	0.323**	0.334**	0.332**	0.305*
	(-5.30)	(-3.19)	(-3.19)	(-4.94)	-2.64	-2.73	-2.72	-2.49
Education (Ref Medium)								
Primary		0.481***	0.479***	0.436***		0.252*	0.250*	0.219
		-9.55	-9.48	-8.6		-2.1	-2.08	-1.8
Tertiary		-0.322***	-0.304***	-0.172**		0.0653	0.0736	0.144
		(-5.78)	(-5.11)	(-2.83)		-0.81	-0.9	-1.7
Currently studying (Ref.No)			-0.0729	-0.213*			-0.0968	-0.18
			(-0.82)	(-2.38)			(-0.61)	(-1.10)
Age at first childbirth (Ref. <25)								
25-30				-0.503***				0.0475
				(-7.23)				-0.59
30-35				-1.005***				-0.226
				(-6.17)				(-1.95)
35+				-2.355***				-1.129***
				(-5.25)				(-4.63)
Observations	12679	12679	12679	12679	3683	3683	3683	3683

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Transition to the second child – France and Hungary

	France				Hungary			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-3.749***	-3.852***	-3.858***	-3.547***	-6.418***	-6.487***	-6.483***	-6.186***
	(-22.71)	(-22.92)	(-22.95)	(-20.79)	(-24.29)	(-24.30)	(-24.27)	(-22.93)
2-4	-3.477***	-3.574***	-3.578***	-3.255***	-6.091***	-6.156***	-6.153***	-5.863***
	(-21.08)	(-21.31)	(-21.34)	(-19.11)	(-23.08)	(-23.10)	(-23.07)	(-21.78)
4-6	-3.989***	-4.083***	-4.086***	-3.740***	-6.531***	-6.592***	-6.589***	-6.304***
	(-23.08)	(-23.28)	(-23.30)	(-20.98)	(-24.25)	(-24.25)	(-24.23)	(-22.99)
6-8	-4.521***	-4.612***	-4.615***	-4.250***	-6.956***	-7.016***	-7.014***	-6.728***
	(-24.06)	(-24.24)	(-24.26)	(-22.03)	(-24.87)	(-24.86)	(-24.85)	(-23.64)
8+	-6.658***	-6.748***	-6.748***	-6.422***	-8.238***	-8.296***	-8.295***	-8.042***
	(-34.53)	(-34.55)	(-34.56)	(-32.61)	(-30.21)	(-30.12)	(-30.12)	(-29.04)
Currently working (Ref. No)	-0.397**	-0.409**	-0.410**	-0.540***	-0.574***	-0.574***	-0.575***	-0.505***
	(-2.58)	(-2.66)	(-2.66)	(-3.50)	(-5.73)	(-5.69)	(-5.70)	(-4.80)
Cohorts (Ref. 1940-1949)								
1950-1959	-0.115	-0.105	-0.106	-0.0743	1.867***	1.862***	1.863***	1.748***
	(-1.58)	(-1.43)	(-1.44)	(-1.01)	-6.87	-6.83	-6.84	-6.4
1960-1969	0.0407	0.0548	0.0517	0.114	2.679***	2.669***	2.671***	2.424***
	-0.58	-0.76	-0.72	-1.57	-9.72	-9.67	-9.68	-8.67
1970-1979	0.237**	0.244**	0.245**	0.230**	2.542***	2.543***	2.545***	2.272***
	-3.09	-3.08	-3.09	-2.89	-9.18	-9.18	-9.19	-8.09
Education (Ref Medium)								
Primary		0.158*	0.162**	0.106		0.109	0.105	0.067
		-2.55	-2.61	-1.7		-1.21	-1.17	-0.74
Tertiary		0.194**	0.188**	0.329***		0.189**	0.196**	0.291***
		-3.26	-3.13	-5.34		-2.89	-2.85	-4.06
Currently studying (Ref.No)			0.0975	-0.0214			-0.0248	-0.116
			-1.03	(-0.22)			(-0.33)	(-1.50)
Age at first childbirth (Ref. <25)								
25-30				-0.349***				-0.222**
				(-6.08)				(-3.16)
30-35				-0.694***				-0.797***
				(-7.59)				(-4.95)
35+				-1.402***				-1.691***
				(-6.87)				(-3.75)
Observations	6747	6747	6747	6747	6965	6955	6955	6955

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Transition to the second child – Italy and Lithuania

	Italy				Lithuania			
	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
Duration splines								
0-2	-4.358***	-4.388***	-4.388***	-4.201***	-3.167***	-3.177***	-3.125***	-3.028***
	(-135.32)	(-106.01)	(-105.83)	(-96.48)	(-14.43)	(-14.08)	(-13.63)	(-13.16)
2-4.	-3.979***	-4.009***	-4.008***	-3.824***	-2.995***	-2.995***	-2.949***	-2.853***
	(-121.58)	(-95.74)	(-95.64)	(-86.84)	(-12.98)	(-12.69)	(-12.35)	(-11.93)
4-6.	-4.214***	-4.243***	-4.242***	-4.053***	-3.211***	-3.210***	-3.170***	-3.057***
	(-107.95)	(-90.16)	(-90.09)	(-82.56)	(-13.16)	(-12.89)	(-12.62)	(-12.14)
6-8.	-4.781***	-4.810***	-4.810***	-4.612***	-3.661***	-3.657***	-3.621***	-3.488***
	(-91.13)	(-81.92)	(-81.90)	(-76.22)	(-13.72)	(-13.46)	(-13.26)	(-12.72)
8+	-6.748***	-6.777***	-6.777***	-6.593***	-5.594***	-5.594***	-5.564***	-5.452***
	(-130.23)	(-116.53)	(-116.52)	(-109.81)	(-21.60)	(-21.17)	(-20.99)	(-20.50)
Currently working (Ref. No)								
	-0.341***	-0.342***	-0.342***	-0.301***	-1.314***	-1.280***	-1.305***	-1.244***
	(-13.14)	(-12.73)	(-12.72)	(-11.13)	(-6.34)	(-6.17)	(-6.26)	(-5.96)
Cohorts (Ref. 1940-1949)								
1950-1959	-0.0321	-0.0307	-0.0306	-0.0658	-0.021	0.0201	0.0124	0.0422
	(-0.92)	(-0.87)	(-0.87)	(-1.87)	(-0.18)	-0.17	-0.11	-0.36
1960-1969	-0.0166	-0.0128	-0.0129	0.00236	0.0709	0.137	0.129	0.0959
	(-0.48)	(-0.36)	(-0.36)	-0.07	-0.6	-1.13	-1.06	-0.79
1970-1979	0.103*	0.108**	0.108**	0.0782	-0.0903	-0.0159	-0.00764	-0.0853
	-2.57	-2.62	-2.61	-1.89	(-0.69)	(-0.12)	(-0.06)	(-0.64)
Education (Ref Medium)								
Primary		0.0318	0.0316	-0.0315		0.0623	0.0456	0.0293
		-1.06	-1.06	(-1.04)		-0.57	-0.41	-0.26
Tertiary		0.0802	0.0831	0.216***		-0.314**	-0.283**	-0.171
		-1.89	-1.9	-4.87		(-2.94)	(-2.59)	(-1.54)
Currently studying (Ref.No)								
			-0.0228	-0.177*			-0.176	-0.312*
			(-0.28)	(-2.20)			(-1.25)	(-2.17)
Age at first childbirth (Ref. <25)								
25-30				-0.212***				-0.353***
				(-7.23)				(-3.30)
30-35				-0.459***				-0.902***
				(-10.90)				(-3.51)
35+				-1.105***				-1.637**
				(-12.35)				(-3.25)
Observations	29308	29308	29308	29308	2987	2987	2987	2987

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Transition to the second child – the Czech Republic and Georgia

	The Czech Republic				Georgia			
	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
Duration splines								
0-2	-4.070***	-4.106***	-4.100***	-3.835***	-3.803***	-3.679***	-3.624***	-3.301***
	(-10.48)	(-10.54)	(-10.52)	(-9.83)	(-13.02)	(-12.53)	(-12.33)	(-11.21)
2-4.	-3.904***	-3.937***	-3.933***	-3.672***	-4.232***	-4.083***	-4.041***	-3.683***
	(-10.06)	(-10.12)	(-10.10)	(-9.40)	(-14.40)	(-13.83)	(-13.67)	(-12.42)
4-6.	-4.205***	-4.238***	-4.236***	-3.958***	-4.687***	-4.531***	-4.498***	-4.111***
	(-10.65)	(-10.70)	(-10.70)	(-9.95)	(-15.68)	(-15.09)	(-14.97)	(-13.62)
6-8.	-4.792***	-4.825***	-4.825***	-4.534***	-5.616***	-5.461***	-5.431***	-5.024***
	(-11.78)	(-11.83)	(-11.83)	(-11.08)	(-17.81)	(-17.27)	(-17.17)	(-15.80)
8+	-6.384***	-6.416***	-6.417***	-6.138***	-7.335***	-7.184***	-7.162***	-6.822***
	(-16.02)	(-16.07)	(-16.07)	(-15.31)	(-23.66)	(-23.11)	(-23.04)	(-21.85)
Currently working (Ref. No)								
	-0.317	-0.336	-0.333	-0.496	0.187	0.0979	0.0691	-0.0353
	(-0.83)	(-0.88)	(-0.88)	(-1.30)	-0.65	-0.34	-0.24	(-0.12)
Cohorts (Ref. 1940-1949)								
1950-1959	0.171	0.185	0.183	0.176	0.200**	0.220***	0.216***	0.167**
	-1.75	-1.89	-1.87	-1.8	-3.27	-3.57	-3.5	-2.7
1960-1969	0.207*	0.225*	0.223*	0.181	0.250***	0.288***	0.281***	0.206***
	-2.03	-2.2	-2.18	-1.77	-4.13	-4.68	-4.57	-3.33
1970-1979	0.0589	0.0813	0.0798	0.047	0.00684	0.0584	0.0589	-0.125
	-0.56	-0.76	-0.75	-0.44	-0.11	-0.9	-0.91	(-1.90)
Education (Ref Medium)								
Primary		0.262*	0.257*	0.237*		0.235**	0.217**	0.118
		-2.52	-2.47	-2.27		-3.16	-2.9	-1.56
Tertiary		0.0329	0.0577	0.264*		-0.331***	-0.278***	-0.126*
		-0.3	-0.52	-2.3		(-6.79)	(-5.53)	(-2.39)
Currently studying (Ref.No)								
			-0.16	-0.288			-0.275***	-0.496***
			(-0.89)	(-1.58)			(-3.70)	(-6.46)
Age at first childbirth (Ref. <25)								
25-30				-0.239*				-0.295***
				(-2.29)				(-5.24)
30-35				-1.045***				-0.919***
				(-4.33)				(-9.24)
35+				-2.242***				-1.816***
				(-3.86)				(-8.96)
Observations	3531	3531	3531	3531	7856	7856	7856	7856

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001"

Transition to the Third child – models for each country

Transition to the Third child – Bulgaria and Germany

	Bulgaria				Germany			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-5.799***	-7.068***	-7.072***	-6.515***	-5.650***	-5.721***	-5.722***	-5.270***
	(-22.72)	(-24.91)	(-24.90)	(-22.76)	(-20.06)	(-19.92)	(-19.94)	(-17.87)
2-4.	-5.978***	-7.172***	-7.175***	-6.603***	-5.694***	-5.764***	-5.765***	-5.321***
	(-23.11)	(-25.03)	(-25.03)	(-22.80)	(-19.91)	(-19.79)	(-19.81)	(-17.74)
4-6.	-6.800***	-7.956***	-7.958***	-7.385***	-6.100***	-6.170***	-6.173***	-5.725***
	(-23.88)	(-25.68)	(-25.67)	(-23.65)	(-20.17)	(-20.09)	(-20.10)	(-18.14)
6+	-8.467***	-9.657***	-9.659***	-9.125***	-7.738***	-7.809***	-7.816***	-7.465***
	(-32.24)	(-33.33)	(-33.33)	(-31.21)	(-26.99)	(-26.77)	(-26.79)	(-24.88)
Currently working (Ref. No)	-0.245	-0.318	-0.318	-0.339	0.0978	0.102	0.109	0.119
	(-1.09)	(-1.41)	(-1.41)	(-1.51)	-0.41	-0.43	-0.46	-0.5
Cohorts (Ref. 1940-1949)								
1950-1959	0.156	0.474**	0.474**	0.305	0.308	0.334	0.338	0.406*
	-0.96	-2.9	-2.89	-1.85	-1.64	-1.78	-1.79	-2.16
1960-1969	0.149	0.673***	0.672***	0.507***	0.476**	0.507**	0.517**	0.676***
	-1.01	-4.48	-4.47	-3.36	-2.64	-2.8	-2.85	-3.72
1970-1979	0.304	0.481**	0.481**	0.232	0.549*	0.531*	0.530*	0.453
	-1.82	-2.89	-2.89	-1.39	-2.34	-2.26	-2.25	-1.93
Education (Ref Medium)								
Primary		2.016***	2.019***	1.867***		0.342	0.348	0.228
		-14.66	-14.63	-13.41		-1.81	-1.83	-1.19
Tertiary		-0.341	-0.361	0.0562		0.0322	0.0482	0.253
		(-1.34)	(-1.36)	-0.2		-0.23	-0.34	-1.74
Currently studying (Ref.No)			0.124	-0.176			-0.383	-0.814*
			-0.28	(-0.39)			(-1.06)	(-2.20)
Age at second childbirth (Ref. <25)								
25-30				-1.202***				-0.448**
				(-7.16)				(-3.05)
30-35				-0.860**				-1.017***
				(-3.05)				(-5.55)
35+				-1.600*				-1.823***
				(-2.24)				(-4.86)
Observations	11126	11126	11126	11126	3066	3066	3066	3066
t statistics in parentheses								
* p<0.05	** p<0.01	*** p<0.001						

Transition to the Third child – France and Hungary

	France				Hungary			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-5.090***	-5.350***	-5.349***	-4.667***	-7.583***	-7.944***	-7.963***	-7.869***
	(-26.11)	(-26.15)	(-26.12)	(-22.00)	(-7.54)	(-7.88)	(-7.89)	(-7.57)
2-4.	-4.834***	-5.085***	-5.084***	-4.385***	-7.362***	-7.685***	-7.702***	-7.612***
	(-25.13)	(-25.22)	(-25.20)	(-20.90)	(-7.32)	(-7.63)	(-7.64)	(-7.33)
4-6.	-5.477***	-5.719***	-5.719***	-5.007***	-7.863***	-8.169***	-8.184***	-8.096***
	(-26.68)	(-26.77)	(-26.75)	(-22.63)	(-7.78)	(-8.07)	(-8.09)	(-7.78)
6+	-7.135***	-7.388***	-7.387***	-6.719***	-8.743***	-9.040***	-9.040***	-8.966***
	(-37.09)	(-36.76)	(-36.76)	(-32.21)	(-8.71)	(-8.99)	(-8.99)	(-8.68)
Currently working (Ref. No)	0.0367	0.0224	0.0223	-0.117	-0.399*	-0.288	-0.29	-0.296
	-0.22	-0.13	-0.13	(-0.68)	(-2.22)	(-1.59)	(-1.60)	(-1.63)
Cohorts (Ref. 1940-1949)								
1950-1959	-0.0928	-0.0216	-0.0212	0.0235	1.773	1.78	1.767	1.862
	(-0.86)	(-0.20)	(-0.20)	-0.22	-1.75	-1.75	-1.74	-1.8
1960-1969	-0.0108	0.108	0.109	0.263*	2.265*	2.344*	2.328*	2.416*
	(-0.10)	-1	-1.01	-2.43	-2.24	-2.32	-2.3	-2.33
1970-1979	0.113	0.264*	0.265*	0.278*	2.853**	2.806**	2.796**	2.856**
	-0.89	-2.04	-2.05	-2.15	-2.82	-2.77	-2.76	-2.75
Education (Ref Medium)								
Primary		0.534***	0.533***	0.363***		1.167***	1.193***	1.142***
		-5.85	-5.83	-3.9		-9.06	-9.13	-8.65
Tertiary		0.0251	0.0257	0.327**		-0.0385	-0.0853	-0.0145
		-0.25	-0.25	-3.11		(-0.28)	(-0.61)	(-0.10)
Currently studying (Ref.No)			-0.0196	-0.165			0.208	0.18
			(-0.11)	(-0.92)			-1.32	-1.13
Age at second childbirth (Ref. <25)								
25-30				-0.716***				-0.333**
				(-7.90)				(-2.66)
30-35				-1.284***				-0.129
				(-9.89)				(-0.75)
35+				-1.802***				-0.0104
				(-7.06)				(-0.03)
Observations	6241	6241	6241	6241	5458	5455	5455	5455

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the Third child – Italy and Lithuania

	Italy				Lithuania			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-5.353***	-5.728***	-5.740***	-4.963***	-5.282***	-5.223***	-5.228***	-4.343***
	(-90.32)	(-69.85)	(-69.85)	(-55.70)	(-16.98)	(-16.40)	(-16.41)	(-12.91)
2-4.	-5.337***	-5.713***	-5.723***	-4.941***	-5.561***	-5.504***	-5.508***	-4.612***
	(-86.27)	(-68.02)	(-68.05)	(-54.11)	(-17.35)	(-16.74)	(-16.75)	(-13.27)
4-6.	-5.592***	-5.968***	-5.977***	-5.192***	-5.675***	-5.622***	-5.624***	-4.712***
	(-80.06)	(-66.25)	(-66.29)	(-53.41)	(-17.24)	(-16.65)	(-16.66)	(-13.17)
6+	-7.307***	-7.686***	-7.688***	-6.950***	-7.473***	-7.421***	-7.416***	-6.569***
	(-124.58)	(-93.63)	(-93.63)	(-77.34)	(-24.71)	(-23.83)	(-23.80)	(-19.84)
Currently working (Ref. No)	-0.504***	-0.429***	-0.425***	-0.335***	-0.339	-0.404	-0.42	-0.509*
	(-9.60)	(-7.80)	(-7.74)	(-6.10)	(-1.34)	(-1.58)	(-1.64)	(-1.99)
Cohorts (Ref. 1940-1949)								
1950-1959	-0.095	-0.0529	-0.0503	-0.122*	-0.0806	0.0139	0.0202	-0.151
	(-1.55)	(-0.86)	(-0.81)	(-1.98)	(-0.36)	-0.06	-0.09	(-0.66)
1960-1969	-0.0699	0.0213	0.0232	0.0689	0.323	0.441*	0.442*	0.134
	(-1.08)	-0.32	-0.35	-1.05	-1.48	-1.97	-1.97	-0.58
1970-1979	0.131	0.226**	0.235**	0.16	0.374	0.393	0.382	-0.0218
	-1.54	-2.63	-2.73	-1.87	-1.43	-1.5	-1.45	(-0.08)
Education (Ref Medium)								
Primary		0.423***	0.423***	0.209***		0.216	0.226	0.087
		-6.78	-6.78	-3.31		-1.1	-1.15	-0.44
Tertiary		0.273**	0.235*	0.521***		-0.607*	-0.620*	-0.261
		-2.86	-2.43	-5.31		(-2.49)	(-2.53)	(-1.05)
Currently studying (Ref.No)			0.453**	0.138			0.212	-0.129
			-2.84	-0.86			-0.66	(-0.40)
Age at second childbirth (Ref. <25)								
25-30				-0.667***				-0.770***
				(-12.24)				(-4.29)
30-35				-1.309***				-1.874***
				(-17.15)				(-5.19)
35+				-1.689***				-2.707**
				(-12.83)				(-2.68)
Observations	23650	23650	23650	23650	2370	2370	2370	2370

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Transition to the Third child – the Czech Republic and Georgia

	The Czech Reublic				Georgia			
Duration splines	Modello 1	Modello 2	Modello 3	Modello 4	Modello 1	Modello 2	Modello 3	Modello 4
0-2	-5.851*** (-8.01)	-5.957*** (-8.16)	-5.973*** (-8.18)	-5.248*** (-7.12)	-4.908*** (-17.43)	-4.849*** (-17.10)	-4.856*** (-17.12)	-4.347*** (-15.11)
2-4.	-6.503*** (-8.80)	-6.597*** (-8.92)	-6.605*** (-8.93)	-5.890*** (-7.89)	-5.169*** (-18.25)	-5.089*** (-17.84)	-5.092*** (-17.85)	-4.578*** (-15.82)
4-6.	-6.761*** (-9.07)	-6.854*** (-9.19)	-6.859*** (-9.19)	-6.152*** (-8.17)	-5.643*** (-19.56)	-5.555*** (-19.14)	-5.557*** (-19.14)	-5.040*** (-17.12)
6+	-8.054*** (-11.17)	-8.157*** (-11.31)	-8.153*** (-11.31)	-7.484*** (-10.31)	-7.330*** (-26.25)	-7.245*** (-25.81)	-7.243*** (-25.81)	-6.770*** (-23.85)
Currently working (Ref. No)	0.251 -0.35	0.209 -0.29	0.196 -0.27	-0.0267 (-0.04)	0.0602 -0.22	-0.0338 (-0.13)	-0.0376 (-0.14)	-0.202 (-0.74)
Cohorts (Ref. 1940-1949)								
1950-1959	0.0528 -0.27	0.0758 -0.39	0.082 -0.42	0.0752 -0.38	0.0196 -0.22	0.0765 -0.84	0.078 -0.86	-0.0298 (-0.33)
1960-1969	0.351 -1.75	0.477* -2.36	0.477* -2.36	0.352 -1.74	-0.009 (-0.10)	0.0531 -0.57	0.0555 -0.6	-0.0729 (-0.78)
1970-1979	0.246 -1.01	0.332 -1.36	0.314 -1.28	0.274 -1.12	-0.315** (-2.85)	-0.242* (-2.19)	-0.240* (-2.16)	-0.451*** (-4.03)
Education (Ref Medium)								
Primary		0.744*** -4.24	0.764*** -4.34	0.582** -3.28		0.640*** -6.67	0.646*** -6.72	0.541*** -5.59
Tertiary		-0.516 (-1.82)	-0.611* (-2.11)	-0.268 (-0.89)		-0.462*** (-5.19)	-0.475*** (-5.28)	-0.249** (-2.67)
Currently studying (Ref.No)			0.727 -1.93	0.357 -0.93			0.194 -1.11	-0.0581 (-0.33)
Age at second childbirth (Ref. <25)								
25-30				-0.848*** (-4.74)				-0.505*** (-6.38)
30-35				-1.405*** (-4.02)				-0.940*** (-6.41)
35+				-0.922 (-1.55)				-1.653*** (-5.16)
Observations	3430	3430	3430	3430	9992	9992	9992	9992

t statistics in parentheses
* p<0.05 ** p<0.01 *** p<0.001

Appendix V: Estimates from both the independent hazard model (separately for each parity transition) and the simultaneous equations model

These tables can be found in Impicciatore, R., Dalla Zuanna, G. (2016), The impact of education on fertility in Italy. Changes across cohorts and south–north differences, *Quality & Quantity*, 51(5), 2293-2317

The authors observe that the endogeneity in the relationship with education and fertility does not emerge as a relevant characteristic (Impicciatore, Dalla Zuanna, 2016). In fact, they suggest that "the development of simultaneous equations in order to account for unobserved variables that may simultaneously affect both fertility tempo and fertility quantum, modify the magnitude but not the sign of coefficients obtained using independent equations […] other factors arise as more relevant than the control for selection through joint modelling" (p. 2312).
Furthermore, in this paper the authors observe that "the standard deviation of the common residual in the three fertility equations is significantly different from zero (0.92), suggesting the presence of a certain level of selectivity with regard to individual characteristics in the second and third birth order. Failing to take selectivity into account would lead to an overestimation of the positive relation between fertility and higher education in the second and third child birth. In our model we also consider the potential effect of common unobserved factors on both fertility and education. The correlation among residuals is negative (-0.06) but close to zero and not supported by an adequate significance level" (p. 2308).

	First child				*Second child*				*Third child*			
	Indep.		Simult.		Indep.		Simult.		Indep.		Simult.	
	Beta	Sign.	Beta	Sign.	Beta	Sign.	Beta	Sign.	Beta	Sign.	Beta	Sign.
Education (Ref. Medium)												
Low	0.25	***	0.45	***	-0.11	***	-0.04		0.04		0.11	
High	0.07	*	-0.12	**	0.25	***	0.22	***	0.45	***	0.36	***

*Standard deviation of residual in the fertility equations: 0.92****

Correlation between the residuals (fertility-education) in the simultaneous models: -0.06

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