The effect of women's participation in labour market on postponement of childbearing: a comparison between Italy and Hungary

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Abstract

This paper analyses the effect of the increasing female participation in the labour market on the transition to first childbirth. In this analysis both the generational and the regional perspective are taken into account to understand, how postponement behaviour is spreading from one region to the other and from one generation to the next. The analysis is based on the first wave of the Generations and Gender Survey of Italy and Hungary. It adopts a multilevel event history model to focus on the micro-level relationship between the transition to adulthood and reproductive behaviour, to understand the empirical importance of macro-level factors related to regional socio-economic and cultural differences and to indicate differences in micro-level relationships among people of different family, socio-economic, and educational backgrounds. The results of the model shows that the delayed entry into labour market has a significant negative effect on the probability of having a child. This effect remains significant also controlling for generations, regional heterogeneity and increasing of female participation.

Keywords: low fertility, postponement, first job, discrete time, multilevel event history analysis models

1. INTRODUCTION

Sustained below-replacement fertility levels remain the focus of scientific debate in developed countries, with Europe leading the trend towards low and very low fertility. Kohler et al. (2006) believe that, in the coming decades, very low fertility will likely become an issue in a number of developing countries. In order to emphasize the dramatic implications of low, potentially long-lasting, levels of fertility, Kohler et al. (2002) labelled these countries as "lowest-low fertility" countries. Despite large political, socio-economic and cultural differences, many Central-Eastern and Mediterranean European countries face similar levels of lowest-low fertility. This has been somewhat of an unexpected realization that has since caught, the interest of a number of scholars (among others Kohler et al. 2002; Billari and Kohler 2004; Frejka 2008; Sobotka 2004; Coleman 2006). Rejecting the hypothesis of the existence of one overall explanation for the spread of lowest-low fertility, most studies have focused on the postponement of childbearing (Kohler et al. 2002; Sobotka 2004; Lestaeghe 2002).

While these studies discuss a large number and often complex range of factors that may be contribute to lowest-low fertility levels, they generally agree that education, conflicting demands between work and motherhood, high unemployment rates, increasing percentage of temporary contracts, and the current uncertainty with regard to income play an important role in delaying the transition to adulthood and postponing childbearing.

Given that the cultural and socio-economic characteristics of lowest-low fertility countries vary considerably among countries, but also within a single country, identifying one set of factors responsible for the observed decline in fertility that is common to all countries, is difficult and constructing a holistic fertility theory even more so. However, there are some characteristics we can highlight. In all the countries of Southern Europe, young adults delay leaving the parental home; cohabitation and divorce are infrequent; extramarital birth rate is low; a relatively low percentage of women are employed; and there is a marked postponement of first motherhood, with a limited recovery of fertility at a more advanced age. In contrast, the countries of Central and Eastern Europe are all characterized by low postponement (i.e., people's age at completing their basic education, at forming their first union, and at achieving independence is within average limits) and greater numbers of extramarital births and rates of divorces than the European average.

The characteristics in fertility behaviour among Southern European countries and among Central-Eastern European countries raise many questions: Does the regional context play a role in delaying the postponement of fertility or does it bring it forward? Does the participation of female to the labour market influences the postponement of fertility? Are differences among individuals of different family, socio-economic, and educational backgrounds relevant? And, most of all, are Mediterranean and Central-Eastern European countries destined to experience a long lasting low fertility rate? Or has their fertility decline come to an end?

The aim of the present work is to assess how contextual factors affect individuals' reproductive behaviour. Specifically, we investigate the effects of female participation to the labour market on their transition to first childbirth. Our analysis focuses on the regional context, i.e. how postponement behaviour is spreading from one region to the other, and whether changes observed in the past are likely to continue in the future and, if so, to what extent.

We concentrate on Italy and Hungary since they are characteristic of the current trends observed in Southern and Central-Eastern European countries: Italy is the first country to have reached very low levels of fertility (TFR < 1.2 child per woman); while Hungary is the first

European country (since World War II) where fertility has dropped below the replacement level, and one of Central and Eastern Europe countries with the lowest fertility.

We argue that the differences in women's reproductive behaviour observed in countries, are related to both individual characteristics and regional ones. In order to explore the decisional process associated with fertility, we took into account the different levels (e.g. individual, household, regions) that influence an individual's decision. To this end, we adopted a multilevel analysis strategy (Hox 1995; Goldstein 2003; Steele 2008). The analysis was conducted through discrete-time multilevel event history models which enabled us to assess the effect of changes at both the individual and regional levels simultaneously. The use of this model, allowed us to analyse how regional differences affect reproductive behaviour with time and to distinguish between the impacts of individual attributes and the effect of the regional area in which the individual is located (Teachman and Crowder 2002).

The paper is structured as follows. First, we discuss the issue of very low fertility and we analyse the most important theories relating to that. Secondly, we present an overview of the main literature regarding the applicability of Second Demographic Transition and lowest-low fertility theory to Central and Eastern European countries. In particular, we focus on the role of the labour market and on the effect of the delay of women entrance into the labour market. Third, we introduce data from the *Hungarian* and *the Italian Generation and Gender Survey*. Fourth, we present the results of a descriptive analysis comparing the effects of cohort versus regional effects. Finally, we carried out an empirical analysis by implementing a discrete-time multilevel logistic model, emphasizing the effects of individual and regional characteristics.

2. THEORETICAL BACKGROUND

In Europe, changes in family behaviours are usually associated with the emergence of new lifestyles and living arrangements and with the changes of ideals and values to post-materialism ones. This theory, often referred to as the Second Demographic Transition (Van de Kaa 1987), proves to be a useful framework to explain the differences in the spread of new demographic behaviours (i.e. postponement of union formation and childbearing, delayed leaving of parental home, cohabitation replacing marriage, out-of-wedlock childbearing and increasing of divorce rates) across European countries but fails to explain the spread of long lasting low fertility. For example, the Second Demographic Transition theory has had limited success at explaining the demographic changes observed in Central-Eastern European countries. In the 1980's, an increasing number of couples living together out-side of marriage and a greater number of divorces and extramarital births confirmed the spread of post-materialist behaviours in Central-Eastern Europe and in the Republics of the former Soviet Union (Sobotka et al. 2003, Lesthaeghe and Surkyn 2002, Coleman 2004). At first glance, these trends suggested that the theory of the Second Demographic Transition may be applied in the former-Communist countries. However, it is hard to reconcile how the spread of post-materialist values (normally regarded as a consequence of the spread of economic and material prosperity) could have developed in a situation of economic recession, high unemployment, and political insecurity emblematic of the post-communist period.

At this regards some authors maintain that elevated levels of certainty and security with regard to the crucial events of life (e.g. guaranteed access to education and employment; Philipov 2003) proper of the Communist period may have been conducive to the spread of post-materialist values in the Eastern European countries (Kyveldis 2001).

The theory of lowest-low fertility concentrate on the spread of long lasting fertility below 1.3 child per woman, emphasizing the importance of the postponement of first maternity across cohorts (Kohler et al. 2002). This very low level of fertility, first recorded in Spain and Italy back in the early 1990s, is now a common demographic feature of a growing number of Central and Eastern European countries.

In their 2004 paper, Billari and Kohler outlines the causes, implications, and the potential political responses to the reduced fertility, arguing that the spreading of a systematic pattern of very low fertility is characterized by postponement of motherhood to an advanced age, a low probability of having a second child, and a progressive and gradual postponement of fertility from one generation to another. In the authors' opinion, lowest-low fertility is caused by a combination of the following demographic and socioeconomic factors:

- lack of socioeconomic incentives and delayed motherhood/fatherhood, which makes the postponement of parenthood a reasonable response to young people's considerable economic uncertainty, the insecurity of the labour market, and other similar factors;
- social conditioning of the age of parenthood, with the result that the desire for it has to adapt to socioeconomic changes, postponing the transition to adulthood;
- a rigid labour market together with the lack of services for children, and the prevalence of traditional gender roles are institutional features that support the general diffusion of low fertility rate and transform what may be a merely temporary postponement into a radical renunciation of future motherhood.

Lowest-low fertility would thus appear to be the result of an interaction between demographic and behavioural factors that individually lead to a reduced fertility and collectively interact and reinforce the effect. In this context, the proportion of women opting not to have children is not a driving force considering that the postponement could be compensated by late fertility. However, studies on Italian women, found that postponement was not always followed by compensation and that postponement often turned into total renunciation (Livi Bacci and Salvini 2000; Ongaro 2002).

Within the research community, there is a widespread agreement that early adulthood years are characterized by multiple transitions (in education, work, residential and family spheres), which overlap in time, which are increasingly delayed and varied in their order (e.g. Cook and Furstenberg 2002; Elzinga and Liefbroer 2007; Mouw 2005; Settersten 2007; Shanahan 2000) and that these postponement processes are linked to very low levels of fertility observed (Bongaarts and Feeney 1998).

The timing and level of education occupy an ever more important part of the young adulthood: the percentage of young people enrolled in education as well as the mean number of years in the educational system has increased (Mejer et al. 2011). Meanwhile education has become increasingly important for family and fertility behaviour, since it is difficult to reconcile the status of student with that of mother and breadwinner. There is evidence that, a younger age at graduation leads to an earlier start of adult transitions, including parenthood, whereas, an older age in any given grade or level of school leads to a postponement of childbearing. The increase of female educational achievement has also contributed to the change of women's preference in the labour market, resulting in the further postponement of childbearing (Rindfuss and Brauner-Otto 2008).

Indeed the first entry into the labour market is a crucial phase in the transition to adulthood, that lay the foundations of become parents. This transition is affected by various overlapped and competing aspects related with the supply and demand of labour market (Breen 2005; Kerckhoff 1995; Müller 2005; Wolbers 2007). There is a general agreement that the shorter and smoother the transition from education to work is, the earlier the transition to parenthood will be. But empirical

research has shown that the relationship between women employment and childbearing is more complex, and probably related to country level factors that have not yet been measured (Rindfuss and Brauner-Otto, 2008). Labour markets are characterized by a high variability both at the regional and country levels in terms of the demand for new employees, protection of current employees and characteristics proper to the national labour market. Moreover, at country/regional level higher unemployment rates are linked to delayed fertility (Hoem 2000; King 2005; Liefbroer 2005; Noguera et al. 2005), whereas at individual level unemployed women are more likely to become mothers than their employed counterparts (Francesconi and Golsch 2005; Noguera et al. 2005).

The impact of female participation into labour market is best explain by the classical independence hypothesis which proposes that the decrease in fertility is due to an increase in female education and their greater participation to the labour market (Becker 1973 and 1981; Sweeney 2002). This hypothesis supposes the incompatibility between female employment and family roles. In the same line, the career entry hypothesis proposes that the increasing uncertainty and difficulty of access of the labour market make it difficult for young people to achieve economic and work stability (Oppenheimer 1988 and 1994; Billari 2008). In contrast, the ideational shift hypothesis focus on changes in value sets, underlining that an increase emphasis on individual autonomy, on the rejection of institutional controls in ones' life choices and on the spread of values related to the fulfilment of "higher order" needs, encourages individualization (Inglehard 1977; van de Kaa 1987; Lastehaeghe and Surkyn 1988; Surkyn and Lesthaeghe 2004).

Empirical research has shown that economic and cultural factors are both crucial in order to explain demographic changes and differences between countries. In this paper, we will examine the first two hypotheses since retrospective surveys do not permit the study of past attitudes and orientations. We further limit our attention to the transition to parenthood, i.e. the timing of the first birth because it is a crucial decision that strongly influences subsequent parities and the time-use patterns of women.

3. LOWEST-LOW FERTILITY: AN OVERVIEW OF THE SITUATION IN ITALY AN HUNGARY

3.1 Data

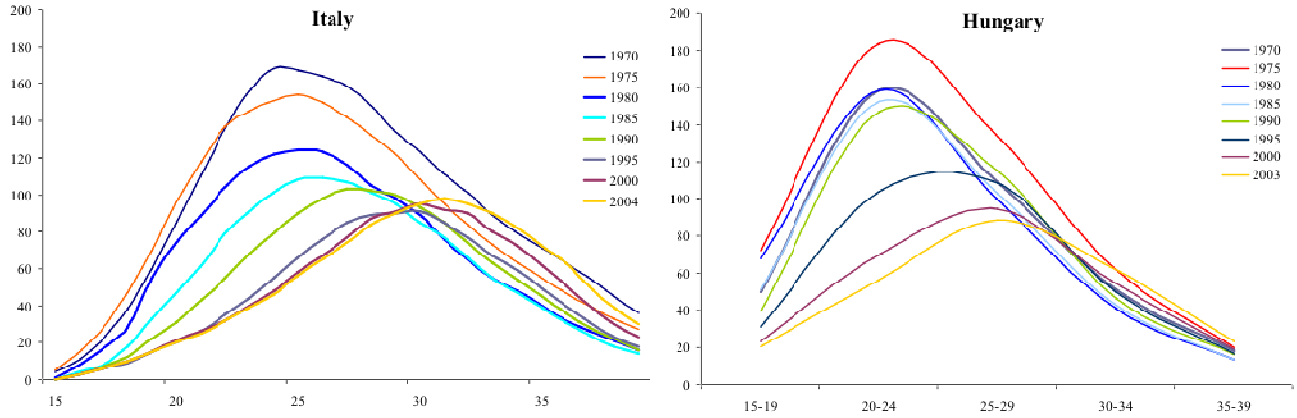
The data presented in this paper were collected as part of the first wave of the Generations and Gender Survey (GGS) carried out in Hungary and in Italy. For Hungary, we used the "Turning point of the life course" survey, carried out in late 2001 and early 2002 (Spéder 2001), whereas for Italy, we used the multi-purpose survey, "The family and social individuals", conducted in 2003. Both surveys were developed in the context of the Generations and Gender Programme. Each survey contains, for all individuals interviewed, a full history of union formation (single, married, cohabiting, etc.), of childbearing, and of family disruption (separation, divorce), as well as histories of education and employment. The presence of retrospective questions (both in the Hungarian GGS and in the Italian quasi-GGS) made it possible to reconstruct the main steps in the family history (pre-marital, professional, and reproductive training) of women belonging to several generations. Moreover the surveys allowed to take into account not only the different levels of society at which the determinants of demographic behaviour operate (micro, meso and macro) but also the evolution of behaviour from generation to generation.

3.2 Increasing mean age at childbirth

Many things have changed in Italy in the last few decades: the pattern of fertility, the role of women in society, their level of education, their position in the labour market, and the prevalent married couple model (Pinnelli and Di Giulio, 1999). These changes have affected the mean number of children per woman as well as the mean age of women at childbirth. The situation of Hungary does not appear so different. Total fertility rate in Italy and Hungary has been below replacement level for several decades and currently stands at a very low values (respectively 1.41 and 1.32 in 2009). At the same time, women's mean age at the birth of their first child, after a period of decline and then of stability, showed a substantial and continuous increase until the present-day level (in 2001 it was 28.8 for Italian women and 25.3 for Hungarian ones).

There is a widespread opinion among demographers that if the postponement trend continues, a substantial proportion of single women will never get married, giving up motherhood permanently (see among others De Sandre et al. 1997, Lesthaeghe and Willems 1999). An analysis of age-specific rates (Graph 1) shows that both a decrease in fertility (thus reducing the height and breadth of the curves) and a postponement of motherhood to a more advanced age (shifting of the curves towards a more advanced age). It can be clearly seen that in Italy since the 1980s and in Hungary since the mid-1990s there has been a gradual change in the modal value, which confirms the modification of social customs and norms concerning reproductive behaviour.

Graph 1 – Age-specific fertility rates of women in Italy and Hungary in 1970 -2003-04



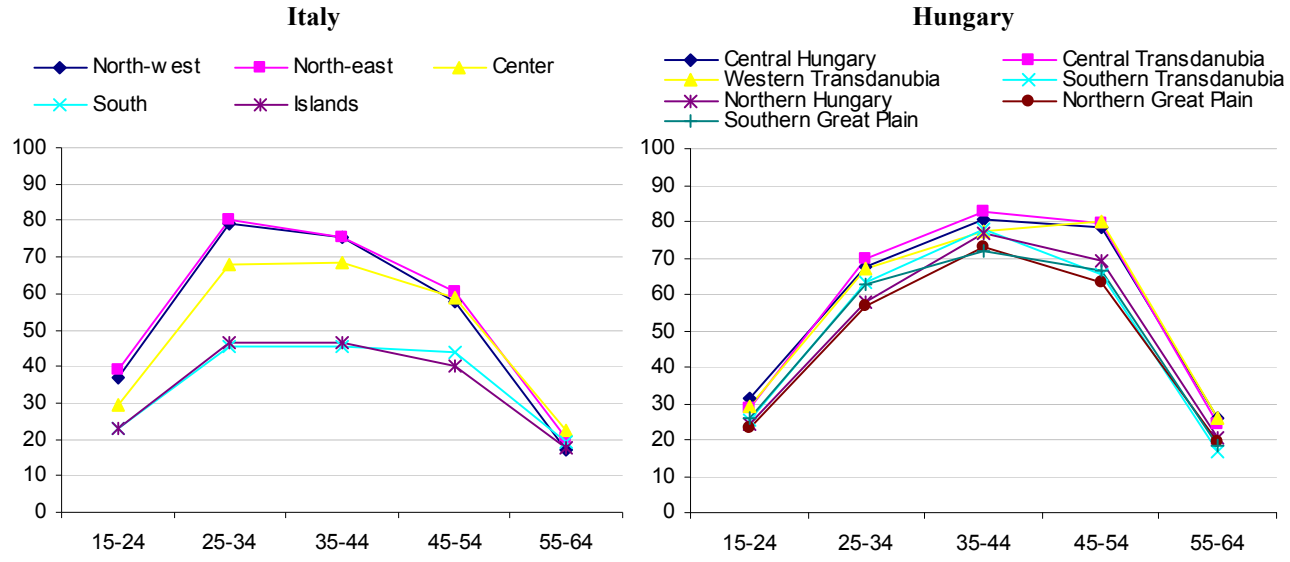
Source: Council of Europe 2003

3.3 Female participation in the labour market

The analysis of Hungarian and Italian labour market showed that the participation rate of women aged 15–64 years remained significantly below the EU average.

Minor differences were found with regard to the participation rates of Hungarian women in the age groups among 25–54 whereas considerable differences were evident in the two marginal age groups (15-24 and 55-64) (Figure 2). Young women (age group 15-24) participation rate was below 30% due to a greater number of them pursuing studies, due to the lack of employment prospects and due to the general lack of labour market opportunities. Due to the increase in the official retirement age, the participation rate of oldest age group (55–64 years) grew over 10% reaching around 20-25% in many regions.

Graph 2 –Female labour force participation rate by age (10-year age groups) in Italian and Hungarian regions (NUTS2) in 2003



Source: Eurostat 1995-2010

The labour market conditions in Italian regions is even worst. Despite recent institutional changes, the Italian system remains highly regulated, with strict rules for the hiring and firing of workers and for the different typology of employment contracts. Del Boca et al. (2002) maintain that "these labour market regulations have been largely responsible for the high unemployment rates of women and youth". Italian female labour market is characterized by low female participation rates among youth combined with the difficulties in re-entering the labour market after childbearing. Moreover, Southern Italy stands out with female participation rates to the labour market below 50% and extremely low levels of participation to the labour market for all age groups.

3.4 Effect of birth cohort

In both Italy and Hungary, generation had a very important effect on the age at which a woman has their first child. Since we were interested in studying the factors that led to changes in reproductive behaviour, we chose to focus exclusively on the generations that played a leading role in the postponement and decline of fertility.[1] In the case of Hungary, we believe that the generations born between 1967 and 1981 played a leading role in the changes in fertility observed: women born in 1967-71 (who started their fecund period in 1980-84) lived through years of profound demographic and social changes (Spéder 2005 and 2006), culminating in the great socio-political transformations of 1990. Consequently, we consider the female generation of 1967-81 as the first generation that have experienced Hungary's political and social transformation from a Socialist state to a western democracy.

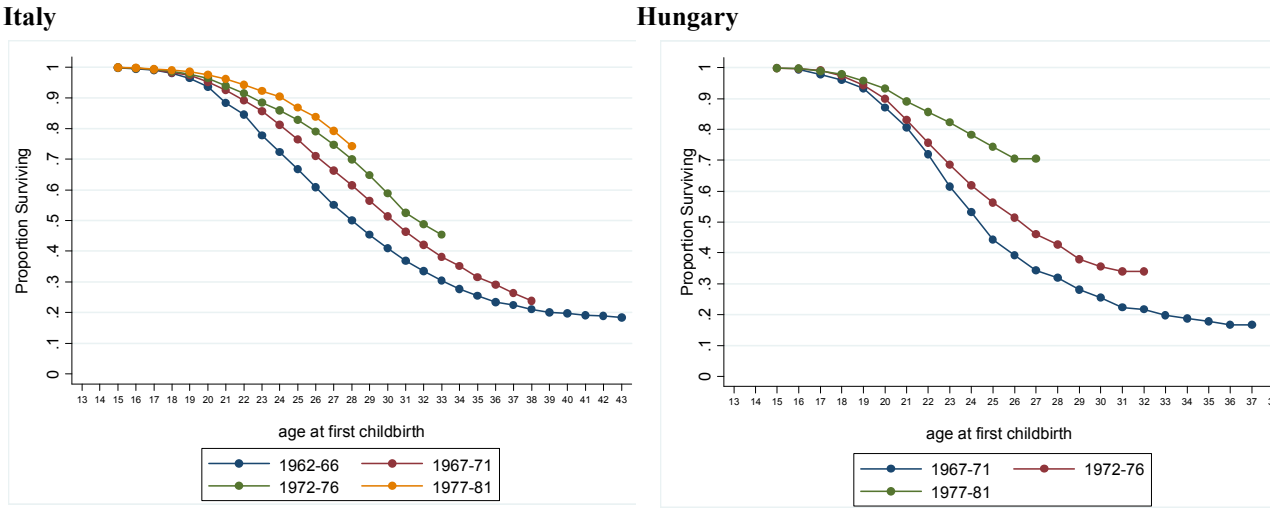
In Italy, similar considerations indicated that the generation born in 1962-66 was the first to experience major changes in fertility. De Sandre et al. (1997) maintain that the generation born in the early 1960s was the first to get married as a matter of choice (with a drop in the percentage of married women), postpone the birth of their first child and record lower fertility levels in all other birth orders. Indeed while women born in the 1950s went through an intermediate stage of transition (decline in the highest fertility rates and gradual lengthening of the intervals between

[1] The decision to include in the analysis only these generations had the effect of reducing the sample to 2,542 Hungarian women and 7,168 Italian women.

births), it was with women born in the 1960's that low fertility behaviours became established and widespread.

In both countries, the proportion of childless women by age (hence forward referred to as "proportion of survivors") in Italy and in Hungary changes over time, decreasing from one generation to the next (Graph 3). The choice of couples to postpone the fulfilment of parenthood eventually overlaps and interacts with a reduction in procreative capacity. The graphs show that in both countries the younger generation led the others in the considerable postponement of the birth of their first child, reaching a point, in the 1977-81 generation, when over 70-75% of women aged 25 years had not had their first child.

Graph 3 - Transition to the first birth by generation in Italy and in Hungary (*survival curve*)



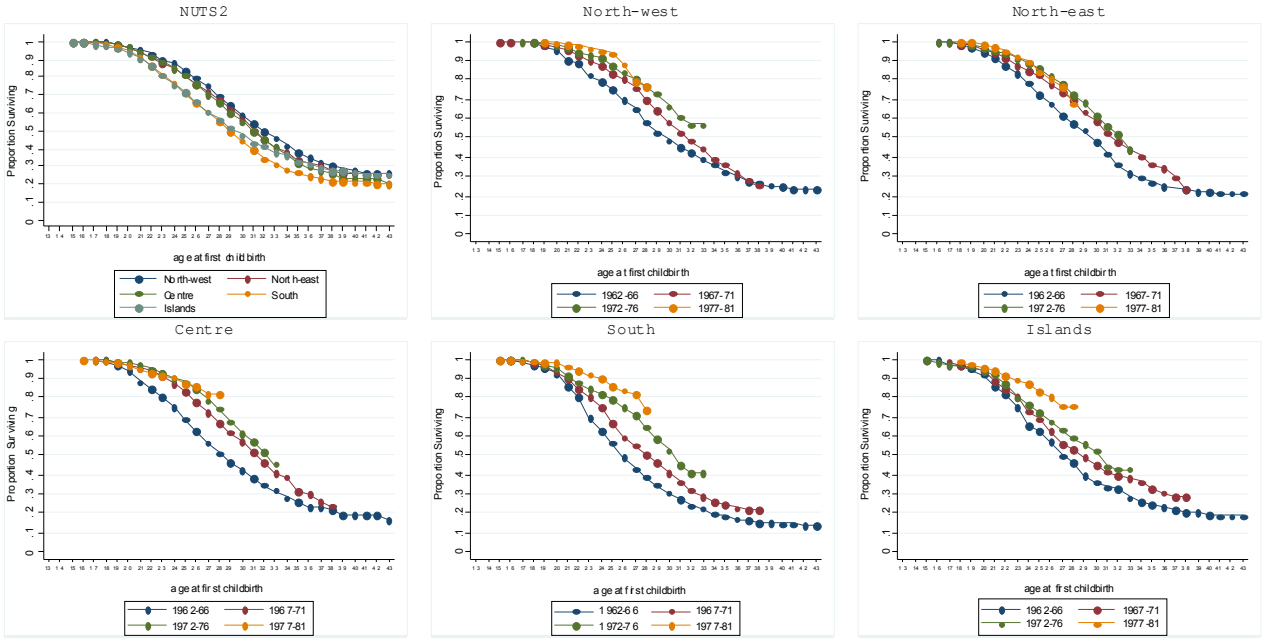
Source: (a) Istat, 2003 survey on "Family and Social Subjects";
(b) Hungarian Central Statistical Office - Demographic Research Institute, 2001-02 survey "Turning point of the life course".

3.5 Regional differences

From a regional point of view, the postponement of a woman's first child is evident in all regions. In Italy, the phenomenon appears to have started in the North to then spread rapidly towards the Centre and, one generation later, to the southern of the country. In Hungary, the central region recorded an intensive trend towards postponement of childbearing, while the north exhibited widespread, early reproductive behaviour.

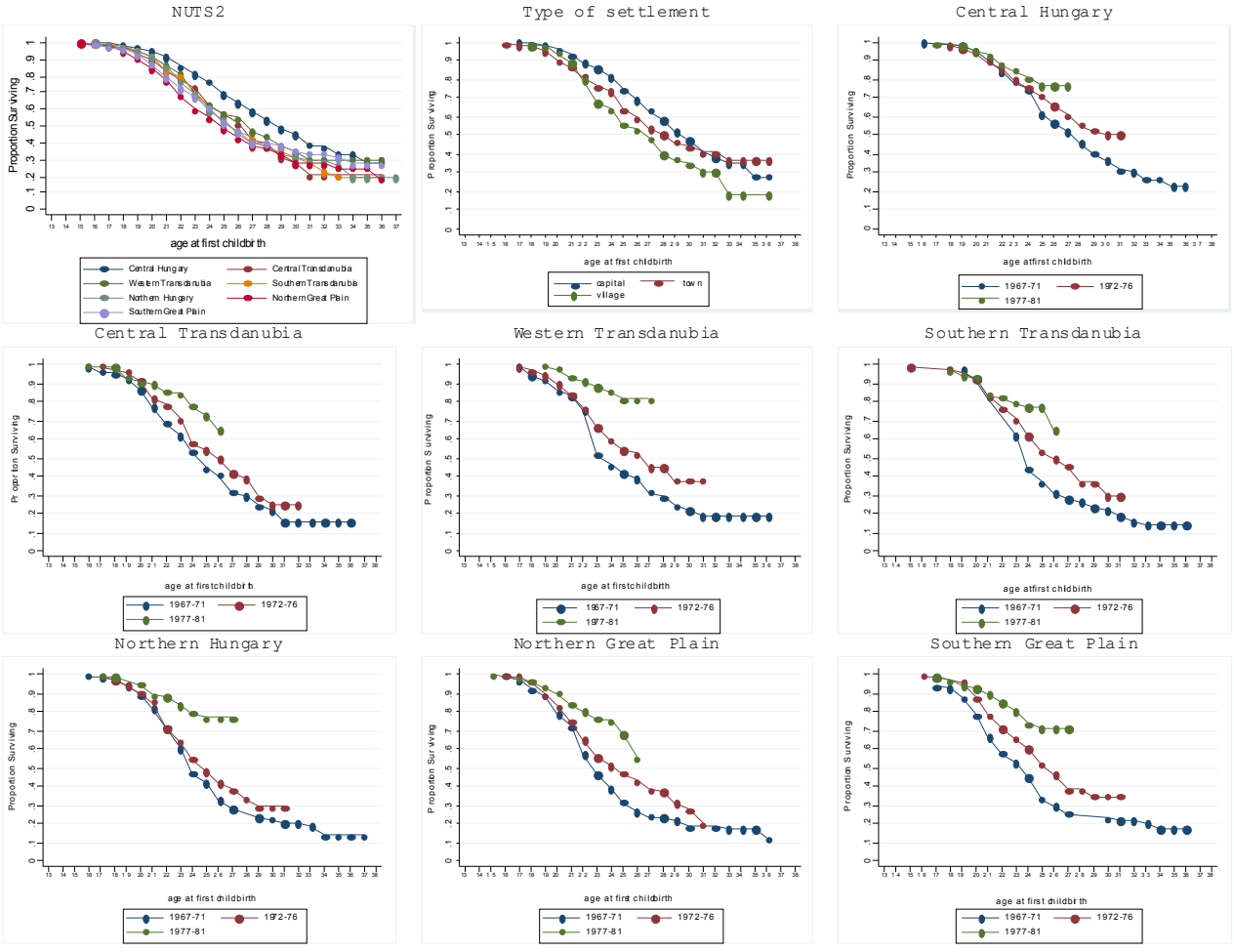
Clearly, both countries exhibited a considerable number of regional differences (see Graph 4 and 5). In Italy there was a big difference from region to region with regards to both the number of childless women (between 12% and 22%) and the fertility rate of women over 30 year-old. Women living in the South of Italy and in the Islands exhibited the highest levels of fertility postponement. This was particularly true for the 1977-1980 generation which showed the greatest slowdown in first childbirth. In Hungary there were notable differences among women living in different regional areas, but there were even more significant differences between cities of different sizes. In the capital and in large towns, the age of women at first childbearing was higher and the proportion of childless women over 30 years was greater than that of small towns, while in the small towns and especially in villages the mean age at marriage was lower and motherhood by the age of 30 was recorded in almost 90% of the population.

Graph 4 - Transition to the first birth by regions (NUT2), by generation in each region in Italy



Source: Istat, 2003 survey on "Family and Social Subjects"

Graph 5 - Transition to the first birth by regions (NUT2), by type of settlement, and by generation in each region in Hungary



Source: Hungarian Central Statistical Office - Demographic Research Institute, 2001-02 survey "Turning point of the life course".

4. METHODS

4.1. Preliminary considerations

We used a multilevel event history model to analyse the phenomenon of postponement of first birth. We selected this model to exploit the hierarchical structure of the data: individuals (first level) grouped within regional areas (second level). This approach allowed us to consider, jointly, the effect of individual and regional factors on woman reproductive behaviour.

A primary challenge in multilevel modelling is to distinguish between the impacts of individual or micro level attributes and the effect of the regional context (Teachman and Crowder 2002). Hazard models of individual-level data, are commonly used to show differences in micro-level relationships between people coming from different families, socio-economic contexts, and educational backgrounds (Blossfeld and Rohwer 2001).

The estimate for discrete-time event history models was obtained through logistic regression on a specially constructed data set (Roberts 2008). In order to reorganize the data as efficiently as possible (Allison 1984, Singer and Willett 1995; Yamaguchi 1991; Blossfeld and Rohwer 2001), women's age at the birth of their first child was considered the dependent variable. The probability of giving first-birth during time[2] *t* (given that there has been no birth before time *t*) was analysed as a function of their individual life histories (in terms of partnerships, home leaving, economic activity, education, …), taking into account the regional context and the historical context (generation). The time interval considered was fixed between 13 year-old and the age at first motherhood or the time of interview for childless women (for them the period of analysis is right censored). Women who failed to declare their date of birth or that of their first child, and those whose children were adopted were excluded from the analysis.

We focused our analysis on women's age at the birth of their first child, as opposed to the general age of motherhood, since the increase in age at subsequent births is largely a consequence of the postponement of the birth of the first child, rather than a change in time intervals between births. Reproductive behaviour was considered exclusively with reference to women,[3] because women's fertility can be assessed more easily and more reliably than that of men. To describe the changes in the reproductive behaviour of different birth cohorts, people were grouped in order to represent individuals formed during the same period with similar historical experiences and opportunities.[4] We model the probability of having the first child during time t using a discrete-time duration model (Allison 1984, Singer and Willett 1995; Yamaguchi 1991), which made it possible to estimate postponement of first motherhood, net of women's individual characteristics.

4.2. The discrete-time multilevel logit model

We applied a discrete-time event history model, in which the hazard rate was specified as a logistic regression function. This approach was chosen to focus on the micro-level relationship between transition to adulthood and reproductive behaviour, and to focus on the empirical relevance of macro-level factors related to regional differences in terms of the socio-economic and cultural context.

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[2] Note that time interval *t* is the woman's age ranging from 13 to 34 years in Hungary and from 13 to 41 years in Italy.

[3] Although the male component (husband, companion), with his life story, played an important and often crucial role in the woman's decisions regarding motherhood, it was not possible to study the interplay between the two biographies as information about the partner at the time the birth of the first child was available only in the Italian study.

[4] As Spéder pointed out (2006), this aspect is especially important to understand behavioral changes in a former Socialist State society like Hungary.

The discrete-time logit model made it possible to model the effects of women's life-course on their choices regarding motherhood, using event history analysis for discrete-time data (Yamaguchi 1991). To understand how regional differences influence individual behaviour in the course of time, we carried out the analysis using this model in a multilevel context. The first step of a discrete time model is to define a binary dependent variable for each time *t* (Steele, 2008). Given a dependent variable of the type

$$y_{ij(t)} \sim Binomial\left(1, h_{ij(t)}\right)$$

the multilevel logit model, which includes the covariates was:

$$\text{logit}\left(h_{ij(t)}\right) = \log \frac{h_{ij(t)}}{1 - h_{ij(t)}} = \alpha_t + \sum_{k=1}^{p} \beta_k x_{k,ij} + \sum_{l=1}^{m} \beta_l x_{l,ij(t)} + u_{oj}$$

$$u_{0j} \sim N\left(0, \sigma^2_{u0}\right)$$

where:

i	is the individual
j	is the region
t	is the woman's age, ranging from 13 to 34 years in Hungary and from 13 to 41 years in Italy
$h_{ij(t)}$	is the probability of experiencing the event in time interval t for individual i in the region j
$a(t)$	is the baseline hazard of experiencing the event as a function of time t
$x_{k,ij}$	k are the individual time-independent covariates associated with individual i in the region j (with k ranging from 1 to p)
$x_{l,ij(t)}$	are the l time-dependent individual covariates associated with individual i in region j at time t (with l ranging from 1 to m)
u_{0j}	is the second-level error, i.e. the random effect representing features not observed in region j

The response variable in this model was the duration until event occurrence, i.e. the duration between the beginning of fertile life and the birth of each woman's first child. Individuals grouped together within different regional contexts can therefore be classified in a two-level data structure in which regions represents the second level and duration in time from the beginning of fertility until first birth is included in the first level (with a person-years database). The hazard ($h_{(t)}$) expresses the probability that an unrepeatable event will occur during the time interval *t*, as opposed to time *t-1*. For the purpose of this paper, we define the time duration as the time interval between the beginning of the fecund period (defined as 13 year-old) and first motherhood. This method enables us to use a binary response model for variables within a multilevel context (Hox 2002). Since this is a discrete-time logit model, there is a 2nd-level, regional error (u_{0j}) associated with the model, but none at the individual level (cf. Hox 2002). This model was developed for the analysis of reproductive behaviour both of Hungarian and Italian women. The micro, meso and macro dimensions included in the model are described by the following variables.

Micro-dimension (individual-level variables):

▪ ***Age*** **–** Calculated from the difference between the month and year of the interview and the interviewee's year and month of birth.

▪ ***Regional Area*** **–** In order to take into account the regional variability of the behaviours considered in a multilevel context, the regional classification used for the second-level units was different for the two countries. For Hungary, we used a variable that considered both the type of settlement (classified as capital, city, town and village) and the region women lived in (Nuts 2). For Italy, we

used only regions (Nuts 3) because the survey does not allow to consider regional and municipal level simultaneously.

▪ ***Generation*** **–** To describe the changes in reproductive behaviour of the different birth cohorts, we grouped in five-year-age groups women born from 1947 to 1981. We considered generations of the same historical period, with similar experiences and opportunities, and took into account the fact that Hungary experienced rapid and profound social and historical transformations in its transition from Socialist state to free-market democracy. We, thus, classified women on the basis of their age at the start of societal transformation (year 1990), as proposed by Spéder in 2005 (see Scheme 1). To compare the information provided by the two surveys and describe the differences and similarities in the changes observed in reproductive behaviour for various cohorts, we also used the Spéder's classification to group Italian women.

Scheme 1 – Respondents' year of birth, age at interview, and age in 1990

Year of birth	Age at interview	Age in 1990 (year)
1947-51	50-54	39-43
1952-56	45-49	34-38
1957-61	40-44	29-33
1962-66	35-39	24-28
1967-71	30-34	19-23
1972-76	25-29	14-18
1977-81	20-24	9-13

Source: *Spéder 2005*

▪ ***Leaving parental home*** **–** In both surveys, the information regarding the time of leaving the parental home was not assessed exactly. For Hungary, the survey asked "At what age had the interviewee left the parental home for the first time?", whereas for Italy, the survey asked "In what calendar year had the interviewee first left the parental home?" The age/year at "leaving the parental home" was defined only for women for whom the change of family or home did not coincide with the time of first marriage or first cohabitation.

▪ ***Marriage and cohabitation*** **–** The history of marriages and cohabitations was recorded with great accuracy in both surveys, including the month and year when marriage or cohabitation first began and the date of separation (if any). For the purposes of the analysis, only the first marriage or first cohabitation was considered.

▪ ***Level of education*** **–** Both surveys reported the level of study achieved and the year in which it was achieved. When interviewees provided their level of study but not the year, we considered it to correspond to the mean duration necessary to obtain the same qualifications in the country (calculated by the survey). Educational levels were classified as follows: 'no qualifications', 'primary school', 'professional school' (only for Hungary, where vocational school lasts one year less than secondary school), 'secondary school', or 'university and beyond'.

▪ ***First employment*** **–** Both surveys collected information on a number of milestones in each participant's professional work experience. Here we consider only the first employment. In particular for the Italian women we consider the month and year of first employment (including non-verbal employment contract), whereas for the Hungarian women we used the age at which the first regular paid job was found.

Meso-dimension (family background variables)

The information on family background was useful because it helped us to understand the influence of the context in which a woman is brought up on her reproductive behaviour. Consequently, we considered answers from both surveys even thought the questions asked with regards to family background were slightly different between surveys.

▪ ***Parents*** **–** The Hungarian survey asked the question "Were the parents living together when the interviewee was born?", whereas the Italian survey asked the question "Are your parents separated or divorced?".

▪ ***Number of brothers and sisters*** **–** The Italian survey asked how many brothers and sisters the interviewee had, while the Hungarian survey was concerned with the number of brothers and sisters with whom the interviewee was brought up.

Macro-dimension (contextual variables):

In order to solve issues of data availability, the longitudinal data used in the model are characterized at the national level and not at the regional level. The variables included in the models refer to various "historical times" (calendar years) and are attributed to each woman. For the inclusion of context-related data, it was decided to insert longitudinal data for the entire period under study (1980 to 2002 for Hungary and 1975 to 2003 for Italy). Contextual variables changed over time but in a different way than individual variables did. This is due to the fact that each individual, and contextual sets of variables, vary with time of two different longitudinal scales: on an individual scale and on a historical scale. Individual data are longitudinal because they vary as age increases (from age 13 to 34 year-old for Hungary and from age 13 to 41 year-old for Italy), while contextual data vary with historical time (from 1967 to 2002 in the case of Hungary and from 1962 to 2003 for Italy).

After an extensive analysis, we decided to select contextual variables that describe both the purely demographic dimension (mean age at first marriage) and the cultural and moral dimension (extramarital birth rate, abortion and divorce rate) of socio-demographic changes. These statistics not only indicate societal changes that have had an impact on demographic behaviour but also have the advantage of providing an indirect measure of social norms for a given population. For example, for a woman born in 1977 (who reached 13 year-old in 1990) was assigned the mean age at marriage, the extramarital birth rate, the potential abortion and divorce rate, the percentage of the population with secondary education and with university education, the female activity rate recorded in 1990.

We also included in the model data regarding the women participation in the labour market (female activity rate by five-year age groups) and the education level of the general population (percentage of population with secondary and university level education). While we agree that the fertility support policies (which differ a lot between the two countries) may have played a role in the postponement of first motherhood, data on this were lacking. Until 1990, Hungary maintained its fertility rate thanks to numerous policies that were modified in the 1990s [for a brief survey of Hungarian policies on the family and fertility, see UNECE 1998], while Italy's action in this respect was sporadic and ineffective.

In summary, the following contextual variables were taken into account in the models (see models 3 and 4 presented in paragraph 5): mean age at first marriage, divorce rate, extramarital birth rate, number of abortions, female activity rate by age groups, and percentage of population with secondary education and higher (see scheme 2).

Scheme 2 – Contextual variables included in models

VARIABLE	DEFINITION	SOURCE
Mean age at first marriage	Mean of ages at first marriage weighted with specific marriage quotients by bride's age	GGS Contextual Database
Total divorce rate	Mean number of divorces per marriages in a given year	GGS Contextual Database
Extramarital birth	(Number of natural births / total births) per 1000	GGS Contextual Database
Number of abortions	Number of abortions by women of fertile age (15-49 age)	GGS Hungarian Contextual Database
Abortion rate	(Number of abortions by women of fertile age (15-49 age)/resident population of fertile age) per 1000	GGS Italian Contextual Database
Female activity rate (by age group)	(Female population aged x-(x+5) in labour force /female population aged x-(x+5)) per 100	International Labour Organization
Percentage of population with secondary education	(Population with secondary education / total population) per 100	GGS Contextual Database
Percentage of population with university education	(Population with university education / total population) per 100	Population Census

Event history models aim to explain whether or not an event occurs and when it occurs. In addition to different levels explanatory variables in some cases is appropriate to include in the model also interactions between explanatory variables (Windzio, 2006). In order to state the aim of the paper, we included the effect of the interaction between the age at first employment and generation. The discrete-time logit model with all these covariates is therefore given by:

$$\text{logit}\,(h_{ij(t)}) = \log\frac{h_{ij(t)}}{1-h_{ij(t)}} = \alpha_t + \sum_{k=1}^{p}\beta_k x_{k,ij} + \sum_{l=1}^{m}\beta_l x_{l,ij(t_a)} + \sum_{s=1}^{z}\beta_s x_{s,ij(t_g)} + \sum_{q=1}^{v}\beta_q x_{q,i(t_c)} + \sum_{r=1}^{f}\beta_r x_{k,ij} * x_{r,ij(t_a)} + u_{oj}$$

$$u_{0j} \sim N\left(0, \sigma_{u0}^2\right)$$

where:

$x_{k,ij}$ are the k individual covariates time independent associated with the individual i in the region j (with k ranging from 1 to p);

$x_{l,ij(t_a)}$ are the l individual covariates time dependent associated with the individual i in the region j at the various ages, which we shall now call t_a (with l ranging from 1 to m);

$x_{k,ij} * x_{r,ij(t_a)}$ are the r individual interactions considering the effect of age at first job and generation;

$x_{s,i(t_g)}$ are the s contextual covariates time dependent associated with the individual i in the historical time t_g (with s ranging from 1 to z) (e.g. divorce rates in 1990, 1991, ...);

$x_{q,i(t_c)}$ are the q contextual covariates time dependent associated with the individual i in the age class c at the time (with q ranging from 1 to v) (e.g. activity rate of women aged 20-24 years in 1990).

4.3. How to specify the baseline logit-hazard?

In the field of reproductive behaviour it would not make sense to not consider the way risk varies as a function of age. It is an known fact that women's fertility increases gradually up to a certain age to decrease drastically thereafter (Livi Bacci 1999). The *hazard* involved in having a first child showed a pattern strongly influenced by age in both Italy and Hungary. Describe the pattern of the probabilities of having a first child at time t as a function of age would therefore appear the first inevitable option that had to be taken. So that, we opted to use a risk function at the different ages that best fits data but is also parsimonious. From this viewpoint, a model which

assumed risk to be constant at the different ages would have fewest parameters but would present the highest (worst) deviance, while the general model will be the one with the most parameters and lowest (best) deviance (Singer and Willett 2003).

We used the *likelihood ratio test* (LRT) to compare the two nested models using the ratio between the simpler model ($_r$), with fewer parameters, and the more complex one ($_c$), with more parameters.

$$LRT = -2\log_e\left(\frac{\lambda_c\left(\hat{\theta}\right)}{\lambda_r\left(\hat{\theta}\right)}\right)$$

The statistics is distributed asymptotically as a chi-square random variable with degrees of freedom equal to the difference in the number of parameters between the two models. LRT can also be presented as the difference between the log-likelihood (λ), allowing us to compare these two models in terms of the difference in their deviance.

$$\begin{aligned} &LRT - -2\left(\log_e(\lambda_c) - \log_e(\lambda_r)\right) - \\ &= -2\log_e(\lambda_c) + \log_e(\lambda_r) = \\ &= deviance_c - deviance_r \end{aligned}$$

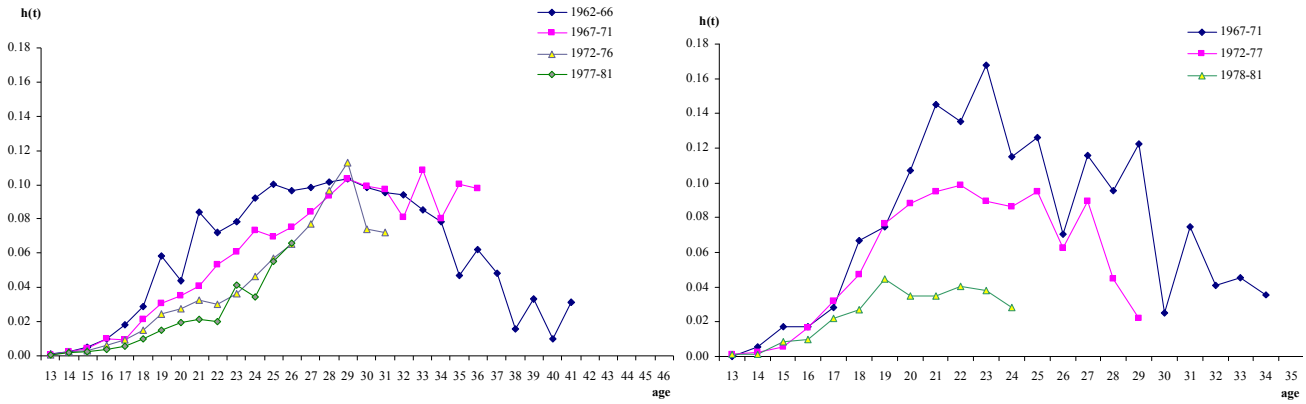
The choice of model to be considered was made by comparing the LTR value to the critical chi-square value evaluated at 0.05. Given the result of the LTR and of the analysis of hazard trends, we considered it appropriate to calculate the function of time with a third-degree polynomial both for Hungary and for Italy (LTR $_{Hungary}$= 8.3 and LTR $_{Italy}$ 31.8 both with 1 d.f.) (Table 1).

Table 1 – Estimates of risk as a function of time in Italy and Hungary

Time function (N° parameters)	Models	Deviance	Likelihood ratio test	AIC
ITALY				
Constant (1)	$logit\, h_{(t_j)} = a_{(0)}$	33,390		33,392
Linear (2)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)}$	31,614	1775.8	31,618
Squared (3)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2}$	30,600	1014.0	30,606
Cubed (4)	$\boldsymbol{logit}\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3}$	**30,592**	**8.3**	**30,600**
4th degree Pol. (5)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3} + a_{(4)}^{\ 4}$	30,559	33.0	30,569
5th degree Pol. (6)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3} + a_{(4)}^{\ 4} + a_{(5)}^{\ 5}$	30,556	3.4	30,568
General (33)	$logit\, h_{(t_j)} = a_{(1)}D_1 + ... + a_{(j)}D_j$	30,525	30.8	30,583
HUNGARY				
Constant (1)	$logit\, h_{(t_j)} = a_{(0)}$	10,398		10,400
Linear (2)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)}$	9,868	529.9	9,872
Squared (3)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2}$	9,491	376.7	9,497
Cubed (4)	$\boldsymbol{logit}\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3}$	**9,459**	**31.8**	**9,467**
4th degree Pol. (5)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3} + a_{(4)}^{\ 4}$	9,456	3.2	9,466
5th degree Pol. (6)	$logit\ h_{(t_j)} = a_{(0)} + a_{(1)} + a_{(2)}^{\ 2} + a_{(3)}^{\ 3} + a_{(4)}^{\ 4} + a_{(5)}^{\ 5}$	9,456	0.1	9,468
General (22)	$logit\, h_{(t_j)} = a_{(1)}D_1 + ... + a_{(j)}D_j$	9,436	20.5	9,480

Thanks to the flexibility of the parameterization that we used, the sample risk functions calculated, acquired the form that best fits the data. Both risk functions calculated, i.e. of Italian and of Hungarian women, showed an increasing trend of the probability of having a child during the early years of fecundity, reaching a peak which was followed by an inevitable but gradual decrease. The new generations considered here showed a trend of reduced intensity from one generation to the next in the probability of having their first child at different ages changing over time (Graph 6). The well-known decreased capacity to procreate implies that whether or not deliberate the choice to give up parenthood, voluntarily or due to socio-cultural and economic reasons, overlaps with, and is amplified by, a couple's reduced fertility over time.

Graph 6 – Empirical hazard of having a first child in Italy and Hungary by generation



5. RESULTS

We ran four multilevel fixed and causal effect models[5] on each datasets (Italy and Hungary, Table 2).[6] The model that only included the effect of region and the variation in risk function at various ages (see parameterization above) were used as the starting point to identify the effect of regional differences on its own postponement of first motherhood. The comparison of the results given by models 2 and 3 to the initial model was useful because it showed a gain (if any) in likelihood and highlighted the significance of the effect of region on the logit of the hazard of women at first motherhood. As we shall see below, the models designed showed that the logit of the hazard was significantly influenced both by women's individual characteristics (model 2), by the context they lived in (model 3), and by the interactions between age at first job and the generations considered (model 4). These three models also show that the addition of covariates reduced only in part the regional variability observed in the initial model (Model 1).

The four models assessed for Italy (see Table 2) showed that there was considerable regional variability (amounting to 0.20) in the logit of the hazard of having a first child, which decreased slightly when all covariates were included (reaching 0.19). In the case of Hungary, there was

[5] All estimation was done with the the Multilevel mixed-effects logistic regression (xtmelogit) in STATA.

[6] Preliminary and provisional results of the models regarding the Hungarian generations were described in "The Effect of Individual and Contextual Characteristics on the Reproductive Behaviour in Hungary" (Busetta A.) presented at the Workshop on "Multilevel Event History Analysis in Family and Fertility Research", Rostock 6-7 November 2007 and in the poster "Lowest low fertility in Hungary: causal aspect and demographic consequences" (Busetta, A. and Giambalvo, O.) presented at the European Population Conference on "Social exclusion and the changing demographic portrait of Europe", 6-8 September 2007, Budapest.

regional variability in logit of the hazard of having a first child (σ^2_{u0} = 0.25, standard error 0.05), which is in part explained by the inclusion of variables relating to the individual (σ^2_{u0} reduces to 0.20). While changes in context significantly influenced women's reproductive behaviour in some instances (model 3), they did not reduce second-level variance (σ^2_{u0} remained at 0.20). These results were the same whether interactions were included or not and were true for both Hungary and Italy.

Table 2 - Fixed and random effects models used for Italy and Hungary

		Model 1 *With variance components (region and age)*	Model 2 *(Model 1+ individual covariates)*	Model 3 *(Model 2+ contextual covariates)*	Model 4 *(Model 3 + interactions)*
		Estimate *(standard error)*	Estimate *(standard error)*	Estimate *(standard error)*	Estimate *(standard error)*
ITALY	RANDOM PART (2nd level) between-region variance	0.20 *(0.04)*	0.18 *(0.03)*	0.19 *(0.04)*	0.19 *(0.04)*
HUNGARY	RANDOM PART (2nd level) between-region variance	0.25 *(0.05)*	0.20 *(0.04)*	0.20 *(0.04)*	0.20 *(0.04)*

The results of the multilevel model for Italian women (Table 3) indicated that growing up in a large family (with many siblings) increased the probability of having a child and the probability of having one at a younger age (beta=0.16).

The progressive postponement of marriage (age at first marriage) had a considerable negative effect (0.84) on childbearing, while the gradual increase in mean age at marriage had no influence on a woman's choice to postpone childbearing.

The time at which a woman left the parental home had an marked effect, but in the opposite direction: leaving the parental home at a young age considerably postponed the time of first motherhood (-1.24). It would appear that in Italy leaving the family of origin early did not result in women reaching adulthood faster but tended to develop and/or reinforce individualistic values, which then led to lower final fertility. The increased instability of marital unions appears to have had a slight, indirect effect on women's option to postpone first motherhood.

Women's employment status had a significant impact on the process of postponing motherhood (-0.67), while the increased rate of female activity appeared to have no effect. The fact that there is no significant interaction between first employment and generation suggests that the age at first employment has a negative effect on the postponement of motherhood; this effect remains constant over time (i.e., from one generation to the next).

The results of the multilevel models for Hungary (Table 3) showed that women's age at first employment had a considerable effect on postponing the birth of a first child (-1.13) but this effect does not change over time (i.e., the interaction is not significant). Again, the trend of female activity rate did not have a significant effect.

University or higher education had a negative effect on motherhood (-0.75 and -0.77, respectively), while the increased rate among women with educational qualifications (secondary and university) did not have a significant effect.

Table 3 – Estimates (beta coefficients and standard errors) of model with individual covariates, contextual covariates and interactions (model 4) for Italy and Hungary

ITALY	*Coef.*	*Std. Err.*	HUNGARY	*Coef.*	*Std. Err.*
Age	3.86	*0.35*	Age	5.01	*0.49*
Age^2	-3.26	*0.57*	Age^2	-5.85	*0.81*
Age^3	0.71	*0.30*	Age^3	2.12	*0.41*
Gen. 1967- 71 (ref. 1962- 66)	0.16	*0.07*	Gen. 1972- 76 (ref. 1967- 71)	-	*n.s.*
1972- 76	-	*n.s.*	1977- 81	-	*n.s.*
1977- 81	-	*n.s.*			
Number of siblings	0.16	*0.01*	Number of siblings	0.25	*0.03*
Parents lived together	-	*n.s.*	Parents lived together	-0.19	*0.07*
Leaving parental home	-1.24	*0.14*	Leaving parental home	-	*n.s.*
Marriage	0.84	*0.05*	Marriage	1.31	*0.08*
Cohabitation	0.50	*0.16*	Cohabitation	-	*n.s.*
Primary education			Primary education (ref. no qualification)	-	*n.s.*
(ref. no qualification)	-	*n.s.*	Professional	-	*n.s.*
Secondary	-1.63	*0.36*	Secondary	-0.75	*0.32*
University	-2.50	*0.50*	University	-0.77	*0.29*
First job	-0.67	*0.23*	First job	-1.13	*0.32*
First job * Gen 67-71	-	*n.s.*	First job * Gen 72-76	-	*n.s.*
First job * Gen 72-76	-	*n.s.*	First job * Gen 77-81	-	*n.s.*
First job * Gen 77-81	-	*n.s.*			
Abortion rate	-	*n.s.*	N. of abort	-	*n.s.*
Divorce rate	-	*n.s.*	Divorce rate	0.17	*0.07*
Age at first marriage	-	*n.s.*	Age at first marriage	-1.31	*0.28*
Female activity rate	-	*n.s.*	Female activity rate	-	*n.s.*
% population university education	0.30	*0.13*	% population university education	-	*n.s.*
% population upper education	-0.26	*0.09*	% population upper education	-	*n.s.*
% extramarital births	-	*n.s.*	% extramarital births	1.26	*0.50*
Constant	-4.26	*0.14*	Constant	-4.03	*0.16*
N		*98628*	N	*27728*	
Ll		*-13404.2*	ll	*-4383.3*	
chi2		*2425.517*	chi2	*1090.603*	
df_m		*25*	df_m	*24*	
Aic		*26862.36*	aic	*8818.597*	

n.s. = not statistically significant at 5%

The progressive postponement of marriage among women had a strong negative effect on childbearing that was amplified since the macro level postponement of the age of marriage had a decisive influence on the choices made by each couple (-1.31).

The age of women at the birth of their first child increased progressively, starting with the 1967-71 cohort.[7] However, this strong and significant effect disappears as soon as the others variables are included. It would appear that although control of society has declined significantly in recent years, the general context still exerted strong pressure on the decision to become a parent at a given age (Rindfuss et al. 2003).

Growing up in a large family (with many siblings) increased the probability of having a child at a younger age which can be attributed to the intergenerational transmission of behaviour. Having parents who lived together was associated with postponement of the time of having the first child (-0.19), confirming the results of Aassve et al. (2006).

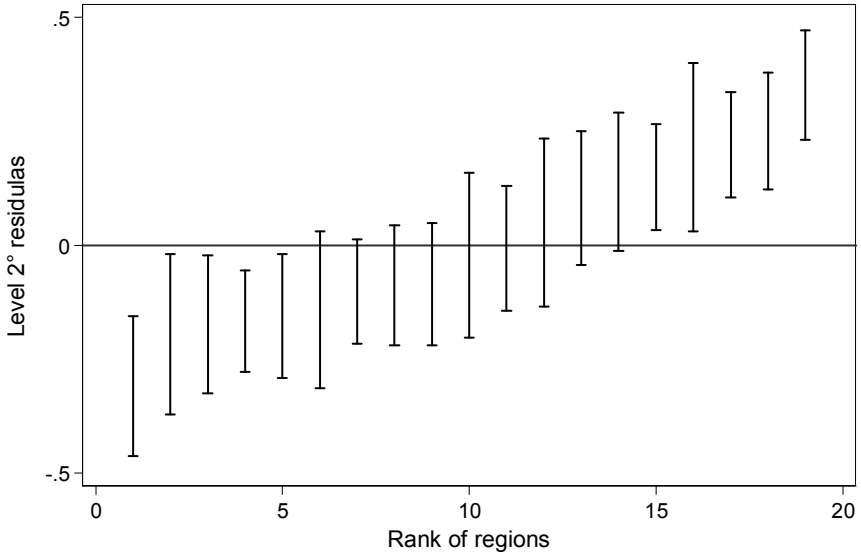
[7] The coefficients calculated in Model 2 (not showed in this article) were negative, increasing progressively from one generation to the next (-0.29 for the 1972-76 generation and -0.96 for that of 1977-81).

The increasing incidence of extra-marital births was associated with a reduction of the age at first birth (1.26), while an increase in instability of marriages (reflected by an increase in divorce rate) was positively related to the age of women at first birth (0.17). Living together did not have a significant effect on the age at first birth, probably because the majority of women who cohabited, as pointed out by Spéder (2005), did so before their marriage or after the break-up of their relationship.

As noted above, the second-level u_{0j} residuals calculated were a measure of the effect of region net to individual variables. These residuals are shown together with confidence intervals[8] in Graph 7 and 8, highlighting regions characterized by extreme situations. Note that in the random intercept model, only the intercepts vary between contexts. For each context, a specific intercept (β_{0j}) is estimated, consisting of the sum of the fixed effect (β_0) and its random component u_{0j}. In other words, the random effect u_{0j} gives a specific β_{0j} to each context (Windzio 2006).

The second-level residuals confirmed the regional variability indicated by the survival curves of Italy and Hungary. The southern regions of Italy (e.g. Sicily, Molise, Calabria, Campania, Puglia) differed from regions characterized by low fertility (Sardinia, Liguria), and from regions where the large metropolitan areas of Milan and Rome (Lazio, Lombardy) exerted a considerable influence (Graph 7). The situation of Hungary seems to be similar with the variability of the second-level residuals which reflects opposite behaviours in the Budapest area, and in small villages and towns in the Central Transdanubia and in the Northern Great Plain (Graph 8).

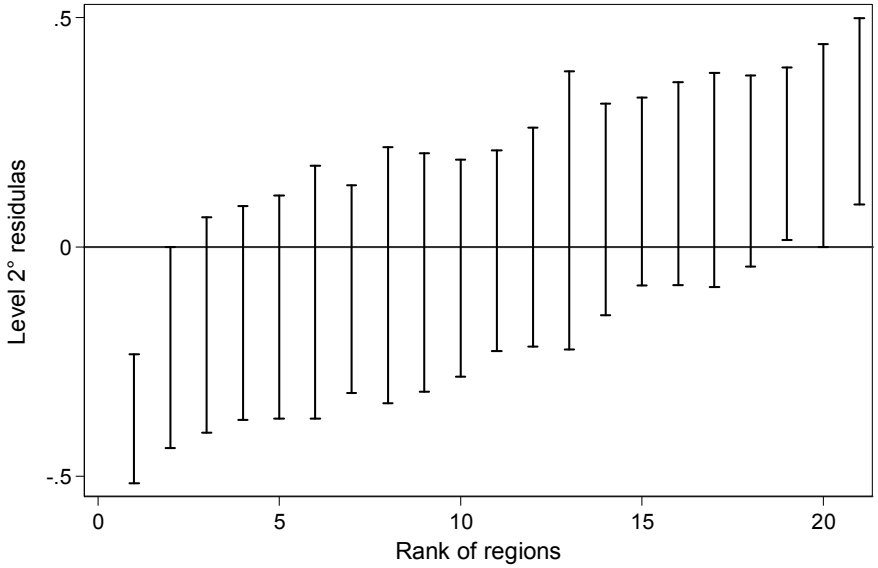
Graph 7 – Second-level residuals (u_{0j}) for model 4 in Italy



	u_{0j}
Sicily	0.35
Calabria	0.25
Campania	0.22
Molise	0.22
Apulia	0.15
Marche	0.14
Abruzzo	0.10
Basilicata	0.05
Tuscany	-0.01
Umbria	-0.02
Emilia-Romagna	-0.09
Trentino A.A.	-0.09
Piedmont	-0.10
Friuli V.-G.	-0.14
Veneto	-0.15
Lombardy	-0.17
Lazio	-0.17
Liguria	-0.20
Sardinia	-0.31

[8] The confidence intervals were constructed in such a way that two residuals were considered to be different, with a 95% significance level, if their respective intervals did not overlap (Goldstein and Healy, 1995).

Graph 8 – Second-level residuals (u_{0j}) for model 4 in Hungary



	u_0
Northern Great Plain town	0.30
Central Transdanubia village	0.22
Northern Great Plain village	0.20
Southern Great Plain village	0.17
Northern Hungary village	0.15
Southern Transdanubia village	0.14
Northern Hungary town	0.12
Southern Great Plain town	0.08
Western Transdanubia village	0.02
Central Hungary village	-0.01
Central Transdanubia town	-0.05
Southern Transdanubia city	-0.06
Southern Transdanubia town	-0.06
Western Transdanubia town	-0.08
Northern Hungary city	-0.09
Southern Great Plain city	-0.10
Central Transdanubia city	-0.13
Northern Great Plain city	-0.14
Western Transdanubia city	-0.17
Central Hungary town	-0.22
Central Hungary capital	-0.37

6. DISCUSSION

Low and very low fertility characterize an increasing number of European countries to different degrees. In particular the postponement of reproductive behaviour, described as an irreversible phenomenon (Billari 2008) or as a phenomenon characterized by a decelerating pace (Goldstein et al. 2009), showed relevant regional differences. Many analyses have attempted to determine the characteristic patterns, determining factors, and consequences of this postponement, but the overall picture remains fragmentary, with large numbers of specific studies focusing on a limited number of potential explanatory variables.

Many researchers have suggested that the decrease in fertility observed over the last few decades is linked to the increase in women's educational level and their growing participation into the labour market. As a result, European countries with the lowest fertility levels have relatively low levels of female participation to the labour force, while countries with higher fertility levels tend to have relatively high female labour force participation rates. Some researchers have shown a change in the sign of the cross-country correlation between the total fertility rate and the female labour force participation rate in the countries of Organization for Economic Cooperation and Development (OECD) in the last decades (e.g. Brewster and Rindfuss 2000; Ahn and Mira 2002; Rindfuss et al., 2003). Others, however, maintain that neither the causality nor the time series association has changed over time (Engelhardt *et al.* 2004; Kögel 2004). de Laat and Sevilla-Sanz (2011) suggested that this change may be due to an alteration of the social context of the fertility-related behaviour which has helped to uncover cross-country differences in social norms, culture, and institutional settings.

In accordance with the hypothesis that country heterogeneity can influence the relation between fertility behaviour and labour force participation, we hypothesized that various factors, possibly related to the differences in labour market policies, institutional settings, education, culture, etc., affect differently the postponement behaviour. Given that the socio-economic context (e.g., institutional regulations, funding of childcare services, cultural norms, etc.) may vary a great deal in time and also across regions within countries, we studied the behaviour of Italian and

Hungarian women within a two-level hierarchical structure, with the region at the second level and the time period from the beginning of childbearing age until first motherhood at the first level. The results of the model help to identify many commonalities among the determining factors of the postponement of childbearing. Nevertheless the context (economic as well as social and political one) differs greatly between Italy and Hungary, with the behavioural similarities that clearly outweighed the differences. The multilevel event history model showed that there was a regional differentiation of behaviour among women belonging to the generations analysed in both Italy and Hungary. Although changes in the social, demographic, and economic context often have significant effects on individual behaviour, they do not help to reduce regional variance. Delayed entry into labour market has a significant negative effect on the probability of having a child. This effect remains significant also controlling for generations and regional heterogeneity. Even when the potential effect of female participation to the labour force is controlled (via the inclusion of the interactions between age at first job and generation), the postponement effect remains significant. This result seems to support the idea that the change of direction in correlation disappears once we control for the effect of country heterogeneity and time. Indeed from one generation to another, the postponement of motherhood goes hand in hand with the acceptance of deep cultural changes – by the society and its institutions – in all geographic breakdowns, in both Italy and Hungary. In Italy, it appears to have started in the northern region to then spread rapidly to the centre and, a generation later, to the south of the country, whereas in Hungary the central region (where Budapest is located) seems to be the first region to record an increase in the postponement of motherhood, while some areas in the North continue to present widespread motherhood at a early age.

Further developments in our understanding await more detailed studies on the effect of the recent institutional changes of labour market. In the last two decades many countries responded to the difficulties of national economies and labour market (Klijzing 2005) by allowing fixed-term, training, and contract positions. The recent trends which have characterized the last few years (e.g. international economic crisis and increase levels of uncertainty into the labour market, the steadfast lack of social policies dedicated to young people and lack of child-care services) have resulted in an increase in less stable and less rewarding positions to the detriment of young people. Because these positions are short-term they do not guarantee continued employment nor long-term security. These positions do not offer sustained self-sufficiency preferred before leaving of parental home, particularly before starting of a family. The risk of being an unemployed parent likely lead prospective parents to think twice before deciding to have a child. Thus, other things being equal, as the proportion of fixed-term or temporary entry-level jobs increases, we would expect an exacerbation of the gap between labour market insiders and outsiders, increasing postponement of first motherhood.

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