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Human Capital and the Entry to Motherhood in Italy

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Abstract

Increasingly, young women educate themselves for a lifelong professional career. The goal of this study is to add to our understanding of differences in the timing of first births by women's human capital. We examine the transition to motherhood in Italy, a country where the process of fertility aging is particularly advanced, applying intensity regressions to the Italian Household Multipurpose Survey of Family and Social Subjects. Our results show that paid employment strongly conflicts with motherhood in the country. Marked educational differentials in the way women's employment affects transition to motherhood were found, however. The conflict seems much stronger for medium- and low- educated women, while the tertiary educated ones are more likely to conceive their first child if they are employed. Finally, this research provides evidence that conditions for work and family reconciliation, although important, are not the only factors leading to fertility postponement.

Keywords: Education, Labor force participation, Transition to motherhood, Italy, Event history analysis

1. Introduction

More and more often, young women are spending longer periods of time in education in order to prepare themselves for lifelong professional careers. Some of them delay the decision to have the first child, while others find that there is no space for childbearing and childrearing over their life-course. Therefore, many commentators envision the changing status of women as one of the main driving forces behind the decline in fertility levels observed in all European societies (e.g., Frejka et al. 2008).

The theory beyond this state of affair is well-established. Given the high quality and accessibility of fertility control, decisions about the timing of a first birth can be seen as

intentional; that is, based on an evaluation of the costs and benefits related to childbearing, both in the short- and the long-term. Apart from the direct costs (financial expenditures), having a child also involves indirect costs. These include not only the income lost during the non-participation period, but also future earnings foregone due to non-accumulation and depreciation of human capital (Walker 1995; Gustafsson 2001). It has been widely argued in the literature that women who have their children early in life are more vulnerable to the negative impact of career interruptions on their wages than those who delayed motherhood, and instead accumulated some work experience (e.g., Hotz et al. 1997; Taniguchi 1999). Thus women may tend to defer entry into motherhood, choosing instead to invest in their human capital first in order to maximize their life-time earnings. Furthermore, they might be interested in laying more general foundations for their careers through the achievement of a higher degree of security (such as obtaining a permanent contract or entitlement to social security provisions), or the fulfillment of self-realization needs (attaining promotion and reaching a certain professional status), which constitute additional costs of early childbearing (e.g., Ranson 1998; McDonald 2001; Låppegard and Rønsen, 2005; Zabel 2006). The motivation to postpone fertility is stronger when these costs are higher. In other words, the higher the human capital depreciation rate, the steeper the income profile or the promotion ladder, and the more uncertain the employment prospects, the more likely women are to delay childbearing (Gustafsson 2001; Cigno and Ermisch 1989; Ermisch 1989). Indeed, it has been widely documented in the literature that the first birth risk rises as the time since leaving education passes (Kantorová 2004; Nicoletti and Tanturri 2008), and as women accumulate work experience (Kravdal 1994) and attain more stable positions in the workplace (Happel at el. 1984).

The magnitude of the indirect costs related to early motherhood depends on the country-specific institutional and socio-cultural contexts, such as the educational system, labor market regulations, the childcare system, and gender relationships (Gustafsson and Wetzels 2001; Mills et al. 2005; Rindfuss et al., 2004). These costs are larger in countries with rigid labor markets and a pronounced insider-outsider divide, as well as in countries that lack safety nets and family policies oriented toward supporting the successful reconciliation of motherhood and paid work (Esping-Andersen 1999; Matysiak and Vignoli 2008). Thus, women in these countries may be more likely to defer childbearing out of a fear of being forced to take a prolonged career break than in countries where the conflict between fertility and paid employment are weak.

This study aims to add to our understanding of the impact of women's human capital accumulation on the timing of first motherhood. We scrutinized the transition to motherhood in Italy, a society characterized by strong conflicts between childrearing and market work. Moreover, while the country experienced a strong increase in women's educational attainment and labor market participation in the last decades, the domestic institutions have not adjusted to the ongoing societal change (McDonald 2000). This paper aims at investigating differences in the transition to motherhood in Italy by women's accumulation on-the-job-skills. The timing of first births plays a crucial role at least for two reasons. First, having a first child later in life may leave little time for second (or higher) order births. Second, delaying the entry to motherhood may lead to childlessness.

We begin our study with a review the Italian context that is crucial to understand how the country-specific setting filter the role of human capital on the timing of first child. The study's analytical strategy and presentation of the results follow. Finally, we elaborate on our findings.

2. Changes in the transition to motherhood and in the society: the Italian story

Italy has experienced a marked decline in childbearing, and currently belong to the countries with the lowest fertility levels in Europe. Younger generations increasingly opt for late entry to parenthood, and the proportion of the childless has increased substantially in the country. In Italy, fertility postponement started with the cohorts born in the mid-1960s. As a result of these changes the mean age at first birth increased from 25 in the early 1970s, to 29 in 2007. Overall, women began to adopt a "diachronic strategy," which is "*characterized by a postponement, and then a recovery of childbearing*" (Caltabiano et al. 2006). The result of this trend is that first birth period total fertility rate had declined precipitously to 0.66 by the end of the 20th century, after reaching a maximum in 1964 of 1.02 first births per woman, and only in recent years has an increase in first birth rates been recorded. Women not only delay transition to motherhood, but they also increasingly remain childless. In Italy the proportion of childless women rose from 10% among the 1955 cohort, to 20% among the 1965 cohort.

The strong fertility postponement in Italy is accompanied by low rates of cohabitation, non-marital childbearing, and marital disruption seen in Italy set this country apart from much of the rest of Europe (Hantrais 2005). The delayed diffusion of new family behaviors is often linked to the pressure imposed by the Catholic Church, which has an exceptionally strong

position in Italy (De Rose et al. 2008). Only recently have the countries started to experience a change in union formation and dissolution patterns, manifested in an increase in marital instability (Vignoli and Ferro 2009; Salvini and Vignoli 2011), as well as in cohabitation (Gabrielli and Hoem 2010) among the younger generations. Additionally, Italy is characterized by strong attachment to the family and strong intergenerational ties. Parents support their children after the latter leave the parental home by helping them to establish an independent household, organizing a marriage ceremony, and later providing care for their children. In turn, they receive financial and emotional support in their old age (De Rose et al., 2008).

Overall, Italy experienced a series of important changes, in society in general and in legislation in particular, in a very limited time-span, mainly due to the political awakening of the young in the 1960s and the strength of the feminist movement in the 1970s (Livi Bacci 2001). For instance, advertising contraceptives was legally permitted in 1969, divorce was introduced in 1970, and abortion was legalized in 1978. All these societal transformations took place under the relatively preoccupied eyes of the Vatican and under governments of Catholic inspiration (De Rose et al. 2008). Women's employment also increased rapidly compared to that of other European countries (**Table 1**), although in Italy it is still low by European standards and Lisbon's EU targets (an employment rate for women of over 60% by 2010). The change in women's societal role is especially illustrated by developments in their educational attainment. Today more women than men in the age group 25–44 have a university degree. Between the academic years 1970-71 and 2005-06 the percentage of women obtaining a vocational or senior secondary school qualification – the Italian diploma – tripled, and today about 80% of 19-year-old women hold a diploma (Mencarini and Vignoli 2009). Overall the trend towards an increasing diffusion of tertiary education is easily foreseeable for the coming years (ibid).

Although the country has experienced a strong increase in female educational attainment and labour market participation of women in the last decades, not all has adjusted to the ongoing societal change (Livi Bacci and Salvini 2000): working hours, public services, family structures, and (very limited) male participation in domestic chores, among others, indicate that the old-fashioned notion that women should be housewives is still alive. This state of affairs has long supported the prevalence of the male breadwinner model that maximizes, on the one hand, men's income security and, on the other, women's time availability at home (Vignoli and Salvini 2008). Although only very few political actions have effectively tackled the conflict between motherhood and work, the dual earner model is

becoming more and more widespread, and in some regions of the North it is now competing with the sole male breadwinner model. The contrast generated by women's increasing desire to participate in paid employment and the traditional family-oriented welfare state results, among other things, in lower-than-desired fertility (McDonald 2000, 2001).

The strong conflict between fertility and women's employment is underlined by labor market structures (**Table 1**). In the country, in fact, part-time jobs are jeopardized, strong barriers to entry in the labor market are still present, and public childcare provision is weak when the child is very young. Altogether this situation revealed a strong polarization between working and non-working women in Italy. Namely, nearly all women who accumulated some work experience before first conception enter paid work already one year after childbirth. By contrast, women who never worked before first conception tend to remain out of the labour market after they become mothers (Matysiak and Vignoli 2010).

Table 1. Contextual indicators, Italy.

Labor market structures (in 2006) [a)]	
% part-time employed (aged 25 - 49)	27.9
unemployment of the youth (aged 15 - 24)	21.6
% temporarily employed (aged 15 - 24)	38.0
Childcare provision [b)]	
children aged 0 - 2	7.4%
children aged 3 - 6	95%
Parental leave [c)]	
Duration	6 months
Benefit	30% of monthly earnings in private sector, and 80-100% in public sector
Proportion of working mothers with children up to age 14 who receive childcare support from kin [d)]	40%
Labor force participation of women aged 25-44 [a)]	
1960	27.8
1970	30.5
1980	45.0
1990	60.2
2000	62.4
2006	67.0

Note: [a)] – Eurostat Statistics Database (Labor Force Survey data), [b), c)] – Neyer (2003) and De Rose et al. (2008), [d)] – Eurostat Statistics Database (data from the "Reconciliation between work and family" survey 2005).

3. Three hypotheses

Based on the considerations and the context review outlined so far, we formulate three crucial hypotheses regarding the role of women's human capital on the entry to motherhood that function for the Italian context.

First, we expect to record a strong conflict between paid employment and motherhood.

Second, we expect some groups of women to be particularly likely to delay the entry into motherhood. These are women who have just started their careers, and need to establish their position in the labor market. The postponement strategy may also be more often implemented by women with higher levels of education who display a stronger orientation toward having a professional career. They may tend to defer childbearing particularly at the beginning of their careers when fulfilling the desire to participate in the labor force might be more difficult.

Third, we argue that fertility ageing is largely explained by the increasing investment of women in their human capital, as manifested in the rising educational attainment and accumulation of work experience over time.

4. Data and method

We consulted a recent retrospective survey: the Household Multipurpose Survey on Family and Social Subjects (FSS), which corresponds to the Italian Generations and Gender Survey. The FSS was conducted by the Italian National Statistical Office (Istat) in November 2003 using a sample of about 24,000 households, and collecting information about 49,451 individuals of all ages. The FSS, does not contain sufficient information on unemployment spells and changes in work contracts throughout respondents' employment histories. Moreover, FSS prohibits us from carrying out analyses at a couple level because retrospective information only of the current partner are collected.

Given our data limitations, we focused on women. Each woman was followed from the age of 15 until the first conception (measured seven months before the first birth) or the date of the interview, whichever came first. We were interested in studying Italy after the onset of fertility postponement. For this reason, we chose cohorts born in the years 1967-1978. As a result, the analyzed women were 25-36 at the time of the interview. From the original sample of 4,257 Italian women born 1967-1978, we excluded women with incomplete education, birth, or employment histories; women who reported twins at first

birth. Respondents with missing values on other variables (i.e., parents' education) were retained in the sample, and additional modalities "missing" were created for these covariates. As a result, our final sample included 4,238 respondents.

With the goal of modeling the transition to first birth, we apply hazard regression specified as follows:

$$\ln\left(h(t)\right) = \sum_i \alpha_{1i} \cdot A_i\ (t) + \sum_j \alpha_{2j} \cdot T_j(t) + \sum_k \alpha_{3k} \cdot E_k(t - t_e) \cdot e(t) + \sum_l \alpha_{4l} \cdot W_l\ (t - t_w) + \\ + \alpha_5 \cdot ne(t) + \sum_s \alpha_{6s} \cdot sb_s \qquad (1)$$

where $\ln(h(t))$ is the log-hazard of first conception at time *t*, where *t* is measured in months. For simplicity, the subscripts for the individuals are suppressed. The log-hazard of first conception is composed of multiple clocks of duration dependence, each represented by a piecewise linear spline function of time. Piecewise linear splines are used to approximate continuous functions. They are functions which are linear within an a priori defined interval. The advantage of using a piecewise linear specification over a more standard piecewise constant specification is that with sufficient bend points this specification allows us to capture efficiently any log-hazard pattern in the data (Lillard 1993). The considered linear functions are: the time since the age 15, $A(t)$, calendar time, *T(t)*, and time since finishing education, $E(t - t_e)$, kicking in at t_e. The latter spline variable is interacted with the education level, *e(t)*. Additionally, for persons in employment, the log hazard of conception is constructed using the accumulated work experience, $W(t - t_w)$. This spline kicks in at the entry to work, t_w, and switches off when the person exits employment. The non-employment spells of the second or higher order are captured by the time-varying covariate $ne(t)$. In this way, we account for the effects of any possible job losses. The first non-employment spells refer to the state prior to entering any employment, and constitute the reference category for $W(t - t_w)$ and $ne(t)$. Finally, we control for the respondent's social background, sb_s, by introducing each parent's education into the model. The *i,j,k,l* represent the time intervals between the a priori specified bend points, while *s* indexes the categorical variable *sb*.

In the second step, we interact work-experience and the variable *ne(t)*, denoting non-employment of second and higher order with the woman's education level, with the goal of gaining deeper insights into the impact of human capital on first birth risk. As a result, the formula (1) takes the following form:

$$\ln(h(t)) = \sum_i \alpha_{1i} \cdot A_i(t) + \sum_j \alpha_{2j} \cdot T_j(t) + \sum_l \alpha_{4l} \cdot W_l(t - t_w) \cdot e(t) + \\ + \sum_m \alpha_{5m} \cdot ne(t) \cdot e(t) + \sum_s \alpha_{6s} \cdot sb_s \qquad (2)$$

where subscript *m* indexes the interaction between *ne(t)* and *e(t)*. Note that the time since finishing education is not present in the equation (2) because it partly captures the same phenomenon as the work experience interacted with education level.

The women who had finished their education were classified into three groups: low, medium, and high. The first category comprises women who completed only compulsory education (eight years), as well as those who continued with basic vocational education, lasting three years in Italy. The medium educated are those who completed at least four years of education at the upper-secondary level, as well as those who undertook post-secondary but non-tertiary education. Women who received a bachelor's or a master's degree were classified as highly educated. The table with descriptive statistics on our data, illustrating the occurrences and exposures, is attached in the Appendix (**Table A1**).

5. Findings

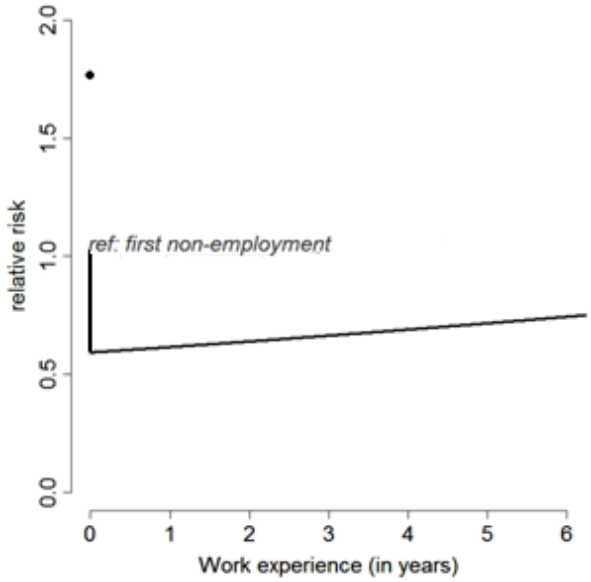
5.1. Human capital accumulation and the transition to motherhood

In this section, we present selected outcomes of our model, referring exclusively to the results displayed in **Figures 1** (that illustrates the effect of work experience on first birth risk) and **Figure 2** (that displays the estimate of the interaction between work experience and education). The full model estimates are shown in the Appendix (**Table A2**).

The empirical findings show a decline in first birth intensity at the moment women entered their first period of employment, compared to the period before, and an increase thereafter, as women accumulated work experience (Figure 1). Regardless of their employment records, employed women in Italy were shown to have a lower intensity of childbearing than women who are out of employment. The difference in first birth intensity was found to be particularly large when we compared women currently in paid work to women who used to have a job, but who exited the labor market (represented in the graph by a

filled circle). It is notable, however, that this relationship is not necessarily causal. It may well be that in Italy women leave employment in order to become mothers.

Figure 1. *Differentials in first birth intensity by work experience, Italy (cohorts 1967 – 1978)*[a]*. Piecewise linear intensity regression estimates.*



[a] *The results are standardized for a woman's age, calendar period, a woman's social background, time since leaving education, educational level, and non-employment experience.*

To gain a deeper insight into differentials in first birth intensity by women's human capital accumulated, an interaction between work experience and educational level was performed. This allowed to break down the general pattern presented in **Figure 1** by education (**Figure 2**). The differentials are marked with different type of lines (a dotted, dashed, and solid line for women with low, medium, and high levels of education, respectively); the symbols represent the first birth risks for women in the first nonemployment spell – i.e., women who never-worked (a star, a triangle, and a circle for women with low, medium, and high levels of education, respectively); and the first birth risks for women in higher order nonemployment spell (a cross, a blank triangle and a blank circle for women with low, medium, and high levels of education, respectively).

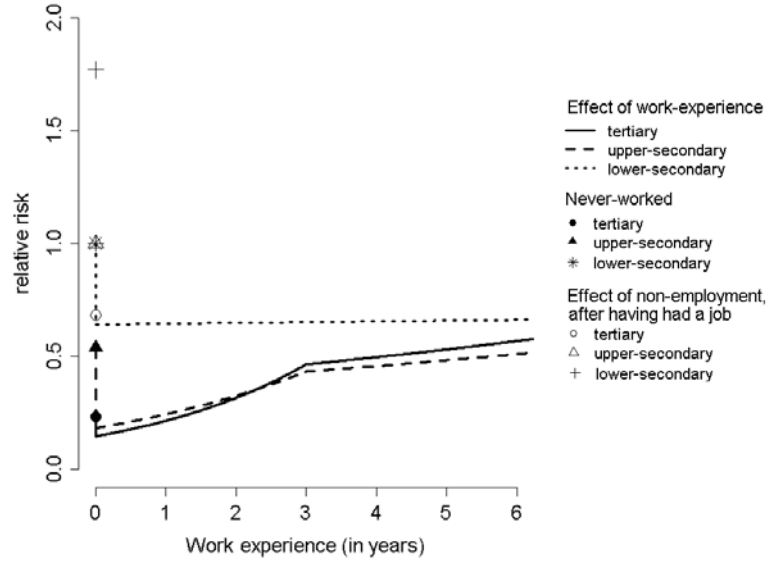
We start by looking at the findings for less educated women (those with lower-secondary education; namely up to 11 years of schooling). For this group, differences in first birth intensity with respect to work experience accumulated were not found. This is likely because women with low levels of education do not attach much relevance to the accumulation of on-the-job skills, as they are likely to be less work oriented, and tend to be clustered in the lower end of the occupational hierarchy. Nonetheless, employed women with lower levels of education were found to be far less likely to give birth to a first child than

those who do not work in the labor market. It is remarkable that the first birth risk was found to be particularly high among Italian women in their second or higher nonemployment spells, i.e., women who used to have a job but exited the labor market.

By contrast, medium educated women (those with upper-secondary education; namely 13 years of schooling) attributed higher value to the accumulation of work experience. This finding can be explained by the fact that medium educated women in Italy tend to be in jobs which are higher in the occupational hierarchy (mainly technicians and associate professionals, followed by clerks), and which therefore require a higher degree of specialization than those performed by low-educated women (authors' calculations based on Labour Force Survey, not reported here). But, even after accumulating on-the-job skills, women in Italy were shown to be less likely to have a child than those who do not work for pay. Again, those in second or higher order nonemployment spells had the highest intensity of progressing to motherhood.

Women holding university degrees exhibited the strongest increment in first birth intensity, along with the accumulation of work experience. They were more likely to conceive the first child after they had accumulated some on-the-job skills than before entering their first job. This suggests that having paid work is an important condition for having a child among women who invested in obtaining a university degree. However, women with a university degree who have stopped working for pay were shown to be more likely to have a first child than those who have a job.

Figure 2: *Differentials in first birth intensity by education and work experience, Italy (cohorts 1967 – 1978)*[a]*. Piecewise linear intensity regression estimates.*



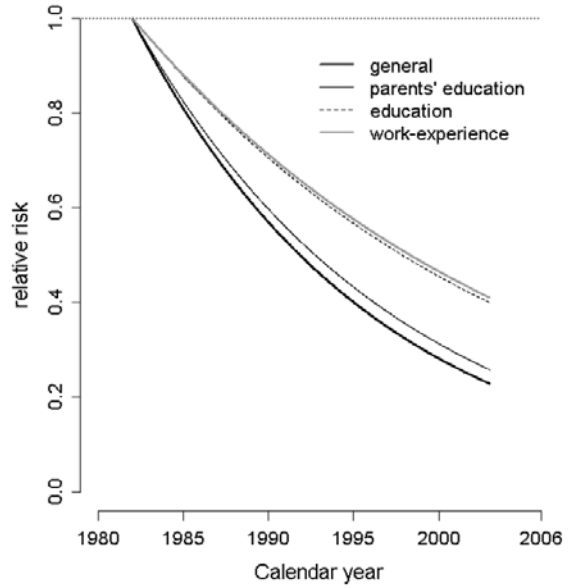
[a] *The results are standardized for woman's age, calendar period, women's social background, and non-employment experience.*

One more issue requires clarification at this point. It is possible to argue that the differences in the relationship between work experience and first birth risk by education level may have been caused by variations in the time left for childbearing after graduation between women with different levels of education. But in another paper we showed that women with low levels of education progress much more quickly to motherhood than women with university degrees, for whom the first birth risk even declines temporarily just after they have completed their studies (Matysiak and Vignoli 2009).

5.2. How much the increased interest in education and work experience accumulated matter on the changes in first-birth timing of Italian women?

Overall, these results are in line with those who envision the increased interest of women in their human capital as one of the main forces behind the marked delay in motherhood observed in many societies where the reconciliation between work and family life is not supported by domestic institutions (e.g., Mc Donald 2000). However, a crucial question remains: how strong is the role played by the increased interest in investing in education and work experience accumulated on the postponement of first birth of Italian women? To this end, **Figure 3** shows the decline in first birth risks that was observed in Italy in the recent decades.

Figure 3: *Temporal change in the first birth risk due to compositional change, attributable to parents' education, educational attainment, work experience. Stepwise estimates.*



Note that the decline is less pronounced after the changes in the status of women in the society is taken into account, namely after we control for women's social background, their educational attainment and participation in paid employment. This means that the observed change in first birth rates results partly from an increase in the number of women joining higher social population strata. Nevertheless, even after accounting for this socio-economic compositional change the overall decline in first birth risk remains substantial.

6. Three concluding remarks

This note brings about the case of Italy in the ongoing discourse on the indirect cost of children (e.g., De Santis 2008). To this end, we examined the role of women's human capital accumulated on women's strategies regarding first birth in the country. We followed a common paradigm expecting individuals to make their procreative choices intentionally, based on an evaluation, however imperfect, of the costs and benefits of reproduction. At least three crucial conclusions can be drawn from this study in response to our research hypotheses.

Firstly, results showed that employed women in Italy were in general more likely to defer childbearing than those out of paid work, irrespective of the human capital accumulated. The only exception was found for women with high levels of education. That group delays motherhood only in the initial years after starting a job and, after women accumulated some on-the job skills, they become more likely to give birth than the nonemployed. These findings illustrate that paid employment strongly conflicts with motherhood in Italy, especially among low and medium educated women. It is notable, however, that the relationship we found was not necessarily causal. It may well be that women might leave employment on purpose in order to become mothers.

Secondly, marked educational differentials in the way women's employment affects transition to motherhood were found. Tertiary educated women display visibly different behaviors with respect to low and medium educated women; namely, they are more likely to conceive their first child if they are employed. Tertiary educated women were more likely to conceive the first child than the secondary educated after they had accumulated about three years of work experience and they tended to approach the primary educated after about six years. Despite the strong conflict between women's paid work and family life recorder for the country, therefore, it seems that for this group of women finding a job is an important facilitator for becoming mother. It may also be that tertiary educated women find employment

to be favorable for childbearing, and deliberately choose to work for pay before they have a child. Overall, this finding is in line with a recent trend that has been observed in Italy in which couples with greater cultural and economic resources do not have a lower propensity to have children than their counterparts (Rosina and Testa 2009).

Thirdly, we demonstrated that in Italy the marked rise in the timing at first motherhood is largely explained by a reaction to the increasing investment of women in their human capital. But this may not tell the whole story. After accounting for this socio-economic compositional change the overall decline in first birth risk remains substantial, in fact. This suggests that fertility postponement is also driven by other factors. Exploring the housing difficulties that Italian youth are facing might be a promising path of inquiry for future research (Vignoli et al. 2011). The rising desire for self-realization through a professional career, as well as in other spheres of life, including the growing demand for leisure time, the wish to invest more heavily in the quality of children, or even a change in the value placed on children, are a few of the factors that could also be responsible for the ongoing trend toward fertility ageing.

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References

Caltabiano M., Castiglioni M., Rosina A. (2009). "Lowest-low fertility: Sign of recovery in Italy?", *Demographic Research, 21*, 681-718.

Cigno, A., & Ermisch J. (1989). A Microeconomic Analysis of the Timing of Births. *European Economic Review, 33*, 737-60.

De Rose, A., Racioppi, F. & Zanatta, A. L. (2008). Italy: Delayed adaptation of social institutions to changes in family behaviour. *Demographic Research, 7*, 665-704.

De Santis, G. (2008). The monetary cost of children. *Genus*, LX(1): 161-183.

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford: Oxford University Press.

Eurostat Statistics Database, http://www.ec.europa.eu/eurostat/, data retrieved 01 2009.

Ermisch, J. F. (1989). Purchased Child Care, Optimal Family Size and Mother's Employment. *Journal of Population Economics, 2*, 79-102.

Frejka, T., Sobotka, T., Hoem, J. M., & Toulemon, L. (eds.). (2008). Childbearing Trends and Policies in Europe. *Demographic Research, Special Collection 7*.

Gabrielli, G. & Hoem J. M. (2010). Italy's non-negligible cohabitational unions. *European Journal of Population*, 26(1), 33-46.

Gustafsson, S. S. (2001). Optimal age at motherhood. Theoretical and empirical considerations on postponement of maternity in Europe. *Journal of Population Economics*, 14, 225–247.

Gustafsson, S. S., & Wetzels, C. (2000). Optimal age for first birth: Germany, Great Britain, the Netherlands and Sweden. In S. S. Gustafsson & D. E. Meulders (Eds.), *Gender and the labour market. Econometric evidence on obstacles in achieving gender equality* (pp. 188-209). Palgrave Macmillan.

Hantrais, L. (2005). Living as a family in Europe. In L. Hantrais, D. Philipov & F. C. Billari (Eds.), *Policy Implications of Changing Family Formation* (pp.117–181). Strasburg: Council of Europe Publishing.

Happel, S.K., Hill, J.K. & Low, S.A. (1984). An Economic Analysis of the Timing of Childbirth. *Population Studies*, 38(2), 299-311.

Hotz, V. J., Klerman, J. A., & Willis, R. J. (1997). The Economics of Fertility in Developed Countries. *Handbook of Population and Family Economics*, 1A, 275-347.

Kantorová, V. (2004). Education and Entry into Motherhood: The Czech Republic during State Socialism and the Transition Period (1970-1997). *Demographic Research Special Collection 3*, 243-74.

Kravdal, O. (1994). The Importance of Economic Activity, Economic Potential and Economic Resources for the Timing of First Births in Norway. *Population Studies*, 48, 249-267.

Lappegård, T. & Rønsen, M. (2005). The multifaceted impact of education on entry into motherhood. *European Journal of Population, 21*, 31-49.

Lillard, L.A. (1993). Simultaneous equations for hazards. Marriage duration and fertility timing. *Journal of Econometrics*, 56, 189-217.

Livi Bacci, M. (2001), Too few children and too much family. *Daedalus*, 130(3),139–156.

Livi Bacci, M. & Salvini, S. (2000). Trop de famille e trop peu d'enfants: la fécondité en Italie depuis 1960. *Cahiers Québécois de Démographie: Les mutations rapides et tardives de la fécondité dans le monde industrialisé après 1960*, 29 (2): 231–254.

Matysiak, A., & Vignoli, D. (2008). Fertility and women's employment: a meta-analysis. *European Journal of Population*, 24(4), 363-384.

Matysiak, A. & Vignoli, D. (2009). Finding the "right moment" for the first baby to come: A comparison between Italy and Poland. Max Planck Institute for Demographic Rresearch WP, 2009-011.

Matysiak, A. & Vignoli, D. (2010). Employment around first birth in two adverse institutional settings: Evidence from Italy and Poland, in Schmitt C. & Trappe H. (eds.). *Gender Relations in Europe – Change or Continuity*, Special Issue of the Journal of Family Research, 3/2010: 331-346.

McDonald, P. (2000). Gender equity, social institutions and the future of fertility. *Journal of Population Research*, 17(1), 1-16.

McDonald, P. (2001). Work-family policies are the right approach to the prevention of low fertility. *People and Place, 9(3),* 17-27.

Mencarini, L. & Vignoli D. (2009). The impact of demographic shift on the tertiary education system in Italy, *Genus*, LXIV(3-4): 173–188.

Mills, M., Blossfeld, H.-P. & Klizing, E. (2005). Becaming an aduld in uncertain times: a 14-country comparison of the losers of globalization. In Blossfeld H-P., E. Klizing, M. Mills & K. Kurz (Eds.), *Globalization, Uncertainty and Youth in Society* (pp. 423-443). London and New York: Routledge.

Neyer, G. (2003). Family policies and low fertility in Western Europe. MPIDR Working Paper WP 2003-021, Rostock.

Nicoletti, C. & Tanturri, M. L. (2008). Differences in delaying motherhood across European countries: empirical evidence from the ECHP. *European Journal of Population*, 24, 157–183.

Ranson, G. (1998). Education, work and family decision making: finding the "right time" to have a baby. CRSA/RCSA.

Rosina, A., & Testa, M.R. (2009) Couples' First Child Intentions and Disagreement: An Analysis of the Italian Case. *European Journal of Population*, online first.

Rindfuss, R. R., Guzzo, K., & Morgan, S. P. (2003). The changing institutional context of low fertility. *Population Research and Policy Review*, *22*, 411–438.

Salvini, S., & Vignoli, D. (2011). Things change: Women's and men's marital disruption dynamics in Italy during a time of social transformations, 1970-2003. *Demographic Research*, 24, 145-174.

Taniguchi, H. (1999). The timing of childbearing and women's wages. *Journal of Marriage and the Family, 61(4),* 1008-1019.

Vignoli D. & Salvini S. (2008). Couples' Career, Self-Selection, and Fertility in Italy. Proceedings of the XLIV Scientific Meeting of the Italian Statistical Society, University of Calabria, June 25-27 2008. Padua: Cleup.

Vignoli, D., & Ferro, I. (2009). Rising marital disruption in Italy and its correlates. Demographic Research, 20, 11-36.

Vignoli, D., Rinesi, F., & Mussino, E. (2011). A home top plan the first child? Fertility intentions and housing conditions in Italy. Working Paper 2011/04, Department of Statistics, University of Florence.

Walker, J.R. (1995). The effect of public policies on recent Swedish fertility behaviour. *Journal of Population Economics, 8,* 223-251.

Zabel C. (2006). Employment Experience and First Birth in Great Britain. Max Planck Institute for Demographic Research Working Paper 2006-029.

Appendix

Table A1. Transition to first birth: Exposure (in woman's person-months) and events for Italy (cohorts 1967 - 1978) and Poland (cohorts 1970 - 1981).

Covariate	Exposures	Events	Abs. Rate (p. 1000)
Education			
In education	218398	73	0.33
High	35934	133	3.7
Medium	184915	713	3.86
Low	209111	1030	4.93
Employment status			
First (or higher) nonempl. spell	413575	1008	2.44
Fist empl. Spell	205376	805	3.92
Second (or higher) empl. spell	29407	136	4.62
Father's education			
Medium-high	124339	218	1.75
Low	511222	1674	3.27
Missing	12797	57	4.45
Mother's education			
Medium-high	105093	179	1.7
Low	534116	1728	3.24
Missing	9149	42	4.59

Table A2. Transition to first birth: Estimates of a piecewice linear event history model. Italy, cohorts 1967 - 1978.

	B	SE B	B	SE B
constant	-7.95***	0.29	-5.68***	0.24
Age				
15 - 20 (slope)	0.41***	0.05	0.40***	0.04
20 - 24 (slope)	0.18***	0.03	0.20***	0.03
24 - 28 (slope)	0.15***	0.03	0.15***	0.02
28 - 33 (slope)	0.02	0.03	0.03	0.03
32 - 36 (slope)	-0.17*	0.07	-0.15*	0.07
Calendar period				
1982 - 2003 IT; 1986 - 2006				
PL (slope)	- 0.04***	0.01	-0.05***	0.01
Parent's education				
Father - low (ref: medium - high)	0.18†	0.09	0.16†	0.09
Mother - low (ref: medium - high)	0.03	0.10	0.01	0.10
Years since leaving education				
High				
Exiting education (shift)	0.01	0.34		
0 - 4 years (slope)	0.45***	0.10		
4+ years (slope)	0.08	0.05		
Medium				
Exiting education (shift)	1.13**	0.12		
0 - 4 years (slope)	-0.12*	0.04		
4+ years (slope)	-0.05	0.04		
Low				
Exiting education (shift)	1.45***	0.17		
0 - 2 years (slope)	-0.08	0.10		
2+ years (slope)	-0.13**	0.02		
Work experience				
Employment entry (shift)	-0.52***	0.08		
Work experience (slope)	0.04***	0.01		
Non-employment of second or higher order (ref: first non-empl.)	0.57***	0.08		
Work-experience * education				
High				
Entry in first employment (shift)			-1.92***	0.41
Work experience 0 - 3 years (slope)			0.39*	0.16
Work experience 3+ years (slope)			0.07	0.04
Medium				
Entry in first employment (shift)			-1.7***	0.24
Work experience 0 - 3 years (slope)			0.29**	0.09
Work experience 3+ years (slope)			0.05**	0.02
Low				
Entry in first employment (shift)			-0.44***	0.11
Work experience (slope)			0.01	0.01

Non-employment of second or higher order * education (ref=first non-empl. with medium education)		
High	- .38†	0.3
Medium	0.00	0.13
Low	.57***	0.09
First non-empl. * education (ref=low)		
High	-1.46***	0.22
Medium	-0.62***	0.09
In education	-2.26***	0.13
Ln-L	-17061	-17094

Note: N=4238. The estimates presented in form of slopes show how the hazard increases or decreases over a certain time period. The interaction parameters comprise both main and interaction estimates.
†p≤.10. *p≤.05. **p≤.01. ***p≤.001.