European Population Conference: Gender, policies and populations, Stockholm, 13-16 June 2012

Compatibility between prolonged education and transition to parenthood. Role of sociopolitical contexts

by Cornelia Mureşan

Extended abstract for submission to the European Population Conference 2012

Educational attainment, enrollment in education, and time elapsed since completion of education is three ways by which education may influence transition to parenthood. Prolonged education is more or less (in)compatible with early entry into parenthood, and this relation depends undoubtedly by place and times. I start the analysis with the Romanian case, contrasting the first sixteen years of transition to democracy and market economy, with the last fifteen years of state socialism. Then I investigate the effect of education on first birth postponement in some other European countries like: Austria, Bulgaria, France, Germany, Hungary and Norway, using data from *Generation and Gender Surveys*.

As regards Romania, the decline in first-birth risks after the political turnover applies more so to women with higher level of education than to those with a lower level. If enrollment in education and transition to parenthood remains mostly incompatible regardless the politico-economical context, women's entry into motherhood is slower after the completion of education than it was before, especially among those with high level of education. The strong immediate effect of completion of studies on increasing first-birth risks is replaced by a further postponement. It seems that a greater educational differentiation of labor market opportunities and constraints brought about a corresponding greater educational differentiation in the timing of entry into parenthood in Romania.

Theoretical considerations and research hypotheses

According to the economic approach, the role of female human capital should play a central part in the timing of births (e.g. Gustafsson 2001, Kantarova 2004). The relative costs of children are affected significantly by changes in the value of time that women have at their disposal. This is because the cost of a mother's time is a major part of the total cost of producing and rearing children (Becker 1991). The "new home economics" links educational level with demographic behaviour via economic considerations, assuming that higher education leads to a higher (potential) wage and therefore to a greater "opportunity cost of childbearing" for women. Our fist research hypothesis is therefore:

H1: In market economy times, there is a negative effect of women's educational level on the transition to first birth: women with a higher level of education have a lower risk of entry into motherhood.

If motherhood postponement in market economy times may be explained (partly) by the higher "*opportunity cost of childbearing*" for higher educated, under state-socialism, the "*no differentiation by educational level*" hypothesis is more plausible. In those times most women participated in labour market activities and future earnings were highly predictable according to wage grids. Earning levels were largely dependent on age, and the timing of work interruption due to childbirth had no major influence on women's future employment and earnings. The withdrawal from the labour market after childbirth was on the whole temporary and of short duration, and the compatibility of work and childrearing was supported by public childcare provisions. We consequently assume that:

H2: During state-socialism, there is little differentiation by educational attainment in first birth risks.

Another part of explanation may come from the "*incompatibility of enrolment in education and motherhood*" and the longer time spent in education by the highly educated (Blossfeld and Huinick 1991, Skirbekk et al. 2004). This hypothesis should work both during state-socialism and during times of market economy. Blossfeld and

Huinick (1991) or Skirbekk et al. (2004), pointed out that the impact of educational level on a birth transition is largely explained by the longer time spent in education by the highly educated. The postponement of parenthood during educational activity is caused by several factors (Becker 1991; Schultz 1993; Oppenheimer 1988), including the incompatibility of education and childbearing, the increased risk of not completing education after a birth, the high opportunity costs of failing to complete education, and social norms that discourage childbearing while women are still in education.

H3: We expect to find a negative effect of enrolment in education on entry into motherhood, both during state socialism and during times of market economy.

Beside the generalized trend that women spend more and more time in education, there is another trend concerning prolongation of the period between completing studies and family formation, in order to establish and consolidate a position in the labour market. An intriguing question is whether this development affect all educational groups proportionally or whether the education differentiation in the timing of first birth is rising. The economics of the family provides a comprehensive framework for the role of women's education in the context of market economies. Several components of a "*career planning hypothesis*" must be included in the cost of children: (i) the opportunity cost of time spent with children instead of being in the labour market, (ii) the depreciation of the value of education and experience while caring for a child, and (iii) net direct child costs (Cigno and Ermisch 1989, Cigno 1991). These considerations are not the same for women with different socio-economic characteristics – such as education. Even if the effect of women's education is theoretically disputed, it is generally considered to be harmful to a career to have children during the "career building" phase, in particular for women with higher education (Liefbroer and Corijn 1999). Another aspect is the greater desire of women with high level of education to establish oneself in a career after completing education and before having a child. If the "*career planning hypothesis*" is true then one may expect a positive effect of educational attainment on postponement childbearing after completion of studies. In other words, the time interval between leaving education and first birth is expected to increase as educational level increase. However a reverse effect, of accelerated motherhood, is considered by the "*catch up hypothesis*". In this case women with high level of education, who exit from the educational system at a

sensibly higher age than their contemporaries, tend to accelerate their transition to motherhood. Such behaviour was found in some population by Kravdal (1994), Liefbroer and Corjin (1999), Blossfeld and Huinink (1991) especially among women in their late twenties.

Finding out whether education differentiation has an effect on the transition to first birth after completing education, which of effects is dominant in Romania and which in other countries, and if the effect change from one political system to the other, might contribute to the understanding of the fertility decline. However we do not expect nor a "career planning behaviour" nor a "catch up behaviour" for highly educated during state-socialism, since then completion of education was perceived as beginning of family formation for everybody irrespective of educational attainment, for the same reasons as we do not expect a differentiation of transition rates irrespective of time elapsed since end of education during the period. However we wonder if in more recent times women with high level of education started or not to postpone motherhood after completing education and if, later on, when biological clock starts ticking, they manifest or not a catch up behaviour. Our corresponding hypothesis sound as follows:

H4: In market economy times, there is a positive relation between educational attainment and the postponement of motherhood after the completion of education.

H5: Completion of education is perceived as beginning of family formation during state socialism, irrespective of the educational attainment.

Data and methods

Our empirical analysis is based on data collected by the Romanian Generations and Gender Survey at the end of 2005 (we intend to extend our analysis to other 6 GGP participant European countries). The sample consists of 11,986 respondents aged from 18 to 79 years at the time of interview, of which 6,009 were women. They enter in the analysis at age 14 and are right-censored at age 35. The period of interest covers the time span 1975-2005 and is divided according to the major changes in the social-political and economical systems after the end of 1989, so we contrast the last 15 years of state socialism with the next 16 years of market economy. We retained 2691

women from the sample as exposed to risk of entering motherhood in the period 1975-1989, and 1759 women in the period 1990-2005. A total of 1446 first births were registered in the former period and 1055 first births in the latter.

We apply hazard regression to model the transition to first conception (ending in a live birth) as a function of an underlying risk modified by a vector of covariates.

Model 1: $$\ln h_i(t) = y(t) + \sum_k \beta_k x_{ik}(t) \circ p_{ik}(t)$$

The baseline hazard by the age of a woman *y(t)* is a piece-wise linear spline in the log-hazards (generalized Gompertz), and the covariates are educational status $x_{ik}(t)$ and period $p_{ik}(t)$. Both covariates are time-varying variable and they are interacted. Educational status is constructed as a categorical variable with four levels:. "in education", "no degree", "baccalaureate or vocational certificate" and "tertiary degree". Period has two categories "1975-1989" during state-socialism, respectively "1990-2005" during market-economy times.

When we investigate the effect of education via time passed since completion we introduce, along with the age of the woman, a second "time clock" in the model (i.e. the time passed since the end of education) $z_e(t-e_i)$ which starts ticking for woman *i* at her completion of education e_i. The multiple clocks combine additively to form the overall risk of first birth in the log-hazard.

Model 2: $$\ln h_i(t) = y(t) + \sum_e z_e(t - e_i)$$

Model 2 is replicated twice, one for each of the two periods of time. For the estimation of the hazard models we use aML software, Version 2.09 (Lillard and Panis 2003).

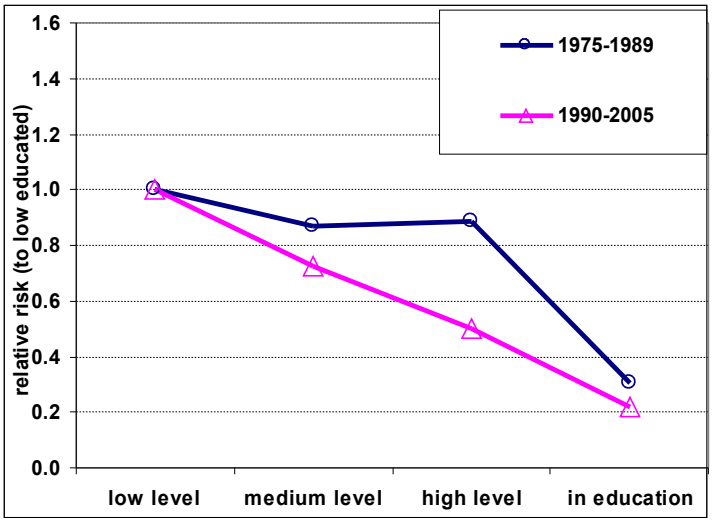
Main research findings

Effect of educational level on postponing motherhood

Figure 1 shows the relative risk of entry into motherhood by educational status (Model 1). There are two lines, one for each calendar period, and the baseline category is women without any degree during state-socialism. The line for period 1975-1989 shows definitely smaller differentiation in transition to motherhood by current educational level than the line for period 1990-2005. During state-socialism women with no academic qualifications had a higher by 13% conceiving risk than women with higher education, but there were no differences in such a risk between women with a high school diploma or a vocational certificate and women with at least a university degree. During market-economy times one could observe a clear negative gradient by educational level related to transition to motherhood. Women with a medium level of education have a first conception risk lower by 27%, and those with a high level of education lower by 50%, as women with low level of education.

One may notice no changes in first birth risk for women with low level of education from one period to the other

Figure 1. Transition to motherhood: Relative risks by educational status and period



It seems that our first two hypotheses concerning the effect of the level of education on postponing motherhood confirms.

Effect of enrolment on postponing motherhood

Beside the effect of the educational attainment itself on postponing motherhood, there is another effect of education, just of being enrolled regardless on which level of education. The latter effect is largely recognized and empirically proved in all

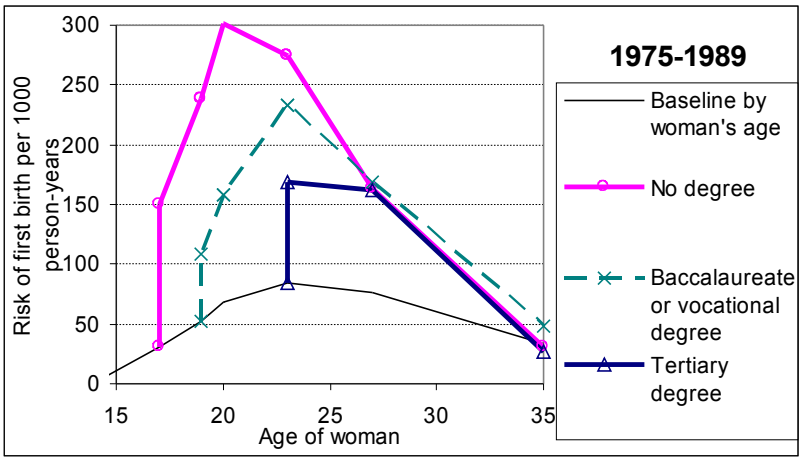
societies, and sometimes it was shown the only effect of education on postponing motherhood, as Blossfeld and Huinick (1991) have found for Germany.

The last category displayed on the Figure 1 shows that enrolled women hardly postpone their first birth, having a lower by 70% - 78% risks of entry into motherhood than women with low level of education (most women in Romania). But the socio-economic and institutional context also counts. Controlling for enrolment almost vanish the differences by educational level during state-socialism, while this effect remains untouched during the recent years. Taking into account that more people than before are now enrolled in education, and that the time spent in education is increasing, we may expect a further postponement of entry into motherhood. Our third hypothesis also confirmed.

Effect of time elapsed since end of education on postponing motherhood

To investigate further the effect of education attainment on entry into motherhood, we distinguish between the effect of the time passed since the end of education and the effect of women's age. Thus, we examine the period after participation in education and its relationship with family formation. The two "time clocks" (i.e. age and time passed since end of studies) combine additively to form the overall risk of first conception (leading to a live birth) in the log-hazard. The multiplicative effects of the time passed since the end of education are added to the hazard of first birth by women's age at the ages typical for completing education at the respective level (17, 19, and 23). The risks are visualized in Figure 2 and 3.

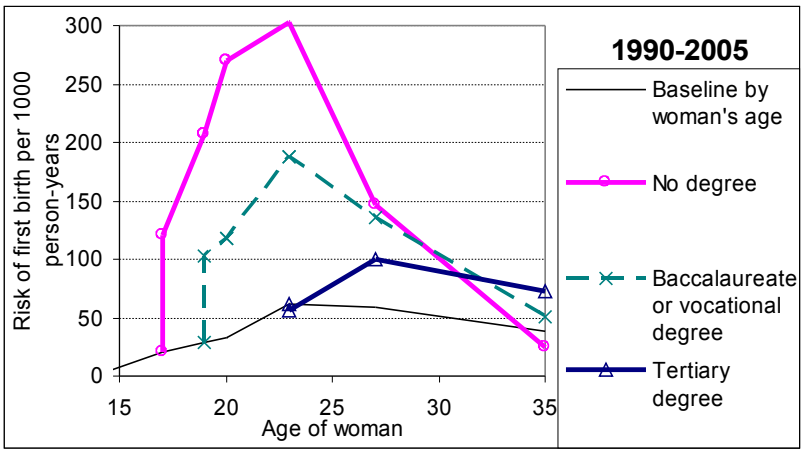
Figure 2. Transition to motherhood: effects of time elapsed since end of education for the various education levels, period 1975-1989



In the late 1970' and the 1980's the risk of conception quadrupled after completion of compulsory school and doubled after completion of a degree. For a few years, the risks were rising or remained stable and then they declined (Figure 2). Education completion was strongly perceived as beginning of the family formation period, regardless the level achieved. But, after age 27 there are no more differences in birth risk by level of education. This may be the result of societal norms on early entry into motherhood, strong at that times, i.e. the '"ideal" being before 25, but not much later than 30. As much a woman spend more time enrolled in order to obtain a higher educational level as she remain less time to enter into motherhood before age 30. But, since the biological clock to motherhood is not yet a problem at an age before 30, women with higher educational level have had no more reasons than the others to hurry with family formation, once they did not shortly after completion of education. Consequently, we do not observe nor a "catch up effect" nor a "career planning effect" for women with high level of education.

Situation changed in the more recent times, when returns to education become more important. The effect of age itself slightly diminishes, and differences by time since end of education become more important (Figure 3).

Figure 3. Transition to motherhood: effects of time elapsed since end of education for the various education levels, period 1990-2005



Particularly women with a university degree have low risks of first birth immediately after completion of studies, with a subsequent rise in risks thereafter. This reveals that the period between education and family formation constitutes a distinct part of life in which young educated women establish their position on the labour market and pursue their education attainment. A "career building" phase appears in the life of women holding a tertiary degree diploma, which was not the case in the period before

the political turnover. At the opposite end, women with no academic qualification still have increased risks of first childbirth shortly after the completion of compulsory studies, and practically they have the same risks of childbearing at any age as during the state-socialism period. For women with medium level of education the age profile of entry into motherhood after completion of studies did not change dramatically: a similar tripled risk of family formation immediately after completion of studies as before, but a slightly smaller increase in the very next four years. These women have comparatively limited prospects on the labour market and are less motivated to translate their education into labour market activities than women with higher level education. The various transformation of entry into motherhood from one calendar period to the other conducted to a situation in which appears a positive educational gradient in first birth risk for women aged 30-35, while at younger ages the gradient remained negative (Mureşan and Hoem 2010). So, signs of "catch up effect" appeared after age 30. Our last two hypothesis also confirmed.

Conclusions

Investigating women's education role in postponement motherhood we have looked at two specific situations: before and after the political turnover in Romania. (Our intention is to extend the study to other 6 European countries.) Using data from the Generations and Gender Survey of 2005 and applying an event-history analysis, all our research hypotheses were found true. In the interpretation of our results we stress the importance of the institutional environment: political setting, labour market, educational system and public policies.

Thus, during the last decade and half state-socialism (1975-1989) were little differences by level of education of entry into motherhood, and these differences regarded only women with low level of education who started faster family formation than the others. Moreover, regardless educational attainment, education completion was strongly perceived as beginning of the family formation period, and women started entry into motherhood shortly after achieving their final education level. However, no recuperation phenomena of women with higher level of education, or further postponement, were observed. This is different from the Czech case (Kantarova 2004), or some occidental European countries, where women with tertiary degree were found with a higher risk of entry into motherhood immediately after completion on education then other women with a lower level of education. In

Romania of last years of state-socialism, and strong but coercive pronatalist policies, women in their late 20's had the same overall risks of entry into motherhood regardless their educational level, proving that social meaning for time to first childbearing was perceived the same for all educational attainments. Enrolment per se proved to have a strong positive effect on postponement motherhood, i.e. during studies women hardly postpone family formation, and this effect did not change with socio-economic and policies changes, since enrolled women have four times lower risks to conceive a first child than women without any academic qualification, both in state-socialism or market economy times.

In the last decade and half, during the period marked by profound societal transformations (1990-2005), changes of entering motherhood regard mainly women with a tertiary degree, regard less women with a high school diploma or a vocational degree, but do not regard women with only compulsory education. Women with higher education make use of new employment opportunities and career prospects, and their education receive grater importance in terms of prestige or income than in the state-socialism era. Highly qualified women seems to postpone family formation to a time after the consolidation of employment, i.e. acquiring some job experience, making the most of education attained, creating improved conditions for prospective maternity leave with the right to a period of job protection.

It is also possible that social norms regarding ideal age at entry into motherhood are changing character from being universal to having different social meanings for various education levels, since we found an inversed educational gradient of transition to motherhood by age of women, from negative at younger ages to positive at age 35. This idea deserves further investigation and data from the second wave of Generation and Gender Survey would be very helpful.

References

Becker G. (1991). *A Treatise on the Family*. Cambridge: Harvard University Press.

Blossfeld H, Huinick J. (1991). "Human Capital Investments or Norms of Role Transition? How Women's Schooling Careers Affect the Process of Family Formation." *American Journal of Sociology,* 97: 143-168.

Cigno A. (1991). *Economics of the Family*. Clarendon Press, Oxford.

Cigno A. and Ermisch J. (1989). "A micro-economic analysis of the timing of the first births." *European Economic Review* 33: 737-760.

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

Kantarova V. (2004). " Education and entry into Motherhood: The Czech Republic during State Socialism and the Transition Period (1970-1997)", *Demographic Research*, Special collection 3 (10): 245-272

Kravdal, Ø. (1994). "The Importance of Economic Activity, Economic Potential and Economic Resources for the Timing of First Births in Norway". *Population Studies*, 48 (2): 249-267.

Liefbroer A.C, Corjin M. (1999) . "Who, What, Where, and When? Specifying the Impact of Educational Attainment and Labour Force Participation on Family Formation." *European Journal of Population,* 15: 45–75.

Lillard L, Panis C. (2003). *aML Multilevel Multiprocess Statistical Software*, Version 2.0. EconWare, Los Angeles, California.

Mureşan C, Hoem J.M. (2010) – „The negative educational gradients in Romanian fertility." *Demographic-Research*, 22 (4): 95-114

Oppenheimer, V. K. (1988). "A Theory of Marriage Timing." *American Journal of Sociology* 94: 563-591.

Schultz T. P. (1993): "Returns to Women's Education." In E. M. King and M. A. Hill (eds.) *Women's Education in Developing Countries: Barriers, Benefits, and Policies*. Baltimore: Johns Hopkins University Press: 51-99.

Skirbekk, V., Kohler, H.-P., & Prskawetz, A. (2004). „Birth Month, School Graduation, and the Timing of Births and Marriages." *Demography*, 41 (3): 547–568.