Educational Level and Timing of Births in Hungary

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Introductions[1]

Post-Second World War fertility rates in Hungary have followed a fluctuating, but overall downward, trend. The decline has accelerated over the last fifteen years. Since 1981, the number of live births have been lower every year than the number of deaths, but the political and economic transition marked the beginning of a spectacular decline in fertility: from 1.85 in 1990, the total fertility rate fell to 1.28 by 2004.

There have been considerable changes in partner relationships and family formation as well as in childbearing. As nuptiality has steadily decreased, other forms of partnerships (mainly cohabitation) have become more popular. This phenomenon, in addition to changes to the family institution and the stability of relationships, has had its effect on fertility rates. Childbearing may be less and less tied to marriage, as the national data bears, but cohabitation does not seem to favour childbirth: substantially fewer children are born in this form of relationship than in marriage. (Spéder 2004)

In parallel with delayed permanent partnerships, and partly as a result of this, childbearing is also shifting to later in life. The mean age of childbearing women of 25.73 years in 1989 went up to 28.27 fifteen years later, and the signs point to a further rise in future.

Several empirical studies in Hungary have identified the postponement of childbearing to be more significant in the current downward trend of fertility and nuptiality than the renunciation of childbearing and family life. Evidence for this is that young people, despite choosing cohabitation as first partnership to an ever-increasing extent, tend in very large proportion to get married at a later date (Pongrácz – Spéder 2003). The premarital cohabitation option is also a major contributor to the observed rise in marriage age. Furthermore the proportion of people consciously not planning children, although slightly higher than in the past, is still very low. A study of attitudes to the family also shows that marriage and childbearing continues to be very popular among the Hungarian population, although the gap between plans and outcomes continues to grow. (Pongrácz – Spéder 2003, Spéder 2004).

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The extent to which the emergence of new marriage and childbirth patterns in Hungary can be ascribed to cultural effects, and how much it is a rational adaptation to changed economic and institutional conditions, remains an open question. There are two interpretative approaches to new demographic phenomena in post-socialist countries which are commonly used in addressing this question. One theoretical group sees the fundamental reason for changing demographic behaviour as a rational response to the changed economic situation. The most thoroughgoing representative of this view is the *economic and social crisis hypothesis.* This holds that the fall in household income in post-socialist countries and the reduction of family benefits in the 1990s encouraged people to postpone or renounce having children in order to maintain their economic welfare. (Macura 2000). The *economic uncertainty* thesis is in many respects similar, but puts responsibility for postponement of childbirth on rising uncertainty in sources of income rather than falling income levels. Rising unemployment engenders uncertainty in future income, and this has an adverse effect on the launch of such long-term investments as starting a family. (Ranjan 1999)

The other approach is based on the *second demographic transition* theory. While not denying the role of adaptation to worsened economic conditions in the spread of new patterns of partner relationships and childbirth, this theory also discerns the "footprints" of an ideational change which had already run its course in Western Europe. The theory sees post-socialist countries' falling fertility rates as being at least partly rooted in the spread of non-conformist value orientations and hence greater acceptability of non-conventional partner relationships (principally cohabitation), which generally involve later birth of children. (Lesthaeghe – Surkyn 2002).

The explanatory factors put forward in these theories may have varying effects in different social groups. If we look at how one well-defined indicator of social differences – level of education – relates to the timing of childbirth, then the theories make different predictions as to which level of education should lead to the greatest extent of postponement. The crisis hypothesis implies that it should occur with the greatest probability in groups experiencing the furthest fall in individual and family income from wages and state benefits. In Hungary, where there is a strong inverse relationship between level of education and the chances of becoming unemployed, the fall in market income had the greatest effect on the low-education groups (those without school-leaving certificates or trades). The explanation based on economic uncertainty suggests something similar: postponement of childbirth should be most probable where uncertainty is highest, i.e. among the groups without trades and

school leaving certificates and thus most exposed to long-term unemployment. However it might also be surmised that women in this situation may rationally choose to have children as a means of alleviating the uncertainty caused by the labour market. This goes beyond the predictions of the well-known theory of uncertainty reduction (see Friedman – Hechter – Kanazawa 1994), because childbirth brings a small but secure – if short term – state benefit in place of small and difficult-to-obtain work income. Thus the greatest postponement effect is to be expected is not in the most disadvantaged group, but the group with some labour market prospects to set against high unemployment risk.

The second demographic transition theory points to a completely different social group as being most prone to reduced fertility. The change of cultural values is generally most observed among people with higher levels of education, because firstly they are most open to new lines of thought and secondly – partly owing to their higher probability of social mobility – their behaviour is less bound by culturally-accepted norms. Accordingly, the emergence of such "innovations" as late childbirth or voluntary childlessness is to be expected primarily among university graduates.

Several studies have been published in recent years into the link between level of education and fertility, and we will start with a brief look at their results. Most have been "snapshots" of particular periods and have not analysed how the relationship between the two factors has changed with socio-economic and institutional conditions. The latter aspect can be well observed in post-socialist countries, where the transition brought rapid and fundamental changes in nearly every area of life. A study of the time-variation of educational level differences can also provide empirical confirmation for theories of the demographic consequences of these changes.

The changes associated with the transition took place side by side took their effects interactively. In Hungary, the decrease in household incomes and the rising social and economic uncertainty were accompanied by a process of educational expansion that had already started in the late 1980s. This increased both enrolment rates and the length of time spent in the education system. This change was closely coupled to the economic recession. Firstly, demand strengthened for schools providing higher qualifications, since further study improved the chances of finding a job, and secondly the state provided various incentives for citizens to stay in the education system as long as possible, regarding this as "a better investment" than paying unemployment benefit. Before turning to Hungary's fertility figures, we will outline some particular features of this educational expansion.

Educational level and the periods of study – educational expansion in Hungary in the 1990s

It is well known that the 1990s brought a considerable expansion of tertiary education in Hungary, but there has also been great progress in secondary education. Net enrolment rates (table 1) show that only a three-quarter of young people of secondary school age attended full-time school in the early 1990s, and now nearly all of them do. The rise of tertiary education enrolment rates is even more substantial: today nearly a quarter of young people between 18 and 22 are students in full-time tertiary education (and another quarter are still in secondary education), compared to only 8.5% in 1990. As education has expanded, enrolment rates have risen for both sexes, but somewhat more steeply for women. (Precise figures for the gender aspects of comparison by time are not available.)

Table 1: Full-time students as percentages of the population of the same age

age group	1980/81	1985/86	1990/91	1995/96	1999/2000	2004/2005
14-17	73.2	74.4	76.6	81.4	88.0	97.2
18-22	9.2	9.9	11.9	19.7	30.8	49.5
18-22 in tertiary education	7.4	7.9	8.5	11.8	17.5	24.4

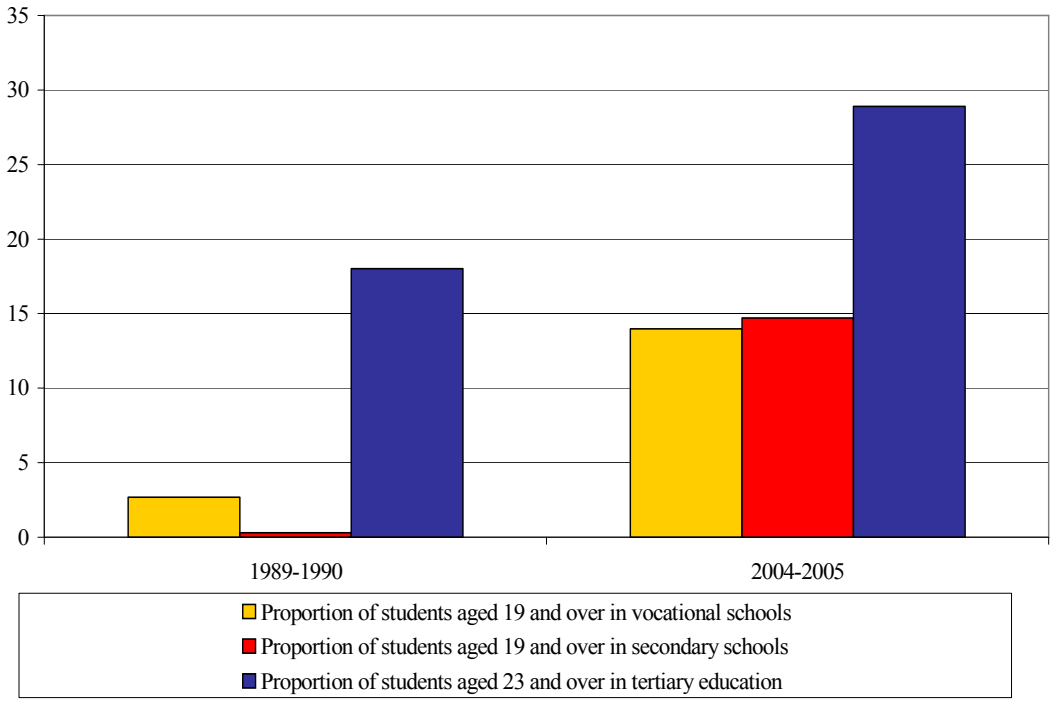
Source: Hungarian Statistical Yearbook 1980, 1985, 1990, 1995, 2004

The secondary and higher branches of education have expanded in somewhat different ways. The numbers in tertiary education have increased through very large new intake, whereas the main changes in secondary schools have come from extended periods of study. The proportions of students in schools based on trade skills and occupational subjects (vocational schools) steadily declined during the 1990s, to the benefit of secondary schools where longer studies lead up to the *érettségi* (school leaving certificate). In addition, the reorganisation of vocational training has led to increased popularity of post-secondary, non-tertiary education, which now accounts for a significant proportion of enrolments. The time spent in the education system has been raised further by the extension of tertiary courses. All of these have contributed to the ageing of the student population in both sectors (figure 1)

These two aspects of educational expansion (the rise in enrolment rates and the lengthened time spent in the education system) are jointly expressed by the school expectancy indicator, which is now 3.5 years higher than it was fifteen years ago (13.8 years in 1990, 17.2 years in

2003 full-time and part-time education together, see OECD 1998, 2005) This fact should also be taken into account when the differences in childbearing age by level of education are discussed.

Figure 1: Proportion of older students in full-time secondary and tertiary education



Source: OM (Ministry of Education) 1989, 2005

How level of education affects fertility – theoretical framework and empirical evidence

There have been many theoretical and empirical studies of the relationship between women's level of education and fertility. These studies usually formulate their preliminary hypothesis on the basis of New Home Economics, assuming a negative relationship between women's level of education and their propensity to bear children: better-educated women start having children later and have fewer children (for theoretical considerations, see Becker 1981, Rindfuss et al. 1980, Gustafsson 2001). The empirical studies on the subject have brought some adjustments to this assumption. It has frequently been demonstrated (especially among women with tertiary qualifications) that level of education does has a positive effect on postponement of the first birth (e.g. Marini 1984, Rindfuss et al. 1996, Rønsen 2004). Other

research has found that the differences by level of education in the timing of the first child are often attributable to differences in length of study (Blossfeld and Huinink 1991, Kreyenfeld 2004). Spending more time as a student pushes back the start of adulthood and thus fundamentally influences the episodes adult of life (marriage, childbirth).

As for the effect of level of education on number of births, the figures show different relationships in different countries, especially for childbearing among more highly-qualified women. The results show that the strength of the relationship between the two variables depends on the "family friendliness" of a particular country's public policy. In countries having a wide range of government measures to help reconcile work and family (part time jobs, high-level child care facilities etc.), higher levels of education have much less effect on childbearing than in countries with less generous family policy. (Hoem 2005, Kreyenfeld 2004, Oláh - Fratczak 2004). Hungarian empirical studies on the subject do not seem to support this relationship.The figures show that completed fertility rates by women's level of education tend to shape a non-symmetrical U-curve instead of a decreasing function that had been observed until the 1980s. (Andorka 1987, Szukicsné 2000, Kamarás 2001, Spéder 2003). This change took place in spite of the diminishing level of child care services and a very low rate of part-time employment.

Recently, there have been studies suggesting that the field of study has greater implications for childbearing than level of education: those studying more "feminine" subjects (education, health, culture) are less inclined to childlessness and generally have more children than those studying more "masculine" subjects (engineering, economics). (Lappegård 2002, Hoem-Neyer-Andersson 2005)

Data and method

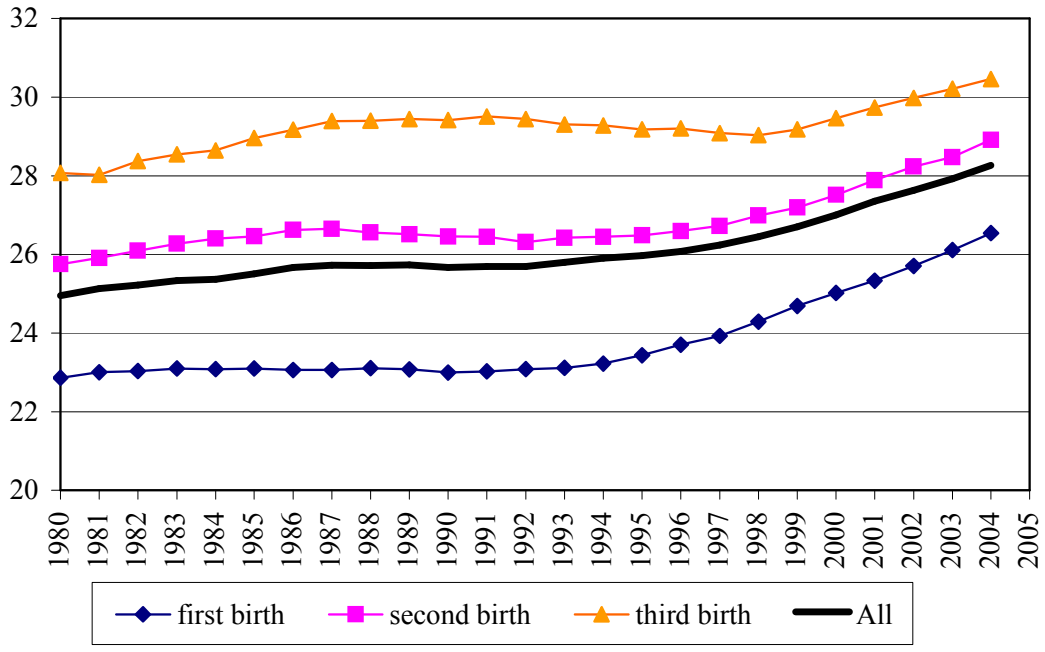
The analysis of how mothers' level of education is linked to timing of births is based on the Hungarian Central Statistical Office's demographic database for the period 1989-2004. These figures are complete for the number of births by mother's highest educational qualification, age and order of births. From these, the mean age of mothers with different levels of education were calculated for each parity. Census data on the distribution of female population by educational level and by age-groups permitted the calculation of total fertility rate by mother's level of education in 1990 and 2001. Simple statistical methods were used to process the data.

The data used in this study are aggregate data, and thus are unsuited to refined techniques such as event history analysis. However, they may be used to generate hypotheses and mark out directions for further research in to the dynamics of the complicated school - work - family relationship.

Postponement effect on fertility - Hungarian data

The rise of the mean age of childbearing women is observable from the early 1980s. The phenomenon may therefore seem unconnected with the events of the 1990s. Nonetheless, there are two arguments for assigning particular significance to the last fifteen years when looking at how timing of childbirth has changed. Firstly, the figure was just as high in the 1960s as it was in the late 1980s, and so the rise in the pre-transition decade (very modest in any case, only about one year) was actually a recovery from a previous fall. This contrasts sharply with the steep and steady rise in the mean age at which women bore children in the 1990s. Secondly, whereas the postponement was initially more marked for the second and subsequent children than for the first, the phenomenon of the first child being born later and later was almost solely confined to the 1990s. The mothering stage of the female lifecycle now starts on average 3.5 years later than fifteen years ago (figure 2).

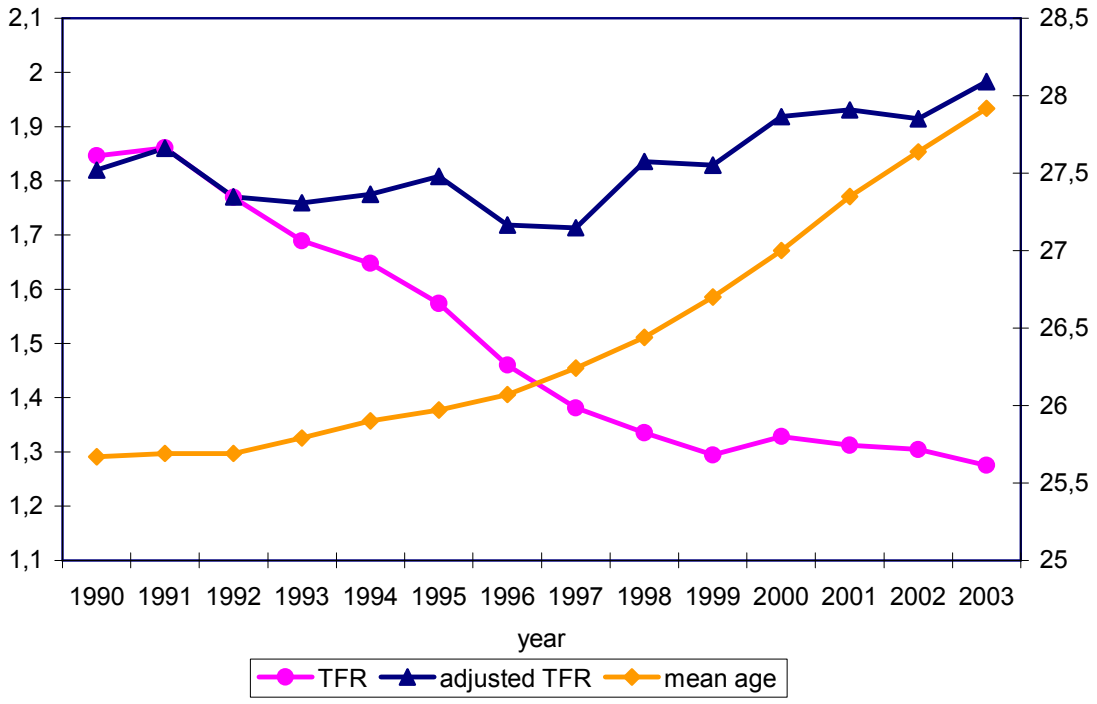
Figure 2: Mean ages of women at birth for various parities 1980-2004



Source: Demographic Yearbook 1999, 2004

The tempo effect, due to postponement of childbirth, has been calculated by Philipov and Kohler using the Boongarts-Feeney formula, for some Central and East European countries, including Hungary. Their results cover the period 1988-1998, and show that in the first half of the 1990s, the decrease in the total fertility rate derives wholly from the postponement effect, but a quantum-based fall is observed after 1995. (Philipov – Kohler 2001) However, the figures also for the later period show that the tempo effect on fertility has actually been getting stronger rather weaker since the mid-1990s. The B-F adjusted total fertility rate in 2003 was one and a half times the observed figure (figure 3).

Figure 3: Total fertility rate (TFR), the Boongarts–Feeney adjusted total fertility rate (ATFR) and the mean age of childbearing women 1990-2003



Source: Author's calculation from Demographic Yearbook 2004

The number of children actually born to women aged 40-49 is very close to the adjusted TFR figure: according to the 1990 census women of this age group had on average 1.89 children (ATFR: 1.82), but by 2001 this figure had risen to 1.93 (ATFR: 1.93).

Fertility rates for different parities show the greatest decrease in the last decade and a half to have been among second births. However, the tempo effect shows up most strongly among first births. This means that the postponement effect significantly influences the non-

birth of first children, whereas non-birth of second children can less definitely be ascribed to timing alone.

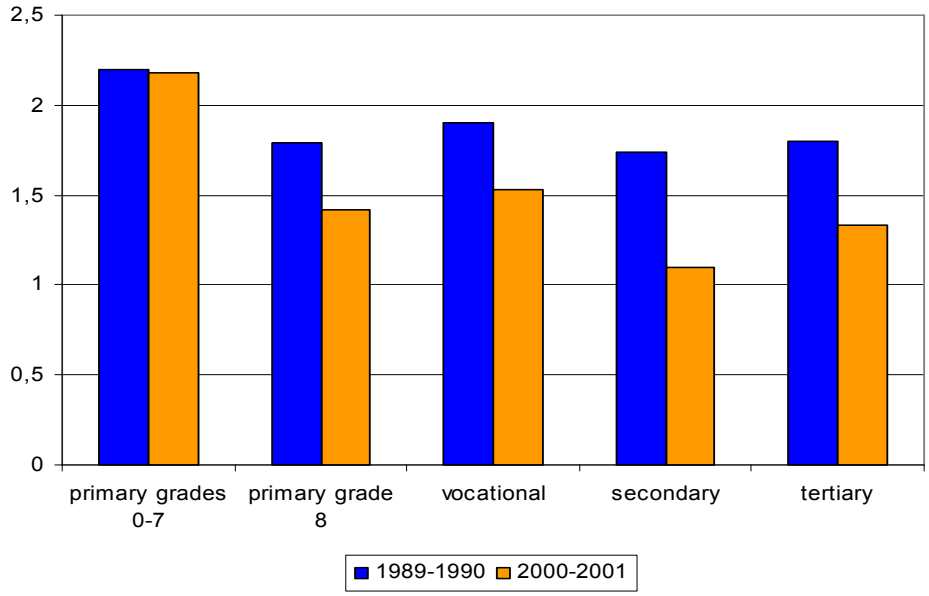
Differences in Level of Education in Timing of Childbearing

The figures show that one third of live births are to mothers having full secondary education, and 20% each to those with 8 grades of primary, vocational school qualifications and tertiary qualifications. Another 3.5% are born to those with less than 8 grades of primary education. This distribution has also changed over time. Fifteen years ago, women who had completed only primary education accounted for nearly a third of births, and the proportion among the most highly educated section was only 12%. This shift has arisen both from different fertility behaviour of different sections of the population and changes in the levels of education among the female population.

Fertility rates differentiated by level of education can only be precisely calculated for census years, because only for these is data for the female population available in the appropriate breakdown.

Around 1990, the fertility rates showed little variation among mothers of different levels of education. Since then, the figure in every educational category has decreased, but there are now significant variations between them (figure 4).

Figure 4: Fertility rates by women's level of education 1989-90, 2000-2001*

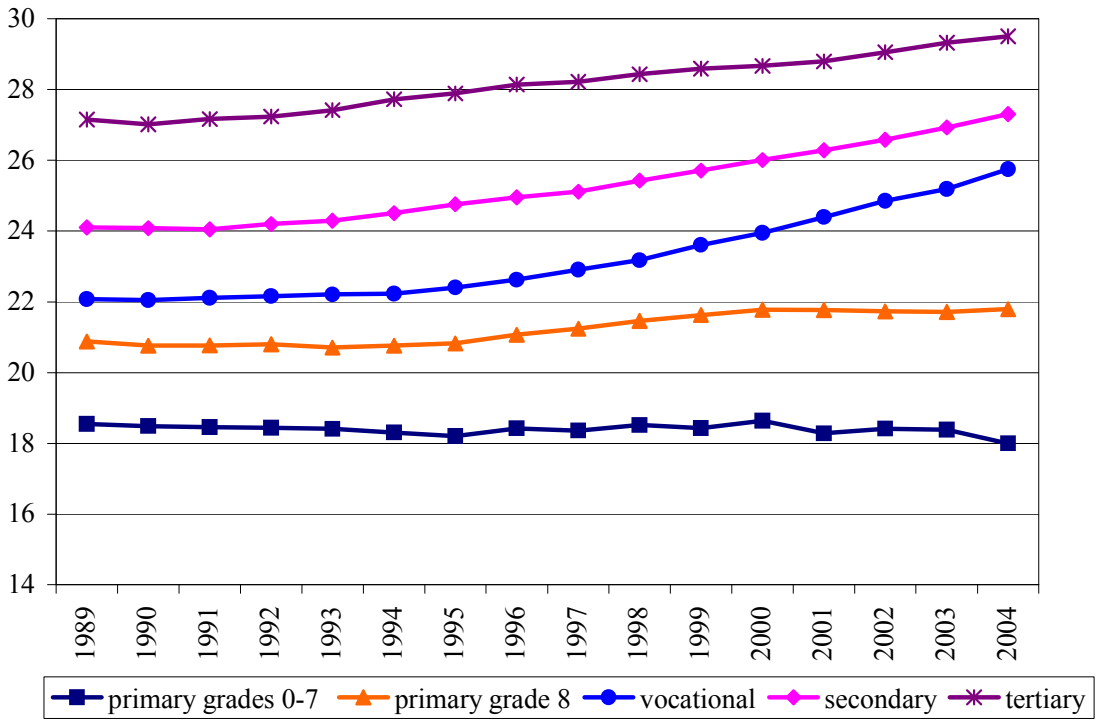


* For methodological reasons, the figure was calculated using the two-year average of live births
Source: author's own calculation

The small number of mothers with 0-7 grades of education still have a relatively high fertility. The most substantial decrease is among the more highly-educated sections, especially mothers with certificates of secondary education (*érettségi*), where the figure is only two third of what it was in 1990. Even then, it was in this section of society where fertility was lowest.

The rise of differences in fertility by level of education is partially attributable to different changes in age of giving birth. Figure 5 shows mothers' mean age at the birth of their first child.

Figure 5: Mean age of mothers at the birth of their first child by highest level of education



Source: author's own calculation

The figure clearly shows that it is *changes* in timing of births – and not just the timing itself – that differ significantly among mothers of varying levels of education. As expected, the least-qualified mothers start their fertile period at the earliest age, hardly over 18 years. Mean age calculations which include the second and third parity in addition to the first show differences of 3-3.5 years. It is striking that the age of childbirth in this section, rather

than increasing, has in fact decreased somewhat, especially at higher parities. This is a small section of society as a proportion of childbearing mothers as a whole, but their fertility behaviour, especially the high fertility rate and constantly low age of childbirth, marks them out strongly from the other social groups.

For mothers with eight primary grades, the fertile period starts around the age of 21 or 22. This has hardly changed over the last fifteen years: the mean age at first birth is 1 year higher, and at second birth 0.5 of a year later, but the age at third parity has actually decreased. At the same time, the observed fertility rate for the group has decreased substantially, so that this is indeed a case of declining fertility rather than postponement.

The fertility rate of the next two groups merits attention because the mothers involved together account for over half of all births. For mothers with vocational school qualifications, the first child was born at an average age of 22 in 1989, but this age increased very steeply from the mid-1990s onwards. There is also postponement at higher parities, but not to the same extent. Women with vocational qualifications start giving birth nearly four years later than they did fifteen years ago. A large part of the postponement can of course be ascribed to the lengthening period spent in school, but it is probable that more time also elapses between completion of school and birth of the first child. The drop in births due to postponement is the highest in this group. However, the observed fertility rate that has fallen from relatively high to medium remains the second highest.

The mean age at birth of mothers with secondary school leaving certificates, like those in the previous group, has also risen significantly. From 24 years in 1989, mothers in this group are now on average over three years older when they have their first child. The influence of educational expansion on this increase, although it cannot be established from the present data, has no doubt been substantial, because live birth statistics include in this group the constantly-rising numbers of people with "post-secondary vocational school" qualifications. However, considerable fall in observed fertility rate in this section suggests that it cannot be explained merely by postponement, but it is partly due to a significant quantum-based effect.

Mothers with tertiary qualifications were already giving birth at relatively high ages before the transition: in 1989 first births on average occurred in the mothers' 27th year. Postponement started earliest in this group. Since then, there has been a steady and linear increase, followed almost in parallel by the mean age of birth at higher parities. The age of childbirth shifted back by some 2-2.5 years between the beginning and end of period, while

differences among parities have remained stable. The increase in mean age of childbirth is certainly partly due to the extension of the period spent in tertiary education. The decrease in fertility in this group is second largest, after the secondary-qualifications group.[2]

Summary and conclusions

This paper investigates the relationship between level of education and fertility. First, the way educational level is related to childbirth timing and fertility levels is examined. Also of interest was whether this relationship has changed since the early 1990s, i.e. during the major economic and social restructuring over the last fifteen years. It is well known that period fertility has greatly decreased on the national scale in this period, mainly owing to postponed births. However, we have much less information as to whether the causes of childbirth postponement and its consequences on fertility level are the same in *every* educational-level group.

Analysis of the live birth data yielded the following results.

Around 1990, period fertility hardly varied by level of education. The highest level, as expected, was found in the least-qualified group. The observed fertility rate in other educational level groups was a few tenths lower, and showed very little spread. The differences were certainly not large enough to seen any empirical confirmation of the human capital theory. The question of whether the educational differences in timing of the first child can be explained solely by differences in time spent in education could not be decided from the data. However, it seems very probable from the mean ages that it occurred approximately 5-6 years after graduating in all groups.

A decade later, the situation had changed fundamentally. The tempo effect in the national level of observed fertility, almost absent around 1990, has now become highly significant. However, postponement of childbirth is not found to the same extent in every educational level group. This can partly be ascribed to the considerable increase in qualification differences in the fertility rate. The demographic behaviour of the least-qualified group now contrasts even more sharply from the others: they still have a relatively high

[2] The Boongarts-Feeney adjusted fertility rate, owing to the nature of the adjustment, fluctuates more widely than the observed fertility rate, and so the figures at the time of the two censuses cannot be used to establish the trend for the period as a whole. At the time of the censuses, these figures showed a mild decrease among mothers who had completed eight primary grades, and secondary and tertiary education, a mild increase in those with 0-7 primary grades, and a considerable increase among those with secondary vocational qualifications. The very high 2001 figure for the latter group is due to the exceptional steepness of the mean age curve for all parities at that time, to which the calculation is very sensitive.

fertility rate and a very young age at birth. There was a medium decrease in the fertility of those with eight primary grades, and the postponement effect there is probably very small. For those with secondary and tertiary qualifications, however, the postponement of childbirth is very significant. This can partly – but certainly not fully – explained by school system reorganisation and longer school expectancy, a process observed at both levels of education, if to different extents.

It is young people leaving school with skilled work qualifications who are most likely to postpone childbirth. This strenghten the hypothesis on the economic background of fertility decrease. When the transition to the market economy took place, skilled workers found themselves severely undermined on the labour market owing to the obsolete vocational structure and the collapse of Hungarian industry. One means of improving their job prospects was further study, to learn another, more marketable vocation or obtain a secondary school certificate. This was an option undoubtedly taken up by many, although lack of statistics means our conclusions have to be based only on age data of students in secondary education. Their postponement of childbirth is therefore partly related to the extension of time in education. However, their mean age of first births has risen to an extent which certainly implies a longer period between finishing education and giving birth to children. Observed fertility in their case shows a medium decrease, largely attributable to the tempo effect.

Whereas mothers who had graduated from skilled-labour schools reacted to the economic recession by postponement of childbirth, the fertility decrease among those with secondary and tertiary qualifications displays a quantum-based effect in addition to the tempo effect. This is particularly striking for those with school leaving certificates, whose period fertility was particularly low around 2000 – only two thirds of the figure ten years before.

As figures show, the link between level of fertility and level of education cannot be described as a simple inverse linear relationship in Hungary. Fertility level, even if postponement effect is considered is lowest not among the most qualified people, with the highest human capital and career potential, but among mothers who have only completed secondary school.

The intensifying differences by educational level prompt the question of whether we are seeing the demographic consequences of the market appreciation of human capital. The answer to this question will only be found through further research based on individual level data.

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