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Summary: Childbearing of students. The case of Sweden
This paper examines childbearing behaviour among Swedish students, and mothers' enrolment in education in the period 1984 to 1999. By means of longitudinal data on individual childbearing and study activity we detect whether the relative propensity of female students to have a child was affected by macro level changes, such as the student financial aid reform in 1989 and the economic recession in the early 1990s. It also investigates whether the dramatic increase in number of students have changed students' childbearing patterns. Finally, couples' higher order birth risks are explored, as well as the influence of the parents' student status and income on their propensity to have another child.

The results show that the reform in 1989 had no noticeable impact on students' childbearing behaviour or on mothers' propensity to enrol in education. The recession seems to have had the same negative effect on students' childbearing risks as it did on the population in general. Despite the dramatic rise in enrolment the negative effect of being a student on childbearing behaviour is stable over time. Another conclusion is that birth risks among female students differ by age and income; the negative effect of being a student on birth risks is much stronger among younger age groups. Among younger students, the propensity to have a child also seems to be slightly more dependent on level of income. Couple data showed that couples where the mother is a student show a lower propensity to have another child, while – more surprising– couples, where the father is a student, have a much higher propensity to have a second or a third child than other couples.

Sammanfattning: Studenters barnafödande
I denna studie kartläggs och analyseras barnafödande bland studenter samt mödrars benägenhet att studera. Med hjälp av longitudinella data över individers barnafödande och studieaktivitet mellan åren 1984 och 1999 undersöks huruvida den relativa benägenheten bland kvinnliga studenter att få barn påverkades av förändringar som skett på makronivå, såsom studiestödsreformen 1989 och lågkonjunkturen i början av 1990-talet. Dessutom studeras huruvida den dramatiska ökningen av antalet studenter har förändrat studenters beteendemönster när det gäller barnafödande. Slutligen undersöks pars andra- och tredjebarnsrisker och effekten av föräldrarnas studentstatus och inkomst på parets benägenhet att få ytterligare ett barn.

Resultaten visar att studiestödsreformen 1989 inte hade någon märkbar effekt vare sig på studenters barnafödande eller på mödrars benägenhet att studera. Vidare verkar lågkonjunkturen ha haft samma negativa effekt på studenters barnafödande som på befolkningen i övrigt. Trots den dramatiska ökningen av antalet studenter är den negativa effekten av att vara student på benägenheten att få barn stabil över tid. En annan slutsats är att kvinnliga studenters benägenhet att få barn varierar med ålder och inkomst; den negativa effekten av att vara student är mycket starkare bland yngre åldersgrupper. För yngre studenter verkar även inkomstens storlek ha större betydelse för benägenhet att skaffa barn. Pardata visar att föräldrapar där mamman är student har en lägre benägenhet att få ytterligare ett barn, medan – kanske något mer överraskande – par där pappan är studerande har en betydligt större benägenhet att få ytterligare ett barn jämfört med andra par.

Contents

Sara Thalberg

Childbearing of students. The case of Sweden

1. Introduction

The growth in educational attainment is one of the most fundamental social changes in Europe at the end of the 20th century. Both the number of students and the years spent in higher education have increased substantially. In an international comparison Sweden has the highest percentage attaining tertiary education of all countries in Europe (OECD 2006). What also distinguishes Sweden in this aspect is that Swedish students are relatively old, they have one of the highest average ages when entering university and they also leave university at a high age; almost one in three students are above 30 when they take their exam (Statistics Sweden 2008b). Even though many students are in the "childbearing ages", students have lower fertility than any other group. Previous studies have shown that female students[1] have a 50 percent lower probability of having a first child compared to other women while the corresponding probability for male students is about 42 percent lower (Duvander and Ohlsson 2001).

The low fertility of students has often been taken as evidence of normative rules on the necessity of getting established in adulthood before considering having children (Marini 1985). However, this association may also be reduced to economic arguments as students' low earnings are generally not perceived compatible with the establishment of a family with children. In the case of Sweden, low earnings also mean a low parental-leave benefit. Students that have not worked before enrolment, and

[1] "Student" here defined as a person who receives student financial aid.

therefore do not qualify for the earnings-related parental insurance, receive a very low amount.

As the Nordic countries in general, and Sweden in particular, often are taken as a reference when discussing the possible impact of various family policies on fertility behaviour, it is valuable to complement previous studies with a study that specifically addresses the circumstances for students. The findings will give some indication whether there is scope for supportive family policies to enhance an earlier onset of childbearing so that it may precede the completion of education – or if instead normative rules on the sequencing of events in young adulthood leave such interventions without any noticeable effect on behaviour. As the possibility of stimulating an earlier onset of childbearing sometimes is suggested as a remedy for falling fertility in Europe (see for example Skirbekk, Kohler and Prskawetz 2004 and Lindh 2008), it is essential to examine whether students' childbearing behaviour indeed may be affected by economic factors.

The aim of this paper is to examine childbearing behaviour among students in the period 1984 to 1999. By means of longitudinal data on individual childbearing and study activity we will detect the possible effects of changes on the macro level, such as the student financial aid system and the business cycle, on childbearing risks and enrolment trends. We will also investigate how variables such as income and age affect students' childbearing. In addition, we look at couples' higher order birth risks and explore the influence of student status and income for both parents on the propensity to have another child. Our research questions are as follows:

1. Has the relative propensity of female students to become a parent or to have another child been affected by changes in the student financial aid system?
2. Did the economic recession in the early 1990s have an effect on student fertility?
3. Has the propensity to enrol in higher education among women in different age groups, with and without children, changed during the period 1984 to 1999?
4. How does age and earnings moderate the effect of being a student on childbearing risks?
5. How does income and student status affect a couple's higher order birth risks?

2. Background

2.1. Childbearing trends

Childbearing is often said to be the last and major transition towards adulthood. As most European countries, Sweden has experienced a postponement of first births in recent decades and mean age at first birth has now reached 29 for women and 31 for men (figure 2) (Statistics Sweden 2008). Despite the higher ages at first birth, the fertility rate in Sweden is today one of the highest in Europe. However, as shown in figure 1, Sweden has experienced strong fluctuations in its fertility levels in recent decades. Like in other European countries, fertility rates decreased during the 1960s and 1970s. During the economic boom in the late 1980s fertility increased considerably and in 1990 and 1991 it even exceeded the replacement level. Thereafter followed the economic crisis and a subsequent dramatic drop in TFR which in 1999 reached 1.5, which was the lowest fertility ever recorded in Sweden (Hoem and Hoem 1996). In the last couple of years Sweden has once again experienced a strong increase in TFR, which in 2007 reached 1.88 (Statistics Sweden 2007b).

The longer period spent in education is one of the main reasons behind the higher ages at first birth. Other explanations include youth unemployment, the need to get established on a job before taking the risk of a family related break, and a general tendency to postpone irreversible decisions that will bring major changes and risks in an uncertain future. Nonetheless, educational attainment and enrolment plays a central role in shaping the timing of transition to motherhood, for example do women with higher education have their first child at a higher age. The dramatic rise in enrolment during the 1990s has been shown to have contributed to the fall in fertility during this period (Hoem 2000).

The postponing trend is further reinforced by the design of the Swedish parental insurance. Swedish family policy is directed towards the compatibility of family life and labour force participation and the fact that the parental leave benefit is calculated on the individual's prior earnings is a strong incentive to get established on the labour market before having a child.[2]

Having children while studying or being non-employed is relatively rare since the work requirement for eligibility consequently excludes students and others with weak labour market attachment from the earnings-related benefits. As students are relatively old in Sweden, this affects a large group

[2] To be entitled to the earnings-related parental insurance one has to work for a minimum of 240 days before the birth of the child. Those who are not eligible receive an amount at a much lower flat rate, at present 180 SEK/day (about 18 €).

of men and women in childbearing ages (Duvander, Ferrarini et al. 2005). Since a large majority of the students enrolled in higher education are women and women's fecundity decline more rapidly with advancing age than men's, the postponement of childbearing could also be seen as a gender equality problem.

According to a survey made by Statistics Sweden in 2002, the share of students who responded that the economic situation to a *very high extent* affected their attitude towards having children while being a student was as high as 77 percent, and 15 percent replied that it to a *high extent* influenced their attitude towards children. The share of students who responded that the social insurance system to a *high* or a *very high extent* affected their attitude towards having children was 64 percent (SOU 2003:130).

An additional indication of the importance of the parental insurance on childbearing decisions is that the individual income level has been shown to have a strong positive association with the propensity to give birth. This applies to men and women and for first, second and third births. The strongest correlation has been found between women's income level and first birth and it can be assumed that a strong contributing factor to this pattern is that women postpone childbearing until they have a sufficiently high income to base their parental leave benefit on. The fact that women still use about 80 percent of the parental leave days could explain the particularly strong correlation between women's income and childbearing. Moreover, the Swedish pro-cyclical childbearing behaviour is widely considered to be related to the set up of the parental leave system (Ds 2001:57; Duvander and Andersson 2003; Duvander and Ohlsson 2001).

The association between education and childbearing also works in the opposite direction, i.e. becoming and being a mother has an impact on educational attainment and enrolment. The share of women experiencing first birth before the end of education varies greatly between different countries in Europe, which underline the importance of the institutional setting in shaping the sequencing of the life course events. In the Nordic countries the share of women experiencing conceptions resulting in first birth before the end of education is much higher as compared to any other country. According to a study by Billari and Philipov, based on individual-level data from Fertility and Family Surveys, this share is as high as 41% in Sweden (Billari and Philipov 2004)[3]. According to Statistics Sweden, in 2001 the share of female students who has children was 28 percent and the

[3] Billari and Philipov (2004) focus on timing of conception rather than birth since it is during the months of pregnancy that a decision can be taken to interrupt education.

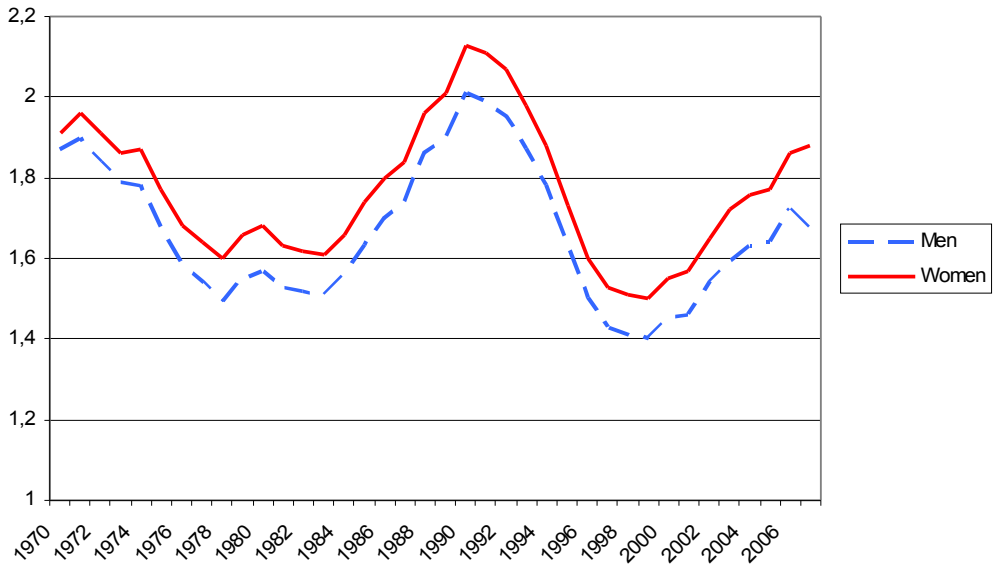
corresponding share for men was 13 percent (SOU 2003:130).[4] Considering the low fertility rates of students, this may seem a bit ambiguous. However, most evidence indicates that this is due to the fact that many young people in Sweden work for a couple of years before they enrol in higher education or take a break during their education to work and then re-enter university.

The increasing delay of first births is of concern with reference to future fertility as it shortens the length of the reproductive period and thereby reduces the number of children women will have. While first-parenthood at higher ages might be considered as positive from an economic point of view[5], since the couple is more likely to be able to support the children, it is definitely a high-risk alternative from a demographic and medical perspective. Given that fecundity declines with age, the need for assisted reproduction increases which is costly and also associated with health risks for both the mother and the child. It is also likely to lead to a higher level of childlessness in society, given both the biological and social thresholds of age at motherhood (i.e. the socially accepted age limit for becoming a mother), but also the fact that people get accustomed to a childless lifestyle and may be increasingly unwilling to give up careers, hobbies etc. for the sake of parenting (Morgan 2003).

However, it is widely known that most men and women still want children, and that their average desired fertility level approximates what is needed for replacement-level fertility. This implies that there are significant discrepancies between desired and observed fertility in most European countries. The fact that the desired fertility level is well above the actually achieved level indicates a welfare problem for the individual, but also a window of opportunity for pursuing policies that can generate a more balanced population development (Duvander, Ferrarini et al. 2005). Another key for understanding the constraints on childbearing is gender inequality and how childbearing typically involves different consequences for men and women. This raises a complex set of questions related to the sequencing of life events and the possibility of balancing education, work and family life.

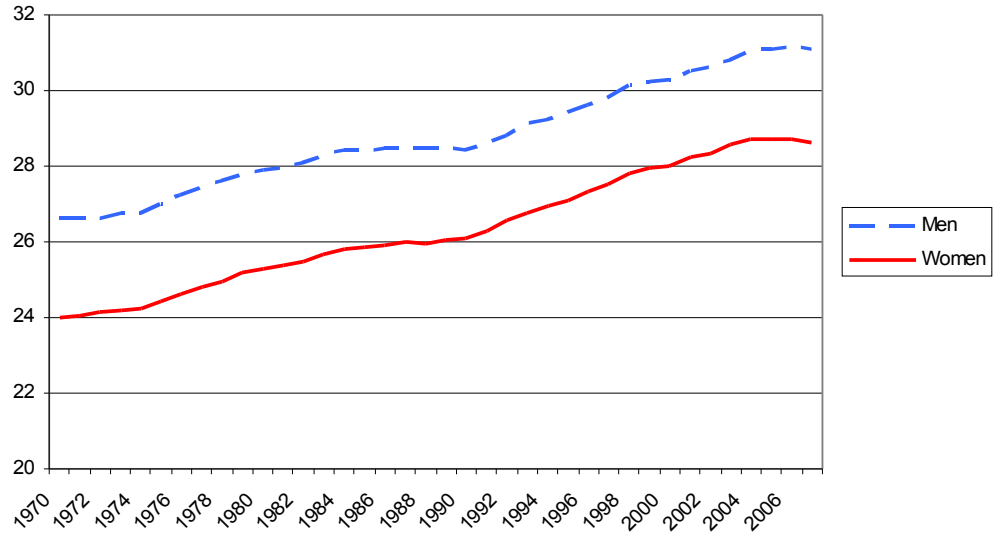
[4] Both part-time and full-time students are included.
[5] This is true only in the short run, ignoring the long-term consequences of an increased dependency burden that may result in e.g. lower pensions.

Figure 1. Total fertility rate (TFR) for Sweden



Source: Statistics Sweden (2007)

Figure 2. Age at first birth for Sweden

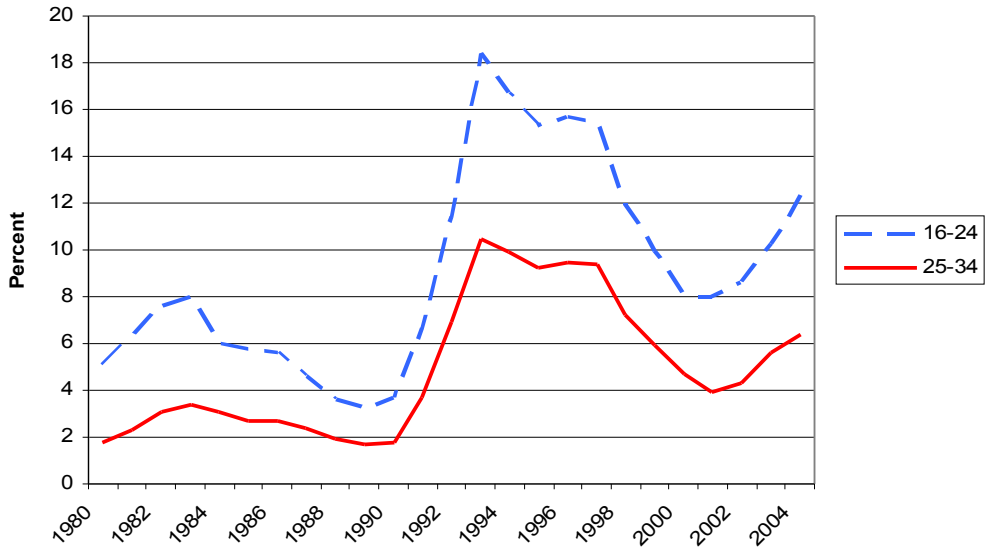


Source: Statistics Sweden (2007)

2.2. Trends in unemployment and enrolment

As mentioned above, the Swedish economy went into a state of recession at the beginning of the early 1990s after a period of economic expansion. Unemployment rose from 1.5 percent in 1990 to more than 8 percent two years later and among young adults unemployment reached even higher numbers (see figure 3). Young adults on their way out to the labour market were hit hard by the crisis. Between 1990 and 1994 the labour market participation among young adults age 20-24 declined from 80 to 55 percent. The economic downturn also resulted in budgetary problems for governments at national and municipal levels, which induced substantial cut-backs in public expenditures on several social and family policy programs.

Figure 3. Youth unemployment for Sweden, by age

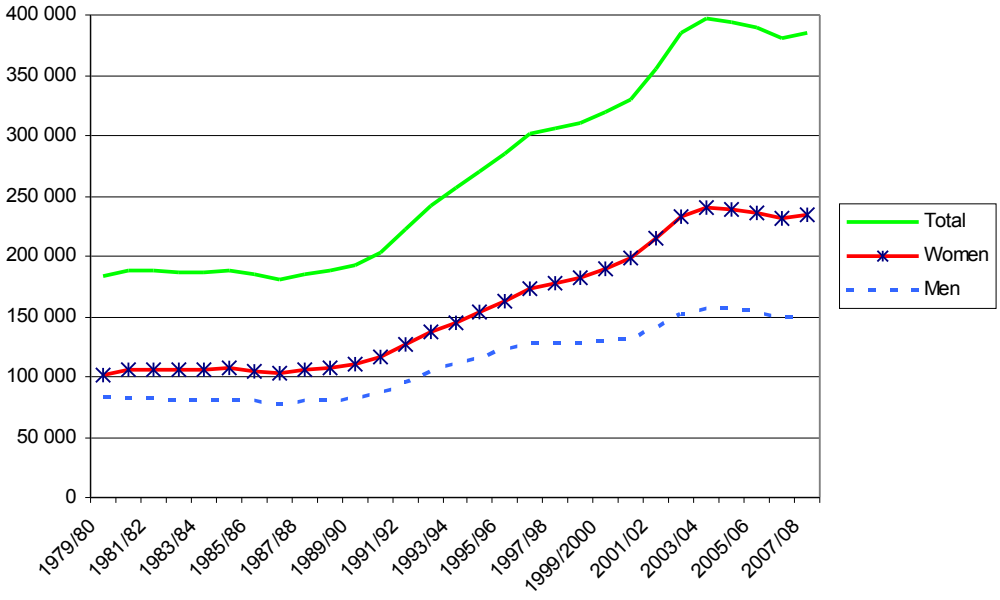


Source: Statistics Sweden (2007c)

As a result of the situation on the labour market young adults instead chose to enter university or to continue their education and the number of students increased dramatically. In addition to the economic crisis, measures implemented to realize the idea of a lifelong learning also contributed to the dramatic increase in enrolment (SOU 2003:130). As shown by figure 4 below the number of students almost doubled during the 1990s, from 200.000 right before the economic crisis to nearly 400.000 in the early 2000s. The expansion of higher education resulted in a wider and

more heterogeneous student population. However, the increase was largest in the youngest age-groups which meant that the age structure of the student population changed during this period. Another trend is that the share of female students in higher education is constantly rising. In 2007, two out of three exams was taken by women (SOU 2003:130; Statistics Sweden 2008a; Statistics Sweden 2008b).

Figure 4. Number of students enrolled in higher education, Sweden



Source: Statistics Sweden (2008a)

2.3. Student financial aid

All students in Sweden below age 54 enrolled in higher education are entitled to financial assistance for a maximum of 12 semesters[6]. This aid consists of a non-repayable grant plus a loan to be repaid with low interest. Student financial aid was initiated as early as 1919 and was then a loan that had to be paid back within ten years. In 1957 all students became eligible to a non-repayable study grant. In 1965 a student financial aid system was implemented that broadly is the same system Sweden has today. Ten years later, adults were given the opportunity to study at high school level ("komvux") and an adult financial aid system was introduced, which meant

[6] 240 weeks.

that adult students received financial assistance at the same level as if they had obtained unemployment benefit ("a-kassa") (CSN 2008).

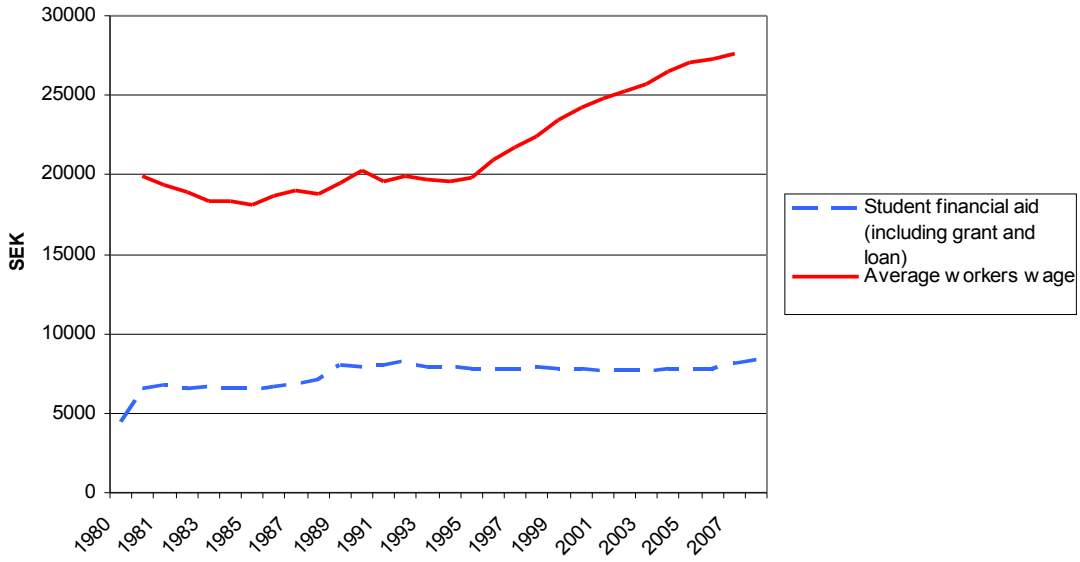
In 1989 there was an extensive reform of the student financial aid system. The regulations for repayment of loans were changed, the non-repayable grant was raised substantially and the financial assistance for studying abroad was enhanced. However, the possibility to obtain an additional loan if you had children was eliminated (CSN 2008). This means that for students with no children or one child the economic situation was improved after the reform, but for students with more than one child the financial aid was reduced. Ten years after the reform this policy change was pointed out as detrimental to students' possibilities to start a family by the work group appointed by the government to investigate what causes affect childbearing (Ds 2001:57).

In 2001 the financial aid system was reformed again. The adult student aid was removed and the repayment system of study loans was made stricter. Repayment of the loan is structured as an annuity-like system, according to which study loans should normally be repaid after 25 years or by the time the borrower has reached the age of 60. In 2002, the government initiated a comprehensive review of the economic and social situation of students and how the student financial aid system interacts with the social insurance system and other welfare benefits. One aim was to look into what opportunities there are to effectively facilitate the economic situation for students with children. The starting points for the investigation included that life-long learning should be facilitated, the student financial aid system should work well with the social insurance system, the system should contribute to gender equality, and finally, the system should benefit childbearing (SOU 2003:130).

In 2006 an extra child supplement for students was reintroduced in order to support children in economically disadvantaged families and make it easier for parents to enrol in education (Ds 2004:33). Unlike the previous child supplement that was removed in 1989 this supplement is a grant given to the students. The supplement is calculated on the number of children; one child entitles a student to 2460 SEK per semester (about 240 €), two children 4018 SEK (about 400 €) and three children 4838 SEK (about 480 €). During the first semester after the introduction as many as 62 500 students received this supplement. More women than men received the supplement; 21 percent of the female university students and 6 percent of the male. The average age of the children was 8.3 years, which implies that most students had their children well before enrolment. About half of the students with children are above 35 (CSN 2008).

More than 80 percent of all students receive some kind of student financial aid and among students age 19-24 this share is above 95 percent. Even though the student financial aid offered in Sweden is quite generous compared to many other countries it is considerably less than an average workers wage (see figure 5 below). According to calculations by Swedbank, a single student that receives both study grant and study loan has, after all "necessary" expenses has been paid, 200 SEK (about € 20) left to manage on each month. What's more, the calculation assumes that the student receives housing allowance, which only about 14 percent of all students do, and if the student does not receive housing allowance he or she runs at a loss every month. To support a child on this low income is of course difficult unless the student has a partner with a well-paid job. In 2007, 60 percent of all students worked extra to make ends meet, and 25 percent received financial support from their parents or other relatives. Among the youngest students this share was even higher (Statistics Sweden 2007).

Figure 5. Student financial aid per month as compared to an average workers monthly wage[7] before tax, in prices of 2007



Source: CSN (2007) and Statistics Sweden (2008c)

[7] From 1994 average workers wage include both part time and full time employees, which means that the real increase in wages is even higher.

Figure 6. Study grant and child supplement for 1, 2, 3 children, per month[8], in prices of 2007.

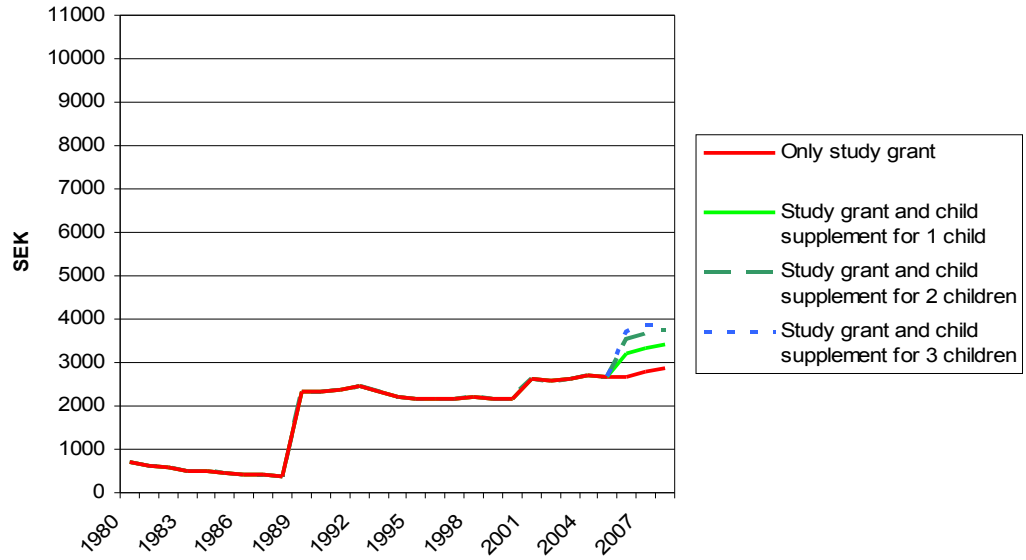
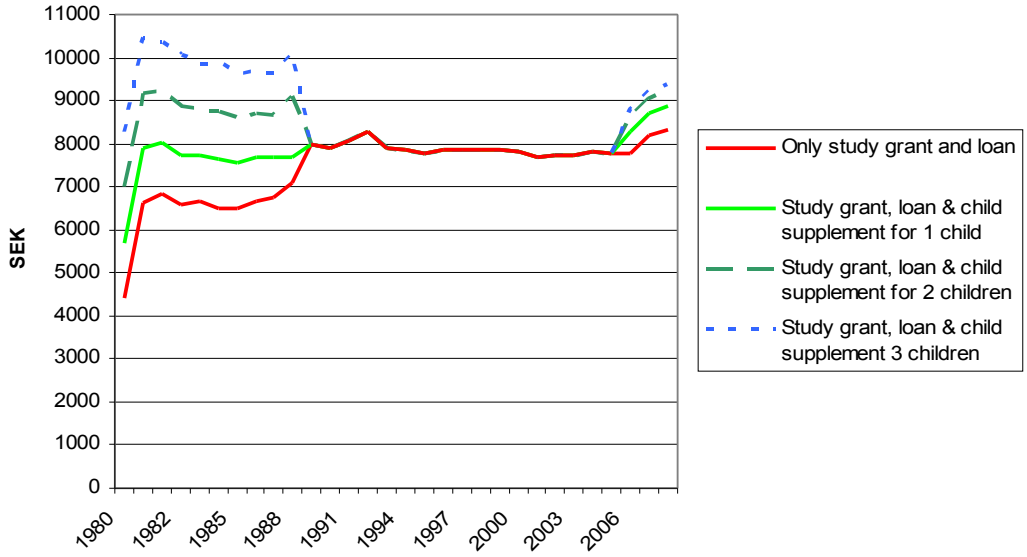


Figure 7. Study grant, loan and child supplement for 1, 2, 3, children, per month, in prices of 2007



Source (both figures): CSN (2007)

[8] Only the child supplement that was introduced in 2006 and is a grant given to the students is included here since the earlier child supplement was a loan.

3. Theoretical perspectives

As already indicated above, education and childbearing must be seen as dynamically interactive processes that mutually influence each other, and a number of features of the educational system, such as the structure and flexibility, have an impact on this relationship (Hoem et al. 2006). There are also several common determinants that may simultaneously have an influence on decisions about both education and family formation, such as preferences, values and attitudes, social class and parental resources, as well as individual abilities. Furthermore, the interplay between education and childbearing is shaped by, on the one hand relatively rigid institutional factors, such as the welfare state regime of a society, as well as by specific policies, for instance educational policy. On the other hand, this interplay is formed by cultural factors with deep historical roots, as well as by ideational factors (Billari and Philipov 2004).

The emergence of the welfare state has been described as one of the key factors behind the "institutionalisation" of the life course, and perhaps in particular of the transition to adulthood, including educational trajectories and the transition to first birth (Mayer and Müller 1986). Students' childbearing behaviour may therefore be seen as a way of coping with the current welfare mix (Vogel 2002).

The possibility to combine enrolment and childbearing varies greatly and is to a high extent related to the institutional structure. Billari and Philipov (2004) find that the negative effect of educational enrolment on childbearing risks is stronger in countries where the compatibility between the two acquires less support from either the welfare state or the family. As regards the impact of motherhood on educational enrolment Billari and Philipov find that in the Nordic countries, where family policy and publicly financed child care to a certain degree allow combining the roles of motherhood and student, becoming a mother actually lowers the risk of leaving education. In Sweden (where the impact is greatest) the risk is reduced by about 54%. In liberal welfare states, such as the United States and Britain, becoming a mother on the contrary has a tendency to lower educational attainment and cause the mother to drop out of school.

When investigating the effects of policy on childbearing behaviour it is essential to put the particular policy into a wider social, political, economic and normative context. This implies that not only do we have to take changes of society, politics, and in the market, over time into account, we also have to consider the groups the policies cover and how they are changing. Furthermore, we also need to bear eligibility regulations in mind since the existence of family policies does not necessarily mean that

everybody is entitled to them nor make use of them. Therefore, in order to measure the "factual" impact of policy on childbearing behaviour we need to examine the effect that the individual usage of a policy has on subsequent childbearing behaviour. Moreover, policy effects may be temporal and related to the economic cycles (Neyer and Andersson 2008).

The effect of family policy on fertility may be weakened if policies do not correspond to existing norms and the way that people want to live their lives. Existing incoherence between social development, normative development, and policy responses can have an inhibiting effect on fertility. Family policy signals which kind of behaviour is expected, or at least supported, and therefore reflect societal norms that they are to create or to maintain. Consequently, policy always acts on two levels, on the factual level as well as the level of "perception". It is therefore important to examine which normative goals a policy pursues (Neyer and Andersson 2008; Mc Donald 2000; Bordieu 1996).

The postponement of childbearing until after education could accordingly be seen both as a consequence of economic necessity and as a result of social norms regarding the "right" sequencing of life events. The factors are not necessarily in contradiction with each other; in Sweden for example, the parental leave system strongly reinforces the social norm that one should complete education and enter the labour market before having children at the same time as the parental leave legislation is influenced by societal norms.

Becker's classical theory on the impact of education on the transition to motherhood, the "New Home Economics", states that women with higher education are more economically independent of men and do therefore have less interest in marriage and will consequently postpone marriage as well as childbearing. In addition, the opportunity cost of time spent on childcare increases with human capital. Women's relative income (as compared to men's income) is therefore expected to have a negative effect on the demand for children (Becker 1981). This reasoning is in line with traditional economic models on optimal timing of motherhood which states that the opportunity cost of motherhood depends on the timing of motherhood and that the higher the woman's educational level the later is her transition to motherhood (Billari and Philipov 2004; Gustafsson 2001). Oppenheimer (1994) questions this view and argues that highly educated women in general find partners with high education as well, and due to pooling of resources, these women have economic incentives to enter a union and have children soon after finishing education.

When studying education and childbearing it is important to distinguish between achieved educational level and enrolment. Several scholars have emphasized the significance of educational enrolment rather than the achieved educational level as regards the transition to motherhood (Billari and Philipov 2004; Kravdal 1994; Blossfeld and Huinink 1991). Billari and Philipov (2004) show that completing education has a statistically significant effect on the transition to motherhood in all eleven Western European countries included in their study. Moreover, in all countries but France, Greece, and Austria, the effect of human capital is restricted to the completion of secondary education only, which leads them to the conclusion that once a control for the end of education is included, it cannot be stated that the higher the education the longer is the postponement of birth.

4. Data and methods

Given the complexity of family policies and the quantity of other political and socio-economic factors that has an impact on various areas of an individual's life, it is of course difficult to measure the true effect of a particular policy or event. To reduce the complexity, without eliminating the dynamics and interaction with other factors, it is necessary to focus on "critical junctures". A critical juncture is a point in time when a significant change occurs that is likely to have an effect on childbearing behaviour. It could be the introduction or elimination of a policy, or a major raise or drop in benefit levels. A critical juncture may also be a significant change in the institutional setting or socio-economic factors such as an economic crisis. These changes occur rather rapidly and can be relatively clearly marked in time. However, we still need to consider the time period prior to the critical juncture given that the development in childbearing behaviour after the change has to be assessed in relation to the situation before the change. Moreover, people may anticipate the change and adapt their behaviour accordingly (Neyer and Andersson 2008).

In our example, 1989 can be considered a critical juncture in terms of policy development, and we note that this juncture only applies to those enrolled as students. When it comes to the business cycle the recession in the early 1990s can be regarded as a critical juncture too. In order to explore whether these "critical junctures" have had an effect on childbearing behaviour we need longitudinal data that contain individual life-course behaviour and link it to relevant macro indicators (Neyer and Andersson 2008).

The data used in this paper are derived from the Swedish population register system. The same raw data set has previously been used in Anders-

son (2000). Our first step is to look at individual data on women. These include childbearing histories of all women born in Sweden 1945 or later which are linked to information about income, study activity and age. The *income* variable is based on earned taxable income the preceding year, with levels 0-59, 60-119, 120-179 and 180 or more, thousand Swedish kronor (in fixed prices as of 1995) and include income replacements during sickness and parental leave. The *student* variable shows whether or not an individual has received any kind of student financial aid (study grant and/or study loan). *Calendar year* is included as another variable with single-year periods from 1986 to 1996. For first births, *age* is a single-year variable. Since we know that first birth risks patterns differ considerably for younger and older women, ages 20-29 and 30-44 are estimated separately. As it is the interplay between enrolment in higher education and childbearing we are interested in, women below 20 are not considered.

For second and third births, age is given in groups of ages, from the category 20-22 years to that of 38-44.[9] For such births we also control for the additional effect of time since the previous births, i.e. *age of the youngest child* (with categories 0, 1, 1.5, 2, 2.5, 3, 4, 5, 6-7, and 8-9 years). Since Swedish registry data do not contain information about cohabitation status of individuals we have no information about earnings of any partner (or even the existence of such persons) unless they already have a child together. This means that we can only get a picture of a woman's own study activity and how this affects her childbearing. Therefore, the true effect of study activity on childbearing may partially be masked by such unobserved household characteristics (Andersson 2000).

However, as soon as a couple has a child in common, we can link them together and examine the couple's risk of higher order births. Our next step is therefore to look at couple's second and third birth risks. These data comes from Duvander and Andersson (2003). Our study population is defined to include all couples, with one or two children, that are registered on the same address.[10] Only couples where both are born in Sweden and the mother is between 19-42 years old are included. The couples are followed between 1984 and 1999 to see whether or not they have another child together, and data on childbearing is then linked to income and student status. Just as in our first data set *income* is here defined as earned taxable income the preceding year and includes income replacements during sickness and parental leave. The income variable is here divided into the

[9] This is to make the data more manageable.
[10] A second or third birth is here referring to the number of common children. However, if the man also has a child with another woman his total number of children can be higher.

following two categories: low and medium/high. By *low* income we refer to a yearly income of less than 125,000 SEK (about 12,500 €) and by *medium/ high* 125,001 SEK or more (in fixed prices as of 1995). We also control for the effect of *current age* of the woman,[11] *calendar year,* with single-year periods from 1984 to 1999, and *student status,* i.e. whether or not the individual has received any student financial aid.

To sum up, we study the effect of a number of variables on birth risks. We do this by estimating intensity-regression (or proportional-hazard) models. The observation window opens at the beginning of the observation period (1984) or when the woman turns 20, and closes either at the time of birth of a child, at age 44, in case of emigration or death, or at the end of the observation period (1999). For our couple data we also censor at union dissolution. Our estimates are computed by means of a computer programme called EvHA, developed at the Max Planck Institute for Demographic Research. Given the size of our data set, basically any estimated difference in risk level is statistically significant, for that reason we do not provide any figures on variances or significance levels.

5. Empirical evidence

5.1. Women's enrolment in higher education

Our data on exposure time of women in and out of education shows that enrolment in higher education increased in all age groups and among students with and without children during the 1990s. However, the economic crisis in the early 1990s clearly affected the youngest's propensity to enrol the most; among childless women age 20-24, the share being enrolled in higher education increased from about 20-30 percent the years preceding the crisis to more than 60 percent at the end of the decade (figure 8). The share of women with one or two children enrolled in education has increased as well, but the increase is more evenly spread out during the whole period and, just like among childless women in the older age groups (above 25), the increase in enrolment began later in the mid-1990s, when unemployment began to fall (figure 9-10).

The removal of the possibility to obtain an additional loan for students with children in 1989 does not seem to have affected mothers' willingness to study. However, we do not know whether more mothers would have chosen to enrol during the recession years if the additional loan had not been taken away. Seemingly, mothers' propensity to enrol in higher education was not directly affected by neither the recession nor the student

[11] Controlling for *age difference* did not affect the result significantly wherefore it is not included in the analysis.

aid reform in 1989. Still, the increase in enrolment among mothers is quite remarkable, among women under 30 with one child, the share being enrolled has increased from just above 5 percent in the early 1990s to more than 20 percent at the end of the decade. Among mothers with two children the share has increased from less than 5 percent to nearly 20 percent during the same period (figure 9-10).

Figure 8. Percentage of childless women enrolled in higher education in each age group, by calendar year

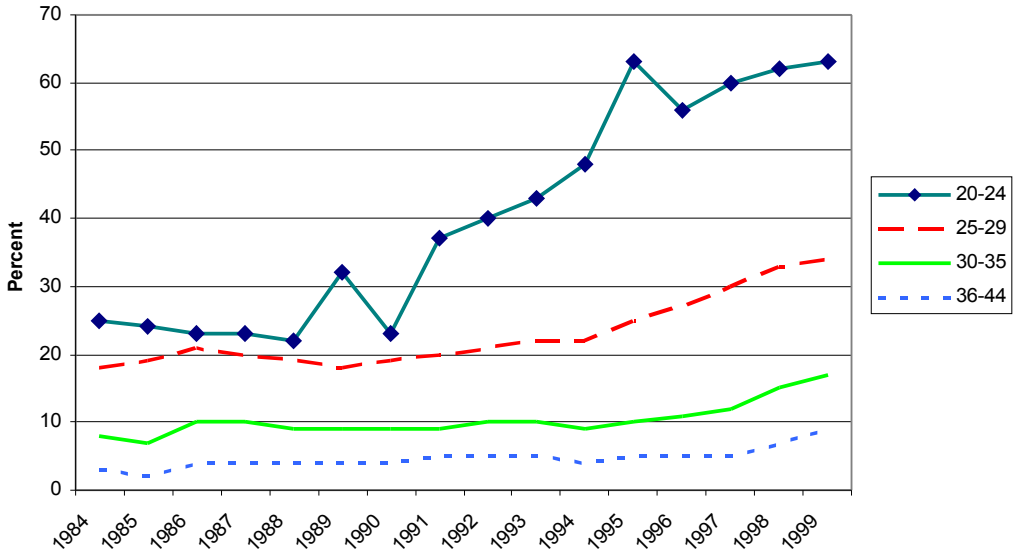


Figure 9. Percentage of women with one child enrolled in higher education in each age group, by calendar year

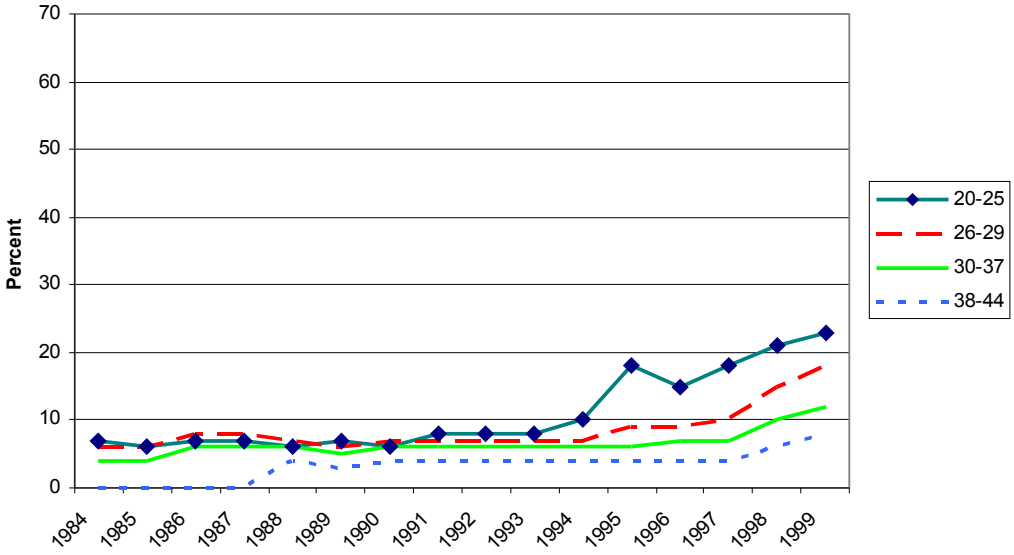
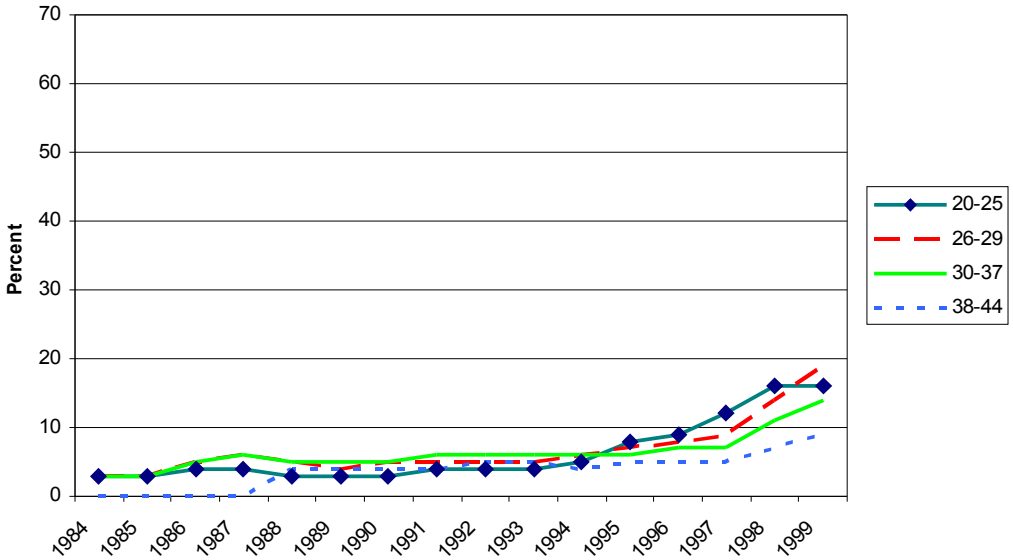


Figure 10. Percentage of women with two children enrolled in higher education in each age group, by calendar year



5.2. Women's first birth risks

Our empirical evidence reveals a slight decrease in first birth risks among students as compared to non-students between 1984 and 1999. However, the reform in 1989 did not have a noticeable impact on students' relative first birth risks. Among students in the youngest and the oldest cohort the trend in childbearing risks the years following the policy change is almost identical to the non-students, while the childbearing risks for students age 25-35 are declining slightly after 1989 as compared to non-students in the same age group (figure 11). Still, this decline started before the reform was implemented. We can also see that the relative first birth risk among students under age 30 declined during the recession in the early 1990s (figure 13), just like it did among the general population, while it remained stable during the same period among those above 30 (figure 15).

Adding the income variable gives us a somewhat different result when comparing first birth risks among students to non-students. This indicates that the financial situation does have an impact on students' childbearing decisions. When controlling for income, students above 30 shows about the same relative risk of giving birth as non-students (figure 16). Among students in the oldest age group 36-44, first birth risks are even slightly higher than for non-students in the same age group throughout the whole period (table 2).

However, the effect of adding the income variable is somewhat stronger among the younger cohorts, and this applies to both students and non-students. Possibly, most students above 36 have worked before entering education and are therefore entitled to the earnings-related parental insurance ("vilande SGI"). It is also likely that women in that age group have partners with a steady income. Another explanation may be that there is no time for further postponement of entry into motherhood for women in this age-group.

Figure 11. Relative first childbearing risks of students versus non-students, by age-group, standardized for single-year age (separate model for each age group). ***Not standardized for income***

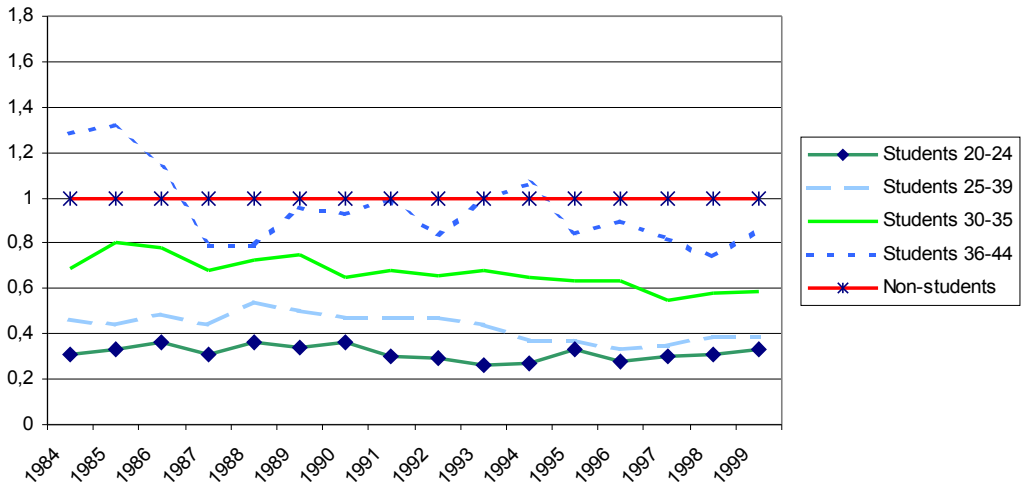


Figure 12. Relative first childbearing risks of students versus non-students, by age-group, standardized for single-year age (separate model for each age group). ***Standardized for income***

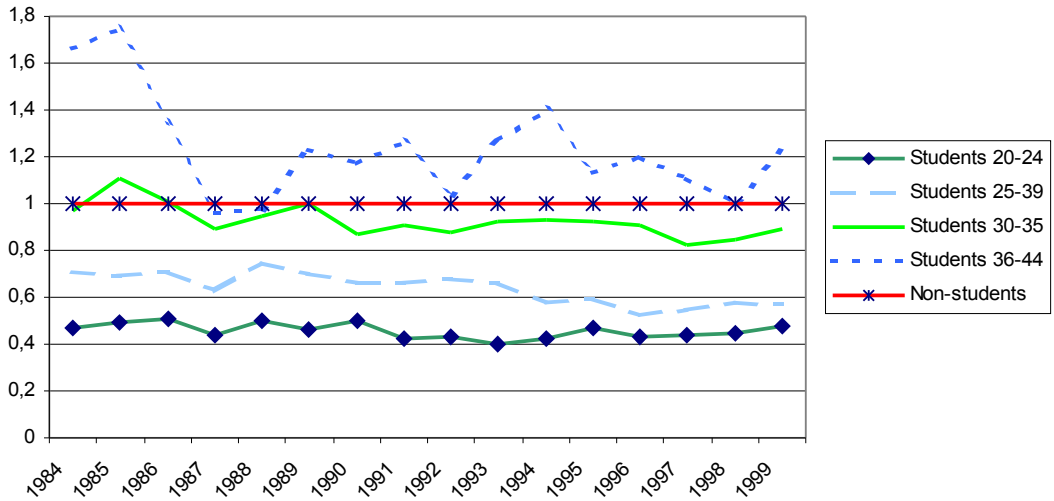


Figure 13. Relative first birth risks by student status and calendar year. Ages 20-29. ***Not standardized for income***

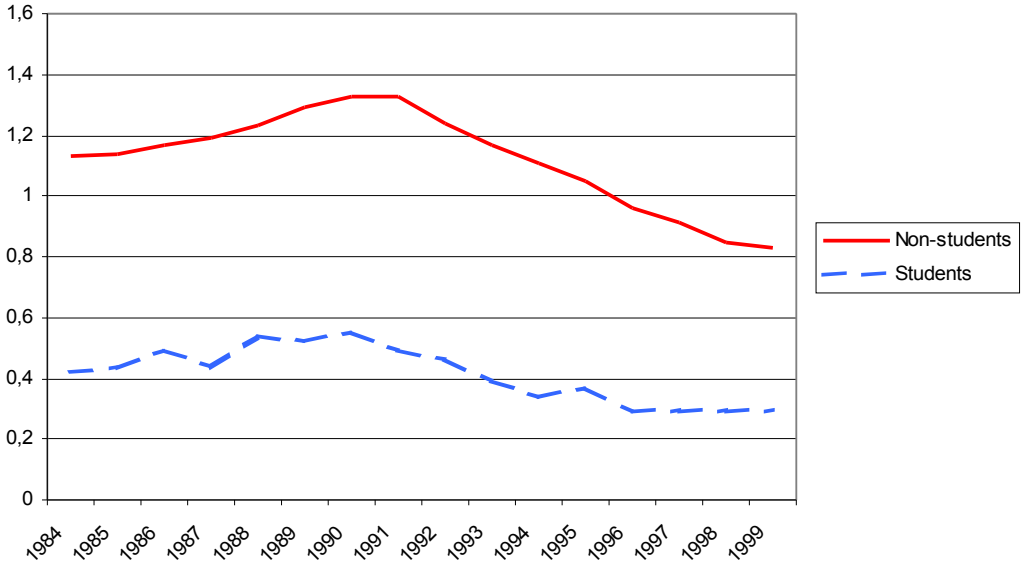


Figure 14. Relative first birth risks by student status and calendar year. Ages 20-29. ***Standardized for income***

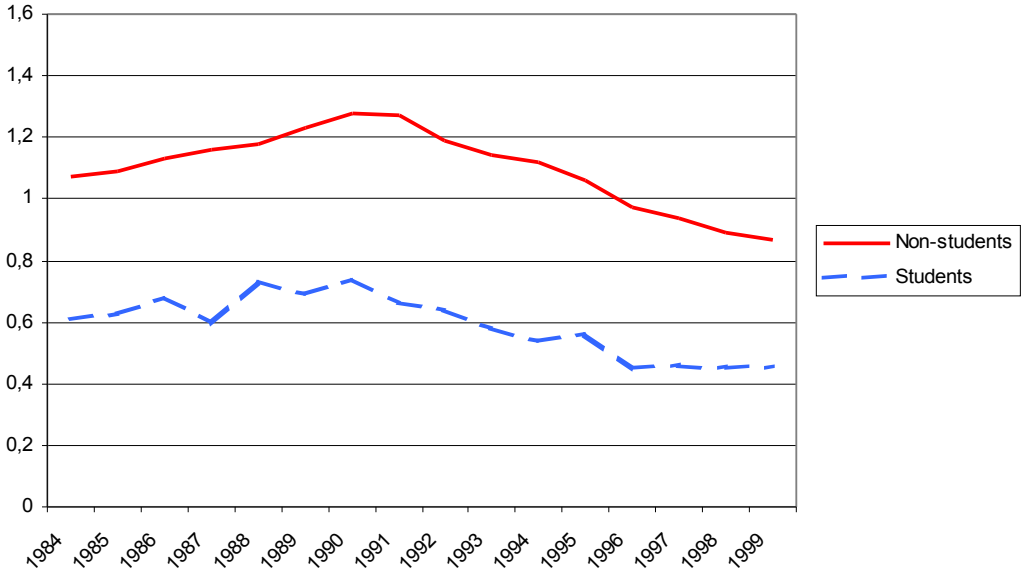


Figure 15. Relative first birth risks by student status and calendar year. Ages 30-44. ***Not standardized for income***

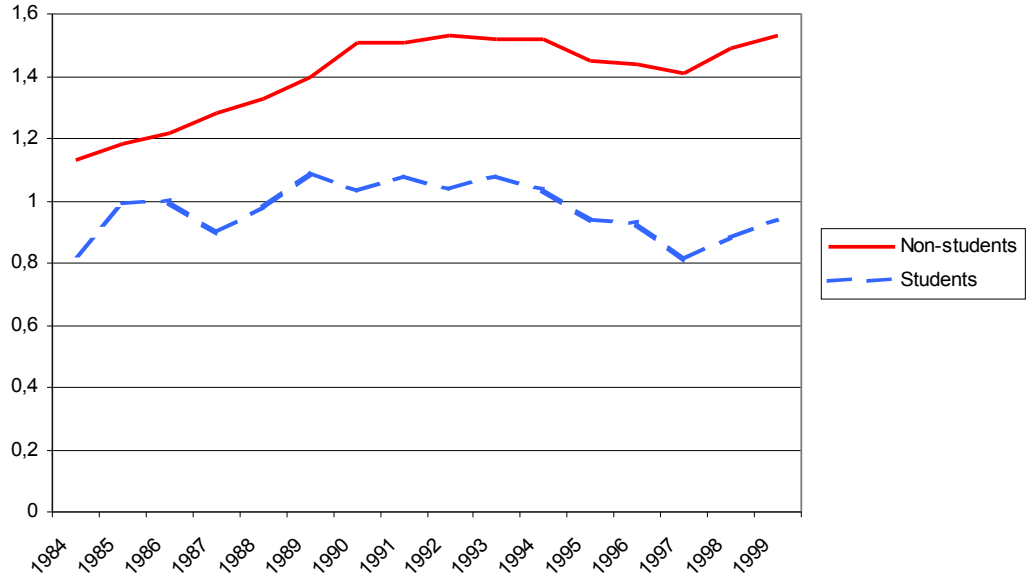


Figure 16. Relative first birth risks by student status and calendar year. Ages 30-44. ***Standardized for income***

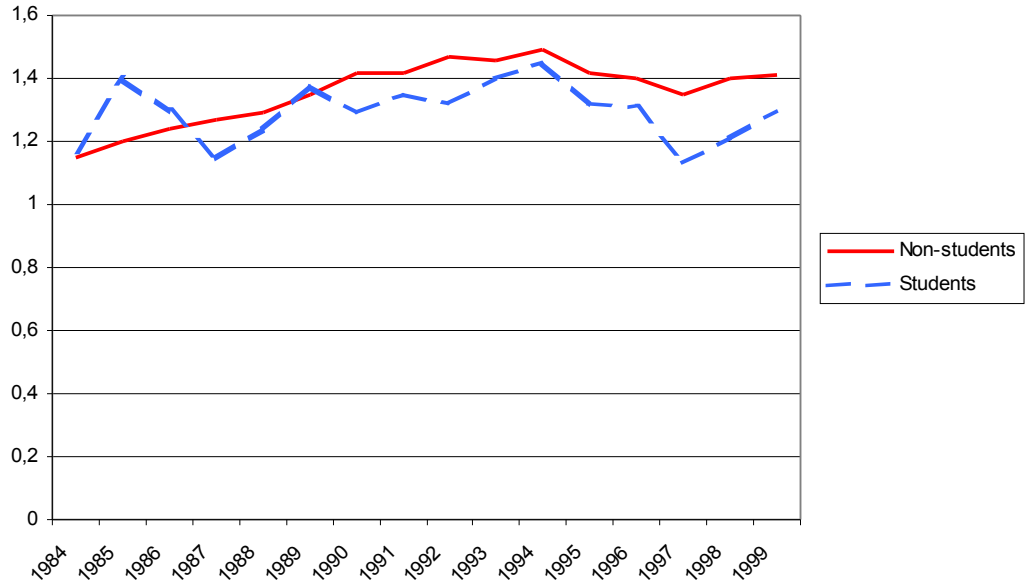


Table 1. Relative risk of first birth for students versus non-students, by age-group, standardized for the effect of calendar year and single-year age (separate model for each age group)

	20-24	25-29	30-35	36-44
Non-students	1	1	1	1
Students	0.31	0.43	0.65	0.90

Table 2. Relative risk of first birth for students versus non-students, by age-group, standardized for the effect of calendar year, single-year age and income (separate model for each age group)

	20-24	25-29	30-35	36-44
Non-students	1	1	1	1
Students	0.46	0.64	0.91	1.18

5.2. Women's second and third birth risks

Seemingly, the student aid reform in 1989 did not have a noticeable effect on neither second nor third birth risks among students, which remained quite stable as compared to birth risks among non-students throughout the period (see figure 17-20 below). Due to the recession second and third birth risks declined in the early 1990s just as it did among the population as a whole (figure not shown). This holds for all age groups and regardless of standardizing for income or not.

Unlike first birth risks, second and third birth risks are higher among non-students than students in all age groups, even when the income variable is added. However, the negative effect of being a student is much smaller on second and third birth risks than on first birth risks. Second and third birth risks among students are also much less affected by income than first birth risks, results that fit well with previous findings on childbearing risks at higher parities in Sweden (see e.g. Andersson 2000 and Hoem and Hoem 1989). This has sometimes been explained by the so-called speed premium, which means that for subsequent births parents have the right to keep the earlier level of income replacement for their parental insurance if the next child is born within a period of 30 months. Furthermore, the strong two-child norm implies that once the first child is born the second child follows more or less "automatically" and economic factors have a relatively weaker impact on second birth risks.

Figure 17. Relative second childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth. ***Not standardized for income***

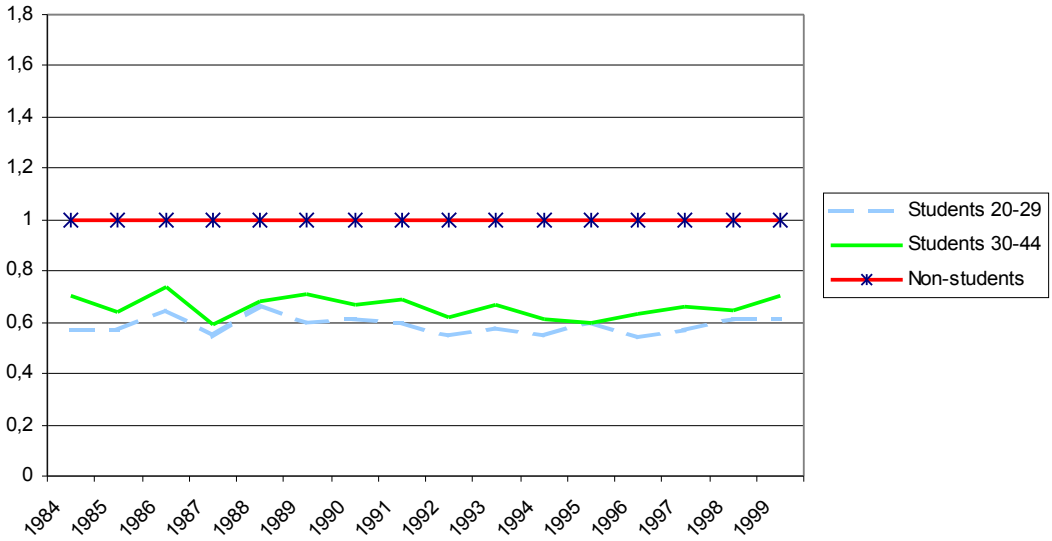


Figure 18. Relative second childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth. ***Standardized for income***

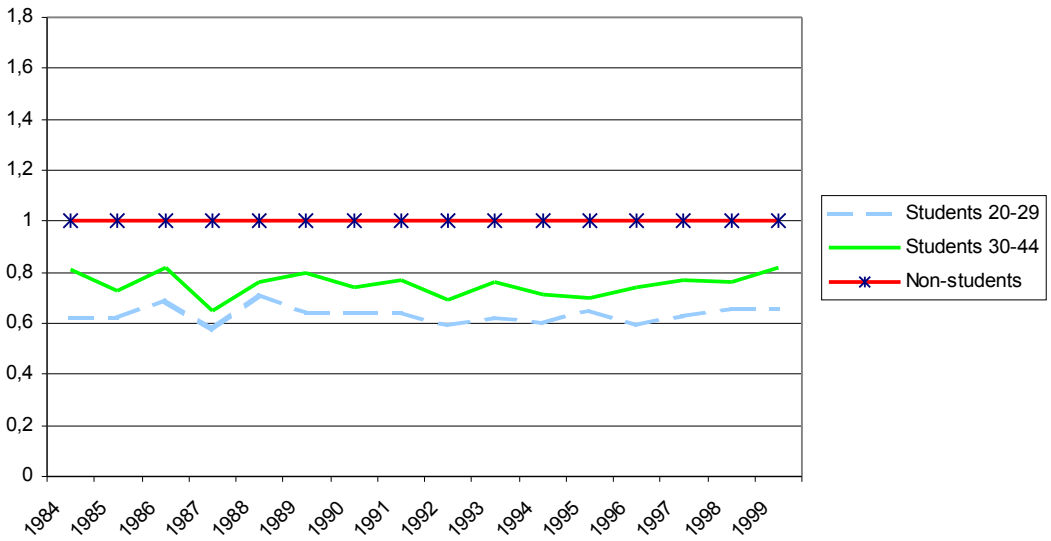


Figure 19. Relative third childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth. ***Not standardized for income***

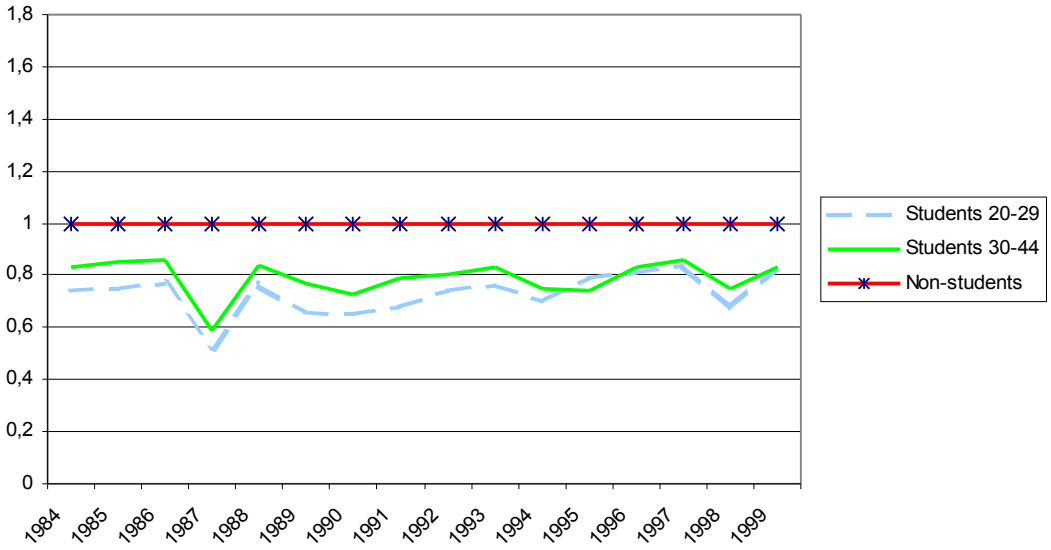


Figure 20. Relative third childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth. ***Standardized for income***

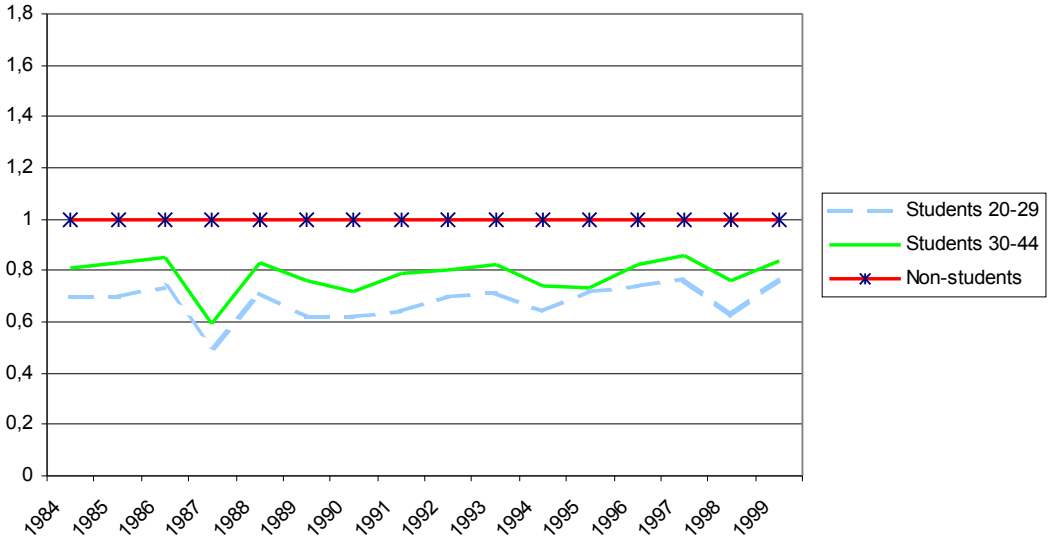


Table 3. Relative second childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth

	20-22	23-25	26-29	30-33	34-37	38-44
Non-students	1	1	1	1	1	1
Students	0.56	0.56	0.62	0.65	0.66	0.71

Table 4. Relative third childbearing risks of students versus non-students, by age-group, standardized for single-year age and time since previous birth

	20-22	23-25	26-29	30-33	34-37	38-44
Non-students	1	1	1	1	1	1
Students	0.62	0.62	0.68	0.71	0.72	0.78

5.4. Couple's second and third birth risks

Our couple data show that a couple where neither the mother nor the father is a student and both have medium/high incomes have, as expected, high second birth risks (table 5 and figure 21). More surprising is that a couple where the man is a student and the woman is a non-student shows an equally high birth risk, regardless of their income levels. The lowest risks are consistently found among couples where the woman is a student, and their fertility is only marginally higher if the father has a high income. Couples where both are students have roughly equally low risks as couples where only the woman is a student, which indicates that the student status of the mother is decisive.

Table 5. Relative risks of 2nd births for couples depending on income and student status, standardized for duration since previous birth, current age and calendar period (percent of exposure time within parenthesis)

	Both low income		Both medium/high income	
Woman student	0.62	(0.5%)	0.98	(0.3%)
Man student	1.13	(0.6%)	1.14	(0.4%)
Both students	0.69	(0.4%)	ns*	(0.0%)
None student	1	(42.5%)	1.17	(25.3%)

	Woman low/ man medium/high income		Man low/ woman medium/high income	
Woman student	0.73	(1.8%)	ns	(0.0%)
Man student	1.14	(0.4%)	1.17	(0.7%)
Both students	0.7	(0.1%)	ns	(0.0%)
None student	1.13	(23.9%)	1.06	(3.3%)

ns = not shown because of few observations.

When it comes to third birth risks the pattern is somewhat different (table 6 and figure 22). Also here, the lowest risks are found among couples where the woman is a student and the highest risks are found among couples where the man is a student and the woman is not. Interestingly, couples where the man is a student has an even higher third birth risk than couples where none of the parents is a student. Moreover, third-birth fertility is higher if the man has a low income than if he has a medium/high income, independent of the woman's earnings. This result is in line with previous studies on Scandinavia that show that men with a weak labour market attachment, such as low-income earners, students, welfare recipient, or non-participants, have the highest propensity to have a third child (see for example Andersson and Scott 2007).

Table 6. Relative risks of 3rd births for couples depending on income and student status, standardized for duration since previous birth, current age and calendar period (percent of exposure time within parenthesis)

	Both low income		Both medium/high income	
Woman student	0.66	(0.3%)	0.68	(0.4%)
Man student	1.15	(0.4%)	0.8	(0.4%)
Both students	0.77	(0.1%)	ns	(0.0%)
None student	1	(25.5%)	0.82	(28.7%)
	Woman low - man medium/high income		Man low - woman medium/high income	
Woman student	0.53	(2.3%)	ns	(0.0%)
Man student	0.86	(0.5%)	1.10	(0.4%)
Both students	0.62	(0.1%)	ns	(0.0%)
None student	0.79	(38.4%)	0.97	(2.6%)

Even though some of the curves presented below are irregular due to few exposures it is clear that the impact of the parents' student status on second and third births is stable over time. Couples who are non-students and couples where only the father is a student have the highest second and third birth risks while couples where the woman is a student, or both are students, have the lowest risks.

The student financial aid reform in 1989 does not seem to have affected couples' second and third birth risks negatively. On the contrary, second and third birth risks increased for all couples the period following 1989, non-students and students alike. The only exception to this is second-birth risks for couples where both are students, which decreased slightly. Third birth risks seem more sensitive to changes in the business cycle than second birth risks, this applies to students as well as non-students. However, among parental couples where the mother is a student both second and third birth risks appear to be less affected by the business cycle than among couples where none, or only the father, is a student as their fertility did not increase as much during the economic boom in the late 1980s, nor did it drop as sharp during the recession in the early 1990s.

Figure 21. Relative risk for a couple of having a second child by gender and student status over time, standardized for duration

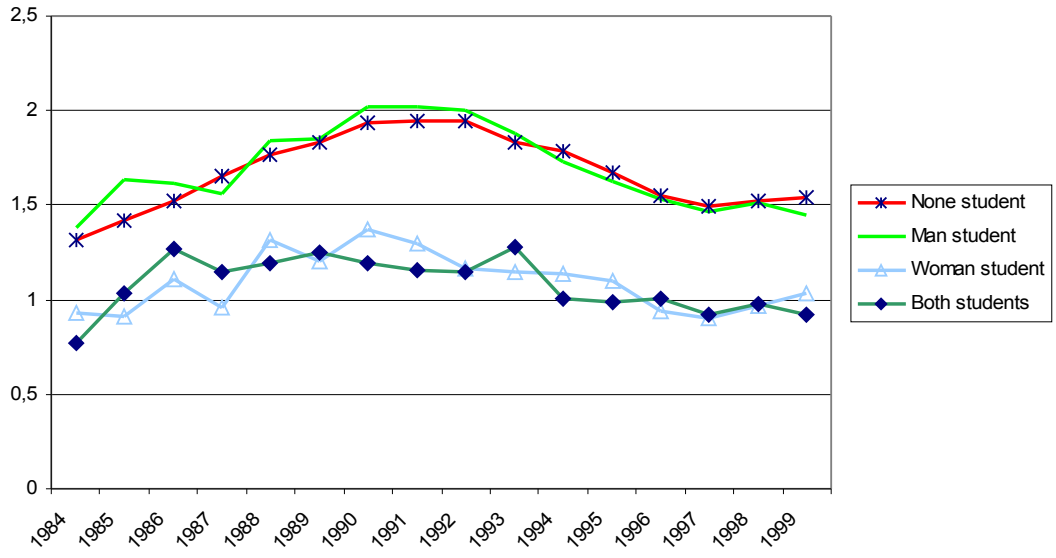
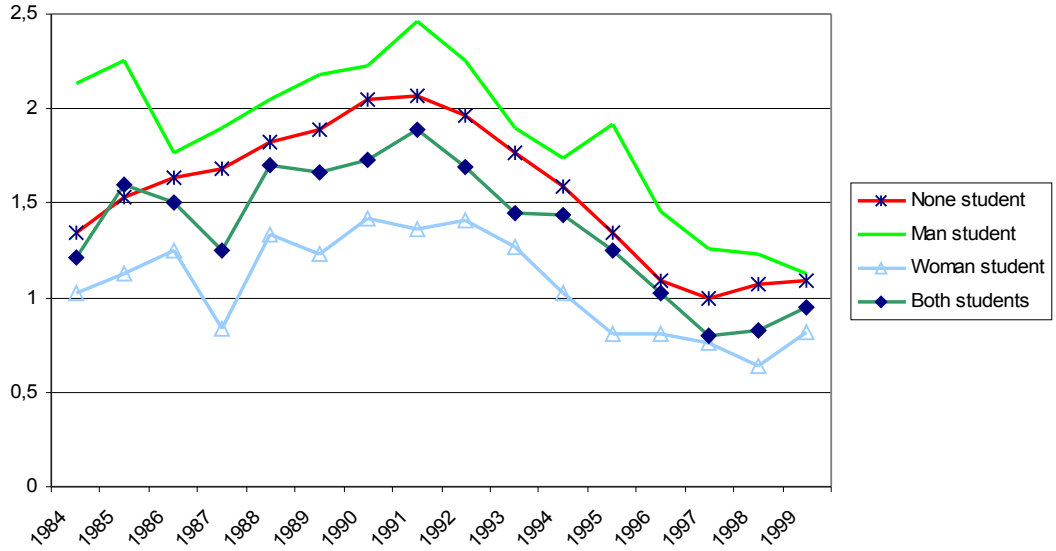


Figure 22. Relative risk for a couple of having a third child by gender and student status over time, standardized for current age and duration since previous birth



6. Concluding discussion

In this paper, we have shown that the student-benefit reform in 1989 apparently did not have a noticeable impact on student's childbearing behaviour. Nor does the propensity, among those who already had children, to enter or to continue education seem to have been affected by the reform. Another conclusion is that the recession in the early 1990s appeared to have affected students' childbearing risks in the same way as it affected the population in general. Hence, the economic crisis had a negative effect on birth risks at all parities but the decline is more marked for third birth risks than for second birth risks. Also the trend for first birth intensities among students is parallel to the general trend as the fertility decline during the recession is sharp among students under age 30 while first birth risks for students above 30 are much more stable during this period. Thus, the economic crisis had a negative effect on birth risks at all parities but did not affect the relative fertility of students vs. non-students.

In addition to these macro level changes, the massive inflow of students and the subsequent widening of the student population is another change that took place during the late 1980s and the 1990s. Despite this dramatic change, the "student effect" on childbearing behaviour has been relatively stable over time. This indicates that the low fertility of students is not a selection effect but rather something that can be related to the student status. The question of whether the student effect has to do with the low earnings of students or if it can be related to other factors leads us to our last question: What is the modifying effect of age and earnings on child-bearing risks? Our results show that birth risks among female students in all age-groups are clearly affected by income, which indicates that the postponement of childbearing until after finishing education, at least to some extent, is a matter of economic resources and not only about social norms about the "right" sequencing of life events. Furthermore, the propensity to become a mother, or to have another child, among female students also differs by age. The negative effect of being a student on birth risks is much stronger among the younger age groups. Also the modifying effect of income is strongest among students under 30. Most likely, students in the older age groups have worked before entering education and are therefore entitled to the earnings-related parental insurance. Another explanation may be that there is no time for further postponement of entry into motherhood for these women.

Our couple data showed that couples where neither of the parents is a student, and couples where only the father is a student, have the highest second and third birth risks, while couples where the mother is a student

have the lowest second and third birth risks. This pattern, where the father being a student has a positive impact and the mother being a student a negative impact on second and third fertility, is stable over time. This strongly gendered result raises several questions concerning women's and men's different roles in the family and on the labour market. Previous studies have shown that the woman's income is more important than the man's income for birth risks, which has been explained by the fact that mothers in general take the vast majority of the parental leave days. Before birth, her income is also more important as she is less flexible when it comes to the timing of her parental leave, which practically always begins at the birth of the child. Therefore it is much more detrimental to the households' economy if the mother is a student before the birth of the child than if the father is a student. Other studies have shown that men that are marginalized in the labour market have the highest third birth risks. One possible explanation is that these men – due to being unemployed or being a student – are more devoted to childrearing tasks and household work and that this somehow makes these couples more inclined to have more children. Another explanation may be that this is a selection effect and that these men are less career oriented and more family oriented from the outset. Yet another explanation could be that these fathers belong to a marginalized group of families that differs from other families in ways not considered here. What is clear however is that the results of this study, where the woman's student status is more significant for a couples' childbearing risk than the man's student status, show that the traditional male breadwinner model is weak or even non-existent in Sweden today. It also opposes Becker and the New Home Economics theory, where women's relative income is assumed to have a negative effect on the demand for children.

If the tendency that women take the major part of the parental leave days is what causes the difference in male and female students' childbearing risks, a solution to inhibit further postponement of childbearing would be to raise the minimum benefit of the parental insurance for students. This, in turn, would have positive medical and demographic effects. It could also be seen as beneficial for women, given that more women study and that women's fecundity decline more rapidly with advancing age compared to men's. On the individual level it would increase the choice capacity of students and enable them to combine studies with parenthood. Since students in general have more flexible working hours than employees this may be a favourable alternative for some students. Moreover, having children *before* entering the labour market means that childbearing will not

collide with the early intensive, and many times insecure, years as a new employee. It would also benefit the employers who will not have to deal with finding a substitute while the employee is on parental leave. On the negative side, raising the minimum benefit for students may weaken the dual earner model as well as the economic incentive for paid work. It may also extend young adults' educational period and delay their establishment on the labour market. As earnings-related benefits have been shown to be an important factor contributing to the relatively low levels of child poverty in Sweden (see for example Ferrarini 2003), raising the minimum benefit for students could also entail higher levels of child poverty.

To further investigate how student's childbearing behaviour is influenced by economic factors, data that separate students that are entitled to the earnings-related parental insurance from those who are not would be useful. For even deeper and more detailed knowledge about the sequencing of life events during the transition to adulthood, and why second and third birth risks differ so much between male and female students, we need qualitative data such as in-depth interviews. An additional question is why so many young adults, in particular women, choose to enrol in education *after* they had children. Did they work before they had a child to qualify for the income related parental insurance? Or do they find it easier to combine parenthood with studies than work? Or did having children somehow motivate them to (re)enter university? Here too additional qualitative research is needed to answer our questions. Yet another suggestion for future research is to look at a longer period in time and also investigate a possible effect of the child supplement introduced in 2006. Even though not being a very large amount of money, the existence of a child supplement for students as such is worthy of note, since it signals that society supports a sequencing of life events where childbearing precedes the ending of education.

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