

Determinants of Low Fertility in Post-Communist Estonia

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ABSTRACT

The former communist countries in Central and Eastern Europe experienced a sudden and substantial decline in fertility after the transition to market economy. This study investigates the impact of economic uncertainty, human capital characteristics and social support on the transition to first birth and the intention to have a first or second child in Estonia after the transition. Results show that higher educated women who participate in the labor market postpone childbirth after the transition, indicating that the opportunity costs of having a child have risen. Furthermore women in an uncertain labor market position (as indicated by a higher number of unemployment spells) have higher intentions to have a first child, which supports the hypothesis of uncertainty reduction that women choose the domestic role of housewife and mother as an alternative 'career' when labor market perspectives are bleak. Women who have one child already have lower fertility intentions when faced with an uncertain labor market position, this is also found for households with lower perceived income, couples where the male partner is not full-time employed and households with debts. Support received from the social network and especially so from friends has a positive effect on the intention to have a second child.

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INTRODUCTION

Virtually all Western countries have experienced a gradual but substantial drop in fertility in the last decades. In contrast, until the end of the 1980s, the communist regimes in Central and Eastern Europe exhibited stable fertility rates close to the replacement level of 2.1 children per woman, the level necessary to keep population size stable (UNECE, 1999). However, after the collapse of the communist political systems, fertility started to decline at an alarming rate and post-communist countries are now among the group with the lowest fertility in the world (Sobotka, 2004). Societies with declining populations face rapid ageing and shortages in labor supply which presents a serious challenge to governments and policy makers (Kohler et al., 2006). The interest in explaining the sudden fertility decline in the former communist countries of Central and Eastern Europe is therefore of scientific as well as societal relevance. This study attempts to disentangle the relationship between economic characteristics and fertility behavior in Estonia after the transition from communist to market economy.

Estonia is a particularly interesting case to study the decline in fertility for several reasons. First, Estonia showed a dramatic decline in fertility by 40% in the number of births in the first decade after the transition (Sobotka, 2002). Second, the transition was very radical and swift with Estonia going from being a Soviet republic to a democratic market economy with very liberal policies within a short period. In fact, it has been one of the most successful examples of a transformation from a planned to a market economy due to very liberal policies with regard to foreign investment, the dismantling of unprofitable state enterprises and a low level of state protection (Orazem and Vodopivec, 1999; Panagiotou, 2001). Furthermore, the small size of the country assures that within country differences are relatively small and policies were implemented simultaneously throughout the whole country.

Estonia has experienced a turbulent history in the 20th century; the short period of roughly twenty years of independence from 1919 to 1940 was followed by the subsequent occupation by Germany and the Soviet Union. After 47 years under communism, Estonia regained its independence in 1991. Living under

communism transformed the daily life of people in a profound way. Because many goods and services were not available on the free market, citizens depended on the state to receive for example housing and jobs. Receipt of these benefits was often tied to certain conditions, such as party membership for certain jobs or one's marital state and number of children in the case of housing (Hansson, 2001a). This system led to distinct demographic patterns, characterized by early marriage and childbearing, with very little variation of these life events in the population (Katus et al., 2005). Because of the constant shortage of workforce in communist economies, women were obliged to participate in the labor market, furthermore low wages made employment of both partners necessary to generate sufficient income for a family to survive. The dual-income two-child family represented the standard model in communist Estonia (Sobotka, 2002; Hansson, 2001b). After independence was regained in 1991, Estonia introduced democratic reforms and rapidly started to privatize the industry and decollectivized agriculture. This transition also brought about rapid differentiation of incomes, emerging unemployment and economic deterioration leading to a general sense of insecurity. But it also increased opportunities especially for certain groups such as the young and well educated (Hansson, 2001a). The demographic changes occurring together with the economic changes were just as profound. Fertility rates dropped sharply between 1991 and 1999 (see Figure 1). Along with this drop in fertility rates, marriage rates decreased and births out of wedlock showed a marked increase to levels comparable to or even higher than those common in Western Europe (in fact more than 50% of births are now out of wedlock in Estonia) (Sobotka, 2002).

Focusing on Estonia, the aim of this study is to gain more insight into the factors which led to the decline in fertility after the transition. The main research question is:

What is the impact of economic uncertainty, human capital characteristics and social support on fertility decisions in Estonia after the fall of communism?

Two types of fertility decisions are examined in this study, namely the duration from age 15 until first birth and the intention to have a second child within two years. The first fertility decision, the duration from age 15 to first birth, is used to examine whether the influence of human capital characteristics (the educational attainment and working status) on the timing of first childbirth has changed after the transition. This concerns a longitudinal analysis of women born between 1955 and 1984 which allows me to take into account the education and employment history of each woman from age 15 until first birth. The disadvantage of this approach is that the inclusion of information about the social support received by respondents and income of the household is not possible since these were only recorded at the moment of data collection. This information is used in the analysis of the intention to have a second child within two years as stated at the moment of data collection in 2003. This approach

hence allows testing of the influence of the changing economic and social conditions of the transition period on two different fertility decisions.

Since the fall of the iron curtain, numerous studies have dealt with the demographic changes in the post transitional economies of Central and Eastern Europe (e.g. Conrad et al., 1996; Sobotka, 2002; Philipov, 2004; UNECE, 1999; UNECE, 2001; Kattus et al., 2007). Yet most of these studies compared macro indicators of fertility behavior and economic indicators such as gross unemployment rates or economic growth in cross-country comparisons. Individual level analyses were only rarely applied and often cross-sectional in nature, thereby not allowing conclusions about causality (e.g. Philipov, 2002; Kohler, 2002; Bühler, 2004; Adler, 1997). In order to gain more insight in how the societal developments and changes in the period following transition from communism to market economy affected fertility behavior, I will apply event history techniques on retrospective life course data. This approach allows me to examine the causal relationships between social and economic changes and fertility outcomes.

This paper will proceed as follows. In the next section, previous findings and theoretical approaches on the fertility decline in post-communist societies are described and hypotheses are formulated. The data and methods are presented and finally the results are presented and discussed.

LOW FERTILITY: FINDINGS AND THEORETICAL APPROACHES

Until the end of the 1980s, the communist regimes in Central and Eastern Europe exhibited stable fertility rates around replacement level. This was caused by various pro-natalist population policies such as financial rewards for families with more children and general maternal leave programs (UNECE, 1999). After the collapse of the communist political systems, fertility started to decline at an alarming rate (Sobotka, 2002). The demographic developments in Estonia are no exception to this general post-communist pattern and show a remarkable decline in the number of births from the beginning of the 1990's onwards (see Figure 1). This decline can be partly attributed to an upward shift in the age pattern of fertility, often referred to as the postponement of childbirth, but is also the result of foregone births. Sobotka (2004) analyzed the influence of timing on period fertility in transition economies in the 1990s and found that in the case of Estonia the total fertility rate (TFR) adjusted for the postponement of births (1.77 children per woman) was considerably higher than the non-adjusted value of 1.28 children per woman.

Three main theoretical approaches have been proposed to explain the rapid fertility decline in post-communist countries (Philipov, 2004; UNECE, 1999). The first refers to change in social norms and values (ideational change). The second approach are theories pertaining to economic factors and uncertainty. The third concerns the influence of social networks on fertility. Due to the limited availability of data on change in norms and values, the hypothesis of ideational

change has not frequently been tested empirically. One application by Lesthaeghe and Surkyn (2002), examining attitudinal change in eight Western and twelve Central and Eastern European Countries, found evidence of higher tolerance towards new forms of living arrangements in the post-communist countries comparable to Western Europe. New aspirations and the rapid diffusion of individualistic values as indicated by the diversification of living arrangements and life patterns are seen as one of the driving forces behind the sudden decline in fertility levels in post-communist countries. Because in this study data on norms and values are not available, only the behavioral consequences of ideational change in the form of prolonged education and cohabitation are touched upon.

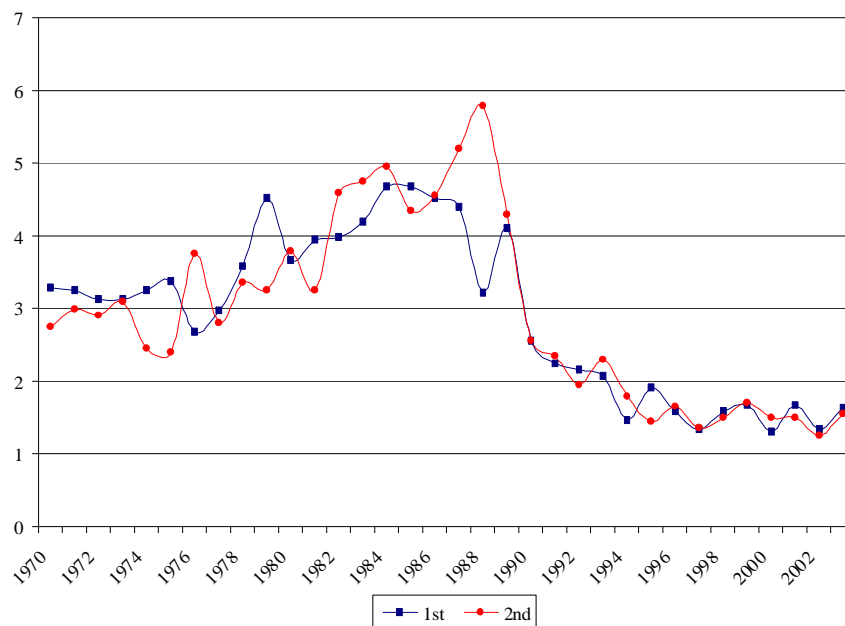


Figure 1: Children born to female respondents 1970 – 2003

Source: Estonian Social Survey N = 4876, calculations by author

The hypothesis that the sudden fertility decline in Central and Eastern Europe was caused by economic hardship and uncertainty has been proposed and tested frequently, but results are inconclusive. When macro-indicators of fertility and economic performance are analyzed, there appears to be a positive correlation between the decline in GDP and fertility, whereas micro-level analyzes produce differing results for different countries (Bühler, 2004; Kohler and Kohler, 2002; Huinink and Kreyenfeld, 2004; Philipov, 2002; Bühler and Fratzak, 2004). The most apparent problem with previous research seems to be that mostly cross-

sectional data was used, thereby not allowing any conclusion about the causality of events.

Bühler (2004) studied the effect of additional income generating activities on fertility intentions in Russia and found that households with lower perceived income were more likely to intend to have a first or second child and that households who engaged in additional income generating activities were more likely to intend to progress to a second child. In their analysis of Russian data, Kohler and Kohler (2002) found higher labor market uncertainty (measured as prevalence of unemployment and unpaid wages) to be positively associated with the birth of a child and fertility intentions. In the same study, concern about losing ones job and obtaining daily necessities were found to have a positive association with fertility intentions. In a study of the timing of first births in East Germany after unification, Huinink and Kreyenfeld (2004) found that unemployed women and those with a partner without secondary education have a higher first birth risk. In contrast, Philipov (2002) reports a significant positive effect of higher family income on the intention to have second child in Russia. In the same study, higher education is positively associated with fertility intentions in Bulgaria. A positive effect of husband's education and labor market participation of both spouses on fertility intentions is also found in Poland (Bühler and Fraczak, 2004).

From these previous studies it appears that there is not a universal relationship between high economic uncertainty and fertility. The divergent findings of previous research seem to stem from the different operationalisation of the key concepts of fertility and economic uncertainty. Furthermore, the hypothesized positive relationship between income and fertility is theoretically ambiguous. Two assumptions about how fertility decisions are guided by the economic situation of the household are made in this study. I first assume that fertility decisions are not only guided by the present income but also by potential future earnings. This implies that individuals who do not expect to achieve substantially higher wages in the future will not necessarily refrain from childbearing even under relatively uncertain conditions. I furthermore assume that individuals take into account not only the direct costs of children but also the indirect costs in the form of foregone earnings of, in particular, the mother. This implies that individuals with high earning potential face higher child bearing costs and might thus refrain from childbearing.

Opportunity Costs and First Birth Timing

The economic theory of fertility (Becker, 1991) emphasizes the changes in the costs of children as the determinant of fertility behavior. Children are assumed to be consumer goods and therefore compete with other household consumptions; this argument is especially relevant in the time of transition from a command to market economy where new consumption opportunities arose. Just as other goods, children provide utility to their parents but also require investments in both money and time. It is useful to distinguish between the direct and indirect costs of children; increases in the direct costs of children were caused by the

decline in affordable state-run care facilities and state benefits for families. In the first years after the transition, the prices of childcare increased and the number of facilities decreased by 14% (Orazem and Vodopivec, 1999). Indirect costs refer to raised opportunity costs due to the higher earning potential for young and well educated people caused by increasing income inequality. In a study of the effect of the economic transition on employment and wages in Estonia, Noorkoiv and colleagues (1997) found that the returns to education increased rapidly during the first five years of independence, with wage gains as high as 75% for the highest educated compared to the least skilled workers. This increase in the returns to education occurred over all sectors and all age groups. The same accounts for the returns to experience, although it has to be noted that the youngest cohorts in the labor market gained relatively more because their wages were rising sharply at the beginning of their career (Noorkoiv et al., 1997). Furthermore, the economic model of fertility assumes differing effects of changes in male and female income on fertility decisions. Because it is usually the woman who engages in rearing children, her opportunities for labor market participation are constrained by having a child. For this reason, higher male wages are assumed to have a positive association with fertility, while an increase in earning potential in female wages might depress fertility because of the higher opportunity costs of rearing a child. Female labor force participation had been very high under communism and even though the employment share of women fell slightly from 51% in 1989 to 48% in 1994, they gained in wages relative to men because women were overrepresented in the higher educated parts of the population (Noorkoiv et al., 1997). This implies that especially those women holding high human capital had good prospects in the labor market.

When direct and indirect costs of children are considered together with the new consumption opportunities in Estonia in the 1990s, the following hypothesis can be derived:

Opportunity cost hypothesis (H1):

Because the opportunity costs of childbearing for women with high educational attainment (high human capital) rose due to increasing income differentiation, high human capital will be associated with a slower transition to first birth after the transition.

As stated in the hypothesis, the examination of the influence of human capital on first birth timing is conducted for female respondents only. This is in line with the theoretical argument that women invest more time in rearing children and therefore are more affected in their opportunity to participate in paid labor. It is expected that this argument does not hold for women who experienced their first birth before the transition because the combination of paid work and family responsibilities was facilitated by various policies such as generous maternity leave programs and free child care facilities. Furthermore the incentive to invest in human capital was absent because income differences were small.

Economic Crisis versus Uncertainty Reduction

Besides the change in the direct and indirect costs of children, the evaluation of stability of future earnings is an important factor which influences fertility behavior (Mills et al., 2005). The rise in unemployment, high inflation and the drastically reduced state support in the first years after the transition created a high degree of uncertainty in large parts of the population. In the situation of unpredictability of the future, irreversible life events such as marriage and childbirth are postponed (Philipov, 2002). The rise in uncertainty might have had a direct effect on the decision to have a first child for those couples who experienced unemployment and impoverishment without having the possibility to improve their perspectives for the future through education or other forms of training. This refers primarily to the least skilled, who faced a particularly difficult labor market situation. Employment in agriculture and manufacturing, where most of the low skill jobs were located, fell by 45% and 25% respectively. The employment share of the least skilled fell in every sector during the first five years after the transition, an indication that the employed labor force demands became substantially more skill-intensive (Noorkoiv et al., 1997).

Estonia introduced very low levels of state support, the replacement rate of unemployment benefits was 10% and employment protection legislation was very weak (Noorkoiv et al., 1997). Therefore unemployment posed a serious financial threat. A rational response to these conditions for the group of lower skilled workers is the postponement of children. However, the relation between economic uncertainty and fertility might not be as clear-cut. The economic position of the male partner might have a different impact on fertility decisions than the position of the female partner. The male income is generally seen as the main provider for the family and various studies have confirmed that labor market insecurities of young males lead to delayed marriage timing and childbirth in market economies (Tölke and Diewald, 2003; Oppenheimer, 1988). This mechanism might be reversed when the female labor market position is considered. According to Friedman et al. (1994) children can serve as means of uncertainty reduction. By assuming that the reduction of uncertainty is a universal value, having a child can be a rational response to uncertainty about the future. This strategy is most likely to be chosen by individuals for whom alternative ways of reducing uncertainty are blocked (Friedman et al., 1994). In the context of the post-transition period in Estonian, for women with bleak labor market perspectives, having a child offers the opportunity to take on the role of being a housewife and mother as an alternative to paid employment (Mills et al., 2005). This argument is especially relevant since during communism women were expected to participate in paid employment while at the same time having the main responsibility for childrearing and household duties (Hansson, 2001b). Thus even though the official policy under the communistic regime prescribed gender equality in all areas of society, roles within the household remained traditional. Taking into account both arguments, differing effects of economic uncertainty for men and women are expected. When the male partner is in an

uncertain labor market position as indicated by a high number of job changes and unemployment spells, a negative effect on fertility intentions is expected. On the other hand, when women are in an uncertain labor market position, this might lead them to opt for parenthood as a strategy to reduce uncertainty by becoming a mother and housewife. Derived from these theoretical considerations, two hypotheses are formulated:

Economic crisis hypothesis (H2a):

Couples who evaluate their personal economic situation negatively or where the man is in an uncertain labor market position will have lower intentions to have a child.

Uncertainty reduction hypothesis (H2b):

Couples where the woman is in an uncertain labor market position will have higher intentions to have a child.

Social Support and Fertility Intentions

The second theoretical approach to be discussed here refers to the importance of social networks. In previous research, generally a positive effect of social support on fertility has been found. Using data on Poland from 2001, a positive effect of the size of a supportive social network and reciprocal relationships of both kin and non-kin on fertility intentions has been found (Bühler and Fraczak, 2004). In their analysis of fertility intentions in Bulgaria in 2002, Bühler and Dimitrov (2005) found higher fertility intentions in couples with more access to non-monetary help, while monetary help and small help received did not influence fertility intentions.

During the period of communism, inefficiencies in the system of distribution and scarcity of consumption goods forced people in Estonia to rely on their personal contacts to achieve certain ends (Narusk and Hansson, 1999, Bühler and Fraczak, 2004). The transition to the market economy solved the problems of availability of products, but at the same time large parts of the population lacked the financial resources to make use of these new opportunities. Furthermore the state no longer provided monetary or non-monetary support to all citizens. Instead social benefits were means tested and reduced to a minimum. In this situation, the personal networks of people are important sources of support and the existence of a resourceful social network provides the necessary security to start a family or have another child (Narusk and Hansson, 1999, Hansson, 2001a). This leads to the third hypothesis:

Social support hypothesis (H3):

Under uncertain conditions, support received from the social network is a crucial resource which reduces perceived uncertainty. It is therefore expected that having received support from friends or family will lead to higher intentions to have a child.

Behavior versus Intentions

In this study, behavior and intentions are used as dependent variables. This strategy is chosen because of substantial as well as methodological reasons. While the transition to first birth concerns actual behavior and is therefore a direct measurement of fertility, other important fertility outcomes such as natural and induced abortions are ignored. This might lead to biased estimates, especially in the context of Estonia, where the incidence of induced abortions has been relatively high, with abortion rates varying between 0.75 and 1.5 (Katus et al. 2000). However, because it has been found that fertility levels were largely unaffected by abortion rates, it can be assumed that induced abortions replaced other means of fertility regulation (Katus et al. 2000). This conclusion is also in line with the decreasing number of abortions in the last decade due to better availability of modern contraceptives after the transition. Still one has to bear in mind the fact that all pregnancy outcomes other than the birth of a child are not taken into account in the analysis of first birth timing.

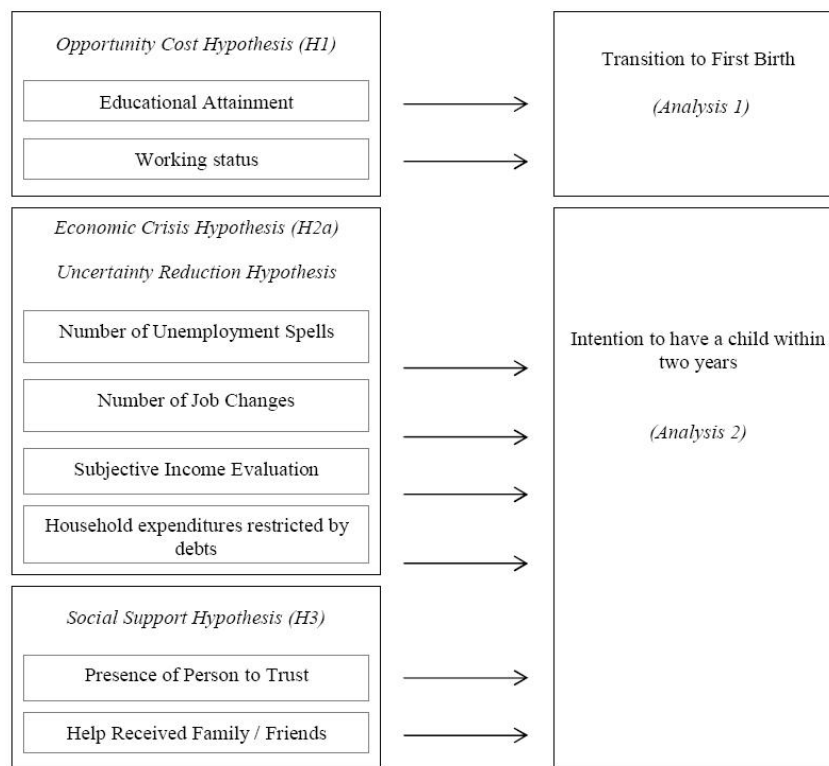


Figure 2: Analytical model

Source: Own illustration

Furthermore, using event history techniques for the analysis of durations does not allow the inclusion of cross-sectional information which refers to the moment of data collection, such as information about the partner of female respondents (partners living with the respondent at the time of the interview are not necessarily the father of the first child) and information about the social support received (which is asked for the last calendar year). Therefore limiting the present study to the analysis of actual behavior would narrow the theoretical scope of this study severely. An additional argument for also including intentions as an indicator of fertility decisions is that fertility intentions have been found to predict fertility behavior accurately, at least when the intention to have a(nother) child within the next future is concerned (Schoen and Astone, 1999; Thomson, 1997; Mills and Begall, 2008). Because previous research has shown that the decision to have a first child differs from the intention to have a second child in countries with a strong two-child norm such as Estonia (Bühler and Fratzak, 2004; Bühler, 2004; Philipov, 2002), all analyses are run separately for women and couples who have one child (intention to have a second child) and women without children (intention to have the first child). The analytical model is presented in Figure 2.

DATA AND METHODS

The data used in this analysis come from the Estonian Social Survey (ESU), which was administered in 2004 as part of the European Union Statistics on Income and Living Conditions (EU-SILC) aiming at collecting comparable cross-sectional and longitudinal multidimensional micro data on income poverty and social exclusion (EUROSTAT, 2007). A national sample of households was selected consisting of 3,993 households with 8,906 individual respondents. Data were collected at the household level and at the individual level. Information on health, access to health care, detailed labor information, activity history and calendar of activities were collected at the individual level. Furthermore, information on household size and composition, education, basic labor information and second job were collected for all household members (EUROSTAT, 2007).

Dependent Variables

In the first analysis, the risk of first birth is examined using event history techniques. The dependent variable is the duration from age 15 to first conception in months. The date of conception is calculated by subtracting nine months from the date of first birth. The rationale behind using first conception rather than first birth is to avoid reversed causality with regard to the effect of employment status of the respondent since women tend to withdraw from the labor market during the first period after having a child.¹ For respondents who did not have a first child, the period under observation ends at age 40 or the

interview date, whichever occurred first. This is a common strategy in analyses of fertility and in this sample no respondent experienced a first birth after the age of 40 (Blossfeld and Mills 2001). Respondents who did not experience a first birth during the time under study are referred to as censored cases. The sample used consists of all women in the dataset born between 1955 and 1985. Out of these 2,466 women, 73% have at least one child.

In the second analysis, a logistic regression was conducted to examine the association between the intention to have a child, the human capital of the respondent, the economic situation of the household and social support. The dependent variable, fertility intentions, was measured by the question of whether the respondent plans to have a child within the next two years (0= no, 1= yes) at the time of the interview in 2003. For this analysis of fertility intentions, different sub-samples were used consisting of female respondents aged 20 to 44. The age of respondents was limited to 44 because women are very unlikely to intend to have a child above that age (no respondent above 44 was found to intend a child in this dataset). Fertility intentions were examined in three groups of respondents. Women without children (N=434), with one child (N=451) and with one child and co-residing with their partner who was also interviewed (N=267). In the analysis of women co-residing with their partner, information about educational attainment and labor market participation of the partner are included in the model.

Explanatory variables

The explanatory variables used in the analysis of the transition to first birth are discussed first, followed by a description of the explanatory variables used in the analysis of fertility intentions. Descriptive statistics and frequencies of all variables used are presented in the appendix.

In order to capture the causal relationship between human capital and first birth risk, employment status and participation in the educational system are included as time-varying covariates. For each respondent, employment status and educational participation at each point of analysis time are assessed. Human capital of the respondents is measured as the highest educational attainment and working status. Educational attainment is measured on a five point scale (0 = no primary to 5 = higher professional/tertiary). Working status was included as a time-varying covariate indicating periods of being in a paid job versus periods of not working. Furthermore, a time varying indicator of educational participation is included. The effect of the transition period was tested by a dummy variable indicating whether the birth of the first child occurred between 1991 and 2001. In order to test the hypothesis that higher human capital is associated with higher opportunity costs in the period after the transition, interaction terms of educational attainment and working status and educational attainment and working status in the period 1991-1998 are included. Additionally, marital status, birth cohort and ethnicity of the respondents are included as control variables. The marital status of respondent was included as a time-varying covariate.

Possible differences between the Estonian and Russian part of population are controlled by a dummy variable indicating whether the respondent is a native speaker of Estonian.

In the second analysis, fertility intentions are predicted by the human capital of the respondent, the economic situation of the household and social support. The economic situation of the household was measured by an evaluation of how well the household copes with the current monthly net income (1 = we do not cope at all to 6 = we cope very well). This subjective rather than an objective measure such as income quintiles is chosen because the costs of living differ greatly between the larger cities (and especially the capital Tallinn) and the countryside and therefore a certain income does not necessarily represent the same standard of living. Additional information on whether the household expenditure is restricted by paying back debts is included.

The human capital and labor market position of the respondent is measured by current work status (coded 1 if full-time employed, 0 if part-time employed or inactive), the total number of job changes, the number of unemployment spells longer than 6 months the respondent experienced and education (0 = no primary to 5 = higher professional/tertiary).

When partner characteristics are included in the analysis, educational attainment, current working status, number of job changes and unemployment spells are included for the partner as well (measured as described above).

The support of the social network is measured by the presence of a person whom the respondent can trust completely (1 = yes, 0 = no) and whether the respondent received help with various activities (e.g., housework, babysitting, running errands, transport) from family or friends in the past calendar year. Furthermore, age, marital status, whether the mother tongue of respondent is Estonian are included as control variables.

Analyses

In the first analysis of the transition to first birth, a piecewise constant exponential model is used. The advantage of this model is that the risk of experiencing an event is not assumed to be constant over time, but is allowed to vary between specified intervals. Also this technique allows the inclusion of time-varying covariates (Blossfeld et al., 2007). The baseline risk of first birth is estimated for different age groups in order to take into account the fact that the risk of having a first child is not constant over time. The age groups are defined at 15-16, 17-18, 19, 20, 21, 22, 23, 24-25 and 26-40 years, the baseline risk is allowed to vary within age groups but is assumed to be constant within groups. In the first model, only the dummy variables representing the different age groups are included. In the second model, birth cohort, educational attainment, ethnicity, marital status, educational participation, working status, a dummy variable indicating whether the birth of the first child occurred between 1991 and 2001 and an interaction term of educational attainment and working status are

included. In the third model, an interaction term of educational attainment, working status and historical period was added (see Table 1 for results).

In the second analysis, a logistic regression was conducted to examine the association between the intention to have another child, the human capital of the respondent, social support received and the economic situation of the household for couples and women with one child and women without children.

RESULTS

The results of the analysis of transition to first birth are discussed first. The results of model 1 in Table 1 show how the relative risk of first birth varies between the different age groups. The second model shows the results of all explanatory variables, the third model includes an additional interaction effect. Compared to women without a partner or not co-residing with their partner, married and cohabiting women have a significantly higher risk of first birth. Not being a native speaker of Estonian is associated with a lower risk of first birth, the same accounts for women while they are participating in the educational system. This has been termed the institutional incompatibility of participating in the educational system and starting a family and has been found in various institutional contexts (Liefbroer and Corijn, 1999; Blossfeld and Huinink, 1991). Compared to the reference cohort of women born between 1955 and 1964 those who were born a decade later (1965-1974) experience their first birth earlier, while the youngest cohort has a significantly lower first birth risk. This effect mirrors the pro-natalist policies in the Soviet Union during the 1970s and 1980s and the subsequent drop in fertility after the dissolution of the communist system.

Higher educational attainment is associated with a lower risk of first birth, even when the timing of educational participation are controlled for. This is associated with the longer time spent in the educational system to attain a higher degree (see effect of being in education). Being in paid work has no effect on the transition to first birth, which is due to the fact that before the transition, participation in the labor market was practically obligatory for all women and the combination of paid work and family responsibilities was facilitated by free childcare (Sobotka, 2002).

To test whether women with higher human capital faced higher opportunity costs throughout the period under observation, an interaction term of educational attainment and participation in paid work was included, but the effect of this interaction is not significant. Finally, a dummy variable indicating whether the first birth occurred during the first decade after the transition is added. This effect is significant and negative as expected, showing that the risk of first birth decreased after the transition. In the third model, an additional interaction term of educational attainment and working status by the indicator of historical period 1991-2001 was added to test the opportunity cost hypothesis (H1) which states that high human capital is associated with a slower transition to first birth after

the transition. This expectation is supported by the data. The effect of the interaction term is significant and negative, indicating that among the women in paid employment, the higher educated progressed slower to a first birth after the transition. This result is in line with previous research on the influence of education on fertility in the Czech republic during state socialism and after the transition (Kantorová, 2004).

Table 1: Results piecewise constant exponential model of duration to first birth

	Women born 1955- 1984		
	Model 1	Model 2	Model 3
Age			
15-16	-3.27***	-1.90***	-1.94***
17-18	-1.64***	-.379**	-.427***
19	-.563***	Ref	Ref
20	-.125	.605***	.542***
21	.21**	.772***	.712***
22	.36***	.78***	.714***
23	.542***	.796***	.731***
24-25	.396***	.566***	.508***
26-40	.449***	.47***	.408***
Marital status			
Single		ref	ref
Cohabiting		.944***	.942***
Married		1.24***	1.21***
Separated		.243	.217
Cohort 1955-1964		ref	ref
Cohort 1965-1974		.165***	.171***
Cohort 1975-1984		-.396***	-.367***
Ethnic Estonian (ref = yes)		-.150***	-.157***
In education (ref = not in education)		-.968***	-.96***
Educational attainment		-.064*	-.058
Working Status (ref = not working)		-.108	-.08
Educational attainment * Working status		.052	.104**
Historical period 1991-2001		-.151**	.433***
Historical period 1991-2001*Educational attainment* Working status			-.227***
Constant	-4.58***	-4.64***	-4.76***
Log Likelihood	-2014.94	-1502.68	-1475.09
N	2466	2466	2466

Source: ESS (own calculations)

Notes:

P-values: * $p \leq 0.1$; ** $p \leq 0.05$; *** $p \leq 0.01$

Moving from behavior to intentions, the results of the logistic regression analysis are discussed next. Three analyses of different subsamples are conducted. The first sample consists of all women aged 20-44 with one child of whom the husband or partner was also interviewed (N=267). The second sample consists of all women aged 20-44 who have one child regardless of their marital status (N=449) and the third sample consists of all women aged 20-44 without children regardless of their marital status (N=433). Due to the small number of cohabiting or married couples without children in the sample (N=75), taking into account partner information for women without children is not possible. Results for all samples are presented in Table 2. The first model includes age, marital status, ethnicity, highest educational attainment, employment status, the number of unemployment spells and the number of job changes. In the sample including partner information, the educational attainment and labor market experience of the partner are added in the next step. In the second model, the social support measures are included and the final and third model also contains information about the economic situation of the household.

First, the control variables age, marital status and ethnicity are discussed. Compared to the reference category of women aged 20-24, women older than 34 are less likely to intend a second child. While no differences between the other age groups and the reference category are found for respondents with one child, women without children aged 25-29 are more likely to intend to have a first child within two years than the youngest reference group of 20-24. The marital status of respondents is, as expected a strong predictor of fertility intentions. Women who do not co-reside with their partner or are single are less likely to intend a first or second child. There is however no difference in fertility intentions between cohabiting or married couples in the sample including partner information. This reflects the fact that more than 50% of children in Estonia nowadays are born to parents who are not married (Hansson 2001b). Whether the respondent is a native speaker of Estonian, which is a proxy for ethnicity of the respondent, does not predict fertility intentions. The educational attainment of respondents only predicts the intention to have a first child. Higher educational attainment is positively associated with the intention to have a first child within two years.

Moving to labor market experience, again differing effects for women who have one child already and women without children are found. A higher number of unemployment spells lasting longer than six months is negatively associated with the intention to have a second child but surprisingly, no effect of the number of unemployment spells of the male partner is found. When women without children are examined, a positive association of labor market uncertainty with the intention to have a first child is found. This is in line with the hypothesis of uncertainty reduction (H2b), which states that women in uncertain labor market positions might choose the role of mother in order to reduce future uncertainty. Once a child is born however, the intention to have a second child might be impeded by labor market uncertainty.

Table 2: Results logistic regression of fertility intentions

	Women 20-44, one child with partner characteristics				Women 20-44, one child without partner characteristics				Women 20-44, no children without partner characteristics						
	Model		Model		Model		Model		Model		Model		Model		
	1	2	3	4	1	2	3	4	1	2	3	1	2	3	
Age															
20-24 (ref)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25-29	1.86	1.45	1.42	1.52	1.01	1.02	.99	1.02	2.42**	2.57**	2.1*	2.1*	2.57**	2.1*	2.1*
30-34	2.7	1.97	2.04	2.28	1.49	1.57	1.73	1.49	1.88	2.14	1.78	1.88	2.14	1.78	1.78
35-39	.07***	.02***	.02***	.01***	.13***	.13***	.12***	.13***	1.42	1.54	1.29	1.42	1.54	1.29	1.29
40-44	.07***	.03***	.04***	.02***	.04***	.05***	.04***	.04***	.31	.37	.25	.31	.37	.25	.25
Marital status															
Single	n.a.	n.a.	n.a.	n.a.	1	1	1	1	1	1	1	1	1	1	1
Cohabiting	1	1	1	1	5.07**	4.81**	4.42**	4.81**	7.38**	7.53**	9.76**	7.38**	7.53**	9.76**	9.76**
Married	1.8	1.69	1.55	1.83	5.8***	5.28**	4.87**	5.8***	7.38**	7.83**	8.69**	7.38**	7.83**	8.69**	8.69**
Native speaker Estonian (ref. yes)	.88	1.29	1.48	1.63	.91	1.05	1.19	.91	.83	.85	.87	.83	.85	.87	.87
Educational attainment	1.44**	1.26	1.25	1.25	1.3*	1.26	1.16	1.26	1.44**	1.41**	1.56**	1.44**	1.41**	1.56**	1.56**
Employment status (ref. full-time)	1.59	1.47	1.28	1.26	1.72	1.6	1.79	1.6	.87	.86	.8	.87	.86	.8	.8
Number of unemployment spells >6	.56**	.50**	.55*	.47**	.59**	.64*	.62*	.47**	1.77**	1.75**	1.62*	1.77**	1.75**	1.62*	1.62*
Number of job changes	1.39**	1.32*	1.22	1.29	1.36**	1.33**	1.33**	1.29	1.06	1.07	1.06	1.06	1.07	1.06	1.06

Table 2 (continued)

Educational attainment partner	1.43*	1.39	1.42	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Employment status partner (ref. full-time working)	.43	.43	.32*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Number of unemployment spells >6	.81	.78	.87	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Number of job changes partner	1.53**	1.6**	1.62**	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Presence of person to trust (ref. yes)	.39	.42	.45	.49	.48	.54				
Non-monetary help from family	1.85	1.63	1.77*	1.70	1.21	1.43				
Non-monetary help from friends (ref. no)	2.33*	2.67**	1.81*	1.79*	1.54	1.58				
Subjective income evaluation			1.14			1.6**				.95
Household expenditures restricted by										
No debts										1
A lot			.23*			.63				.29*
To a certain extent			.86			1.39				.39**
Not restricted			1.47			.86				2.04
Constant	.05***	.01***	.01***	.02***	.01***	.003**	.02***	.02***	.02***	.02***
Nagelkerke R ²	28.7	36.2	40.4	43.1	26.4	29.9	33.0	29.0	30.6	33.9
N	267	267	267	267	449	449	449	433	433	433

Notes:

P-values: * p ≤ 0.1; ** p ≤ 0.05; *** p ≤ 0.01
All coefficients Exp(b)

The second measure of labor market uncertainty, the number of job changes, shows a positive effect on the intention to have a second child. When characteristics of the partner are taken into account, the effect of the number of job changes of the female respondent does not reach significance anymore, but the number of job changes of the male partner is positively associated with the intention to have a second child. This result is somehow unexpected, since an uncertain labor market position of the woman was predicted to have a positive effect on the intention to have a first child, while couples confronted with an uncertain labor market position of the male partner are expected to have lower fertility intentions (economic crisis hypothesis H2a). This unexpected result could stem from the fact that no difference is made between voluntary and involuntary job changes. The number of job changes might be an indicator of a higher ability to adapt oneself to the new societal conditions rather than experienced uncertainty. This is confirmed by the finding that couples where the male partner is not working full-time have lower intentions to have a second child, which supports the economic crisis hypothesis (H2a).

The three measures of social support included in the second model are discussed next. The presence of a person to trust completely within the social network is not related to fertility intentions. Support with various activities (e.g., housework, babysitting, running errands, transport) positively predicts the intention to have a second child when received from friends. In the sample consisting of all women with one child without the partner taken into account, support received from family members is also positively associated with the intention to have a second child but once the economic situation of the household is added to the model, this coefficient loses significance. Still the positive effect of support received from friends on the intention to have a second child supports the social support hypothesis (H3). Concerning the intention to have a first child, none of the social support measures is found to be significant. This is probably due to the chosen operationalisation of support, which is support received in the past calendar year. Women who have no child are much less in need of support with household activities, therefore the availability of support would have constituted a better measure, but unfortunately this information was not in the data (see Bühler and Fratzak, 2004 for a more elaborate discussion on different measures of social support).

The economic situation of the household is added in the final model, measured by the subjective income evaluation and whether the household expenditures are restricted by debts. The hypothesized relation between a weak economic situation of the household and fertility intentions is supported by the data. Couples who are severely restricted in their household expenditures by debts have lower intentions to have a second child compared to households without debts. When partner characteristics are not taken into account, women with one child who evaluate their income more negatively are less likely to intend a second child while women without children are significantly less likely to intend a first child when restricted in their expenditures by debts.

CONCLUSION

The economic crisis following the transition from communism to capitalism in Central and Eastern Europe has often been identified with the cause of the sharp decline in fertility which occurred in these countries in the last two decades. The relation between economic hardship and fertility found on the macro level however does not translate simply to the micro level. The association between intended or realized fertility and indicators of economic uncertainty has been found to be positive, negative or absent in previous research (e.g. Kohler and Kohler, 2002; Huinink and Kreyenfeld, 2004; Philipov, 2002; Bühler and Fraczak, 2004). It appears that the new societal conditions in these countries created a more complex structure of incentives and constraints to have children than captured in the economic crisis argument. This study used data from Estonia, one of the former Soviet republics, to examine determinants of low fertility. I proposed a hypothesis related to the rise in opportunity costs for women with high human capital and labor market uncertainty. Concerning the effect of labor market uncertainty I proposed differing effects for men and women. While the failure of the male partner to provide for the family due to unemployment or otherwise unstable employment was expected to inhibit fertility intentions, an uncertain labor market position of the female partner was hypothesized to have a positive effect on the transition to parenthood because being a housewife and mother offers an alternative role for women for whom a successful career in the labor market is out of reach. The results of the empirical analysis support the opportunity costs hypothesis. Employed women with a high education progress slower to a first birth after the transition while the effect of employment and education is insignificant in the period of communism. Concerning the effect of labor market uncertainty on the intention to have a first or second child, the results are less conclusive. Evidence for the proposed hypotheses is found, but some unexpected results pose new questions. The number of job changes of both the male and the female partner is found to have a positive effect on the intention to have a second child and no significant relation is found when the intention to have a first child is concerned. These results are in contrast with the hypothesized negative effect and show that further research into the effect of human capital and labor market careers on fertility in the former communist countries is needed to shed more light on how economic and family related decision making are interrelated in these dynamic societies.

The negative effect of economic hardship on fertility as expected under the economic crisis hypothesis is supported by the empirical analyses. Besides the hypotheses relating to the economic situation of the household, I also examined the effect of support received from the social network. When women and couples with one child are considered support from friends is, as hypothesized, positively associated with fertility intentions. No effect is found for women without children. This is probably due to the measurement of social support, which only took into account help with various household chores actually received. Because women who do not have children are unlikely to need this kind of help,

potentially available help would have constituted a preferable operationalisation of the concept of social support. Unfortunately this information was not available in the data. Another limitation of the present study is that information about the male partner could only be included in one analysis of fertility intentions of couples with one child. The sample size of couples without children in the relevant age group (woman aged 20-44) was too small. Concerning the analysis of the transition to first birth, the inclusion of partner information was not possible because no information was collected about the family members at the time of childbirth, only the recent partner was interviewed. Because fertility decisions involve both partners, future research should not be limited to female respondents. Ideally, panel data of couples collected over an extended period of time should be used in order to have reliable information on both partners and identify causal relationships between economic and social conditions and fertility decisions.

NOTES

¹ Because each conception refers to a child born in this sample, the term risk of first birth rather than risk of first conception will be used.

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APPENDIX

Descriptive statistics of all variables used analysis 1

	Women born 1955 -1984		
	Frequency	Percent	# births
Educational attainment			
0 No primary education	7	.3	0
1 No vocational or professional education	19	.8	10
2 Vocational together with basic education	303	12.3	157
3 Vocational secondary education	1199	48.6	821
4 Vocational after secondary education	260	10.5	215
5 Higher professional / tertiary education	679	27.5	560
Ethnic Estonian			
1 Yes	1829	74.1	1307
2 No	637	25.8	456
Missing	1	.0	0
Working status			
0 Not working	1164	47.2	496
1 Working	1303	52.8	1267
In education			
0 Not in education	1781	72.2	1448
1 In education	686	27.8	315
Marital status			
1 Single	1528	61.9	943
2 Cohabiting	337	13.7	262
3 Married	564	22.9	535
4 Separated	38	1.5	23
Birth cohort			
Born 1955-1964	948	38.4	905
Born 1965-1974	684	27.7	618
Born 1975-1984	704	28.5	234
Born after 1984	336	5.4	6

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Historical period 1991-2001			
0 Birth occurred not in 1991-2001	2021	81.9	1349
1 Birth occurred 1991-2001	446	18.1	414
Educational attainment * Working status			
0 No primary education / not working	1164	47.2	496
1 No vocational or professional education / working	4	.2	4
2 Vocational together with basic education / working	95	3.9	91
3 Vocational secondary education / working	619	25.1	602
4 Vocational education after secondary education / working	170	6.9	167
5 Higher professional / tertiary education / working	415	16.8	403
Women born 1955-1984			
	Frequency	Percent	# births
Historical period 1991-2001*Educational attainment* Working status			
0 No primary education / not working / birth not in 1991-2001	2182	88.4	1504
2 Vocational together with basic education / working / birth in 1991-2001	30	1.2	27
3 Vocational secondary education / working / birth in 1991-2001	130	5.3	120
4 Vocational education after secondary education / working / birth in 1991-2001	23	.9	20
5 Higher professional / tertiary education / working / birth in 1991-2001	102	4.1	92
Age			
15	23	.9	23
16-17	58	2.4	58
17-18	162	6.6	162
19	349	14.2	224
20	383	15.5	257
21	320	13.0	236
22	295	12.0	218
23	199	8.1	142
24-26	267	10.8	207
26-40	410	16.6	235
Total	2467	100	1763

	Months under observation	
	Frequency	Percent
Working status		
0 Not working	9831	61,4
1 Working	6186	38,6
In education		
0 Not in education	6407	40,0
1 In education	9610	60,0
Marital status		
1 Single	13985	87,3
2 Cohabiting	804	5,0
3 Married	1151	7,2
4 Separated	77	,5
Total	16017	100,0

Descriptive statistics of all variables used in analysis 2 (fertility intentions)

	One child with Partner		No children without partner characteristics		No children without partner characteristics	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Fertility intention						
No	224	83.3	367	84.6	392	86.9
Yes	45	16.7	67	15.4	59	13.1
Age						
20-24	38	14.1	278	64.1	68	15.1
25-29	75	27.9	75	17.3	108	23.9
30-34	58	21.6	42	9.7	103	22.8
35-39	52	19.3	18	4.1	79	17.5
40-44	46	17.1	21	4.8	93	20.6
Currently employed						
Not full-time employed	94	34.9	220	50.7	153	33.9
Full-time employed	174	64.7	214	49.3	297	65.9
Missing	1	.4			1	.2
Marital status						

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Single	n.a.	n.a.	344	79.3	140	31.0
Cohabiting	101	37.5	66	15.2	122	27.1
Married	168	62.5	24	5.5	189	41.9
Native speaker						
Estonian						
Yes	185	68.8	318	73.3	299	66.3
No	84	31.2	116	26.7	152	33.7
Non-monetary help received from family members						
No	150	55.8	357	82.3	272	60.3
Yes	119	44.2	77	17.7	179	39.7
Non-monetary help received from friends						
No	196	72.9	291	67.1	320	71.0
Yes	73	27.1	143	32.9	131	29.0
Presence of person to trust						
Yes	227	84.4	381	87.8	367	81.4
No	42	15.6	53	12.2	84	18.6
Missing						
Household expenditures restricted by debts						
No debts	150	55.8	264	60.8	283	62.7
A lot	29	10.8	44	10.1	47	10.4
To a certain extent	79	29.4	101	23.3	109	24.2
Not restricted	11	4.1	25	5.8	12	2.7
Partner currently employed						
Not working or part-time employed	57	21.2	n.a.	n.a.	n.a.	n.a.
Full-time employed	212	78.8	n.a.	n.a.	n.a.	n.a.
Total	269	100	434	100	451	100

