



## Research Note

# Economic recession and fertility in the developed world. A literature review

TOMÁŠ SOBOTKA, VEGARD SKIRBEKK AND DIMITER PHILIPOV  
DEMOGRAPHY NETWORK OF THE EUROPEAN OBSERVATORY ON  
THE SOCIAL SITUATION - DEMONET



Vienna Institute of Demography, Vienna, Austria

*This Research Note has been produced for the European Commission by Tomáš Sobotka, Vegard Skirbekk and Dimiter Philipov on behalf of the Demography Network of the European Observatory on the Social Situation. The views expressed are those of the authors and do not necessarily represent those of the European Commission.*

**European Commission**  
Directorate-General Employment, Social Affairs and Equal Opportunities  
Unit E1 - Social and Demographic Analysis

Last updated on 10 February 2010



European Commission

## Summary

- Typically, fertility has a pro-cyclical relationship with economic growth. Recessions often lead to a temporary decline in period fertility levels one or two years later, partly reflecting a postponement of childbearing that is often later compensated during the period of improved economic conditions.
- Theories suggesting a counter-cyclical relationship between economic trends and fertility have not found much support in the empirical data. Among the OECD countries, GDP decline was associated with a subsequent fall in total fertility rates in 81% of the cases in the period 1980-2008.
- The negative impact of the recession on fertility rates is usually rather small, in the order of up to 5%. Major shifts in fertility rates, such as the fertility decline of the 1970s in many developed countries, may continue uninterrupted during the recession and may make the impact of the recession difficult to identify.
- Measures of unemployment and consumer sentiment reflect more closely the impact of the recession than a more general indicator of GDP decline. A close relationship between rising unemployment rate on one side and partnership formation and fertility on the other side has been repeatedly found in many studies.
- The recent recession took place under different social conditions than many recessions in the past. More women than ever are participating (and competing with men) on the labour market, most couples use reliable contraception that enables them to flexibly postpone their childbearing plans, and welfare systems are getting increasingly burdened by social security and health costs linked to the rapidly expanding numbers of elderly. All these factors can affect aggregate reproductive decisions, potentially aggravating the negative effects of the recession on fertility.
- Overall, the recent recession is likely to have some depressing effect on childbearing and push period fertility rates that are often considered too low to a slightly lower level in many countries, especially in 2010-2012.
- Preliminary data on births in 2009 confirm that many countries that recorded rising numbers of births and fertility rates after 2000 first experienced stagnation or a slight decline in total births in 2009. The Eurostat projection as of late January 2010 envisions a decline in total births in 2009 by 0.1% for the European Union as compared with a rise of 2.7% in 2008.
- We expect that the fertility reaction to the economic recession will be most pronounced among the younger people below age 28 and among the childless who plan to accumulate substantial resources before having children.

## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>1 Introduction</b>  | <b>5</b>  |
| <b>2 Key issues, major findings, and policy recommendations</b>                          | <b>6</b>  |
| Pro-cyclical effects of economic growth on fertility                                     | 6         |
| Recession effects: Pathways and mechanisms   | 6         |
| The recent recession   | 7         |
| Policy effects and recommendations   | 7         |
| <b>3 Economic recession and fertility: different pathways of influences</b>              | <b>8</b>  |
| <b>4 Economic recessions and fertility trends: empirical evidence</b>                    | <b>9</b>  |
| 4.1 GDP change, consumer confidence and fertility  | 10        |
| 4.2 Rising unemployment usually associated with fertility decline                        | 12        |
| 4.3 Rising unemployment and declining income lead to delayed partnership formation       | 14        |
| 4.4 The <i>Great Depression</i>  | 15        |
| 4.5 The 1970s recession  | 15        |
| 4.6 The economic shocks in Central and Eastern Europe after 1989                         | 16        |
| <b>5 How recessions affect childbearing: mechanisms and differential impacts</b>         | <b>17</b> |
| 5.1 The influence of unemployment  | 17        |
| 5.2 Income effects moderate the relationship between unemployment and fertility          | 18        |
| 5.3 The varied effects of uncertainty and anomie   | 19        |
| 5.4 Social differences in first birth patterns likely to increase                        | 20        |
| 5.5 Opportunity costs of childbearing will be differentiated by social status            | 21        |
| 5.6 Lower housing availability may lead to delayed family formation                      | 21        |
| 5.7 Economic recession likely to prolong time in education and thus delay childbearing   | 22        |
| 5.8 Young adults will be most affected by the recession                                  | 22        |
| <b>6 Conclusions and policy recommendations</b>  | <b>23</b> |
| 6.1 Summary of major findings  | 23        |
| 6.2 Policies to ease the situation of families during the economic crisis                | 24        |
| <b>References</b>  | <b>25</b> |
| <b>APPENDIX:</b>   |           |
| <b>Additional illustrations on the association between GDP change and the period TFR</b> | <b>34</b> |

## LIST OF FIGURES

|   |    |
|---|----|
| <b>Figure 1:</b> The effects of economic recession on fertility: Pathways of influences   | 9  |
| <b>Figure A1:</b> GDP change and change in the period TFR in the subsequent year; years when the GDP increased by less than 1%, 26 low-fertility countries, 1971-2008 | 35 |
| <b>Figure A2:</b> Economic recessions and period TFR in Sweden, 1850-2008 (1-year time lag). Years with negative GDP growth are marked by grey lines                  | 37 |

## LIST OF TABLES

|   |    |
|---|----|
| <b>Table 1:</b> GDP growth and change in the period total fertility rate (TFR) in 26 low-fertility countries, 1980-2008 (using 1-year time lag between GDP and TFR changes) | 11 |
| <b>Table A1:</b> Correlation between GDP change and period TFR in the years when the GDP increased by less than 1%, 26 low-fertility countries, 1971-2008                   | 35 |
| <b>Table A2:</b> Correlation between GDP change and period TFR in 26 low-fertility countries, 1956-2008   | 36 |

# ECONOMIC RECESSION AND FERTILITY IN THE DEVELOPED WORLD. A LITERATURE REVIEW

Tomáš Sobotka<sup>\*</sup>, Vegard Skirbekk<sup>\*\*</sup> and Dimiter Philipov<sup>\*</sup>

## 1 Introduction

In Europe, most countries experienced an economic set-back, which expanded into a recession towards the beginning of 2009. The recession brought significant rises in unemployment, stalled and in some cases falling incomes, plummeting consumer confidence and rising uncertainty about the future. Research on economic recessions in the past shows they can affect the dynamics of family formation, fertility, mortality, and migration. During the present economic downturn, the media coverage, especially in the United States, frequently suggests that the present crisis and uncertainty will result in a baby bust. Thus, the link between the downturn in the business cycle and declining birth rates is frequently assumed by the media, politicians and the lay public. However, hardly any systematic research has been done on this issue. Our contribution aims to bridge this gap.

Our review of the literature discusses how recessions affect fertility and in part also family formation insofar as it influences fertility trends. In addition, we provide simple empirical illustrations on the association between economic downturn and period fertility in the developed countries with low fertility. We first discuss the overall effect of the recession on fertility trends, focusing on aggregate-level indicators of the recession, such as GDP decline, falling consumer confidence and rising unemployment rates. We also look at selected studies on particular regions and periods of time, such as the ‘Great Depression’ of the 1930s, the oil shocks of the 1970s, and the economic crisis following the collapse of state-socialist system in 1989-1990. Subsequently, we review particular mechanisms how the recession influences fertility behaviour of women and men, discussing the effects of rising unemployment and falling employment stability, rising uncertainty, changing housing market, and rising participation in education. In conclusion, we summarise our research and provide policy recommendations.

As most of the economic recessions in the past were of a relatively short duration, their impact on fertility rates was temporary. Therefore, much of this contribution deals with relatively short-term swings in fertility rates, typically lasting 2-5 years, and does not cover major long-term alterations in fertility patterns which are of different nature and typically caused by other factors. Because of this relatively short-term impact most of the studies are unable to distinguish between changes in fertility level and changes in fertility timing (postponement or advancement of birth), which jointly affect the usual aggregate indicators of fertility such as the period total fertility rate (TFR). However, short-term fertility movements are unlikely to have a measurable impact on the number of children women and men will have at the end of their reproductive lives (with an exception of a severe crisis like in the case of the Great Depression of the 1930s).

---

<sup>\*</sup> Vienna Institute of Demography, Vienna, Austria (author for correspondence: Tomas Sobotka, email: tomas.sobotka@oeaw.ac.at)

<sup>\*\*</sup> International Institute for Applied Systems Analysis, Laxenburg, Austria

## **2 Key issues, major findings, and policy recommendations**

### **Pro-cyclical effects of economic growth on fertility**

- Economic recession has a multifaceted influence on fertility decisions. Its effects are often differentiated by gender, age (or a position in the life cycle), ethnic, migrant and social group, and number of children.
- Also the ‘opportunity costs’ of childbearing (time, skills and income lost due to child-care and child-rearing) are differently affected by the recession among various social groups.
- Typically, fertility has a procyclical relationship with economic growth. Recessions often lead to a temporary decline in period fertility levels one or two years later, partly reflecting a postponement of childbearing that is often later compensated during the period of improved economic conditions.
- Theories suggesting a counter-cyclical relationship between economic trends and fertility have not found much support in the empirical data. Among the OECD countries, GDP decline was associated with a subsequent fall in total fertility rates in 81% of the cases in the period 1980-2008.
- The negative impact of the recession on fertility rates is usually rather small, in the order of up to 5%. Major shifts in fertility rates, such as the fertility decline of the 1970s in many developed countries, may continue uninterrupted during the recession and may make the impact of the recession difficult to identify.
- Measures of unemployment and consumer sentiment reflect more closely the impact of the recession than a more general indicator of GDP decline. A close relationship between rising unemployment rate on one side and partnership formation and fertility on the other side has been repeatedly found in many studies.
- Economic recession often has a stronger impact on first birth trends as younger and childless people as well as those without own housing are more strongly affected.

### **Recession effects: Pathways and mechanisms**

- At an individual level, recession usually has a stronger negative impact on fertility of men, of young adults who are not well established on the labour market and of the higher educated, who may be afraid of losing their job and career prospects when having a child in economically uncertain times.
- Different types of uncertainty, such as uncertain employment prospects, low income, low life satisfaction, and anxiety about the future, are often hypothesised to negatively affect childbearing and lead to the postponement or foregoing of childbearing plans. Available literature suggests that the effect of uncertainty is differentiated by social status, especially education level, with higher-educated adopting most frequently ‘risk-averse’ behaviour (i.e., refraining from childbearing in uncertain circumstances).
- Lower disposable income, collapse in housing construction and lower availability of mortgages and affordable loans are likely to make housing less available for younger couples despite some general decline in housing prices. This may have a negative

effect on fertility in countries where privately owned housing is commonly perceived as a precondition to parenthood.

- Economic recession may also lead to a prolongation of time in higher education, which in turn would lead to a further postponement of births and lower fertility rates.

### **The recent recession**

- The recent recession took place under different social conditions than many recessions in the past. More women than ever are participating (and competing with men) on the labour market, most couples use reliable contraception that enables them to flexibly postpone their childbearing plans, and welfare systems are getting increasingly burdened by social security and health costs linked to the rapidly expanding numbers of elderly. All these factors can affect aggregate reproductive decisions, potentially aggravating the negative effects of the recession on fertility.
- Overall, the recent recession is likely to have some depressing effect on childbearing and push period fertility rates that are often considered too low to a slightly lower level in many countries, especially in 2010-2012.
- Preliminary data on births in 2009 confirm that many countries that recorded rising numbers of births and fertility rates after 2000 first experienced stagnation or a slight decline in total births in 2009. The Eurostat projection as of late January 2010 envisions a decline in total births in 2009 by 0.1% for the European Union as compared with a rise of 2.7% in 2008.
- We expect that the fertility reaction to the economic recession will be most pronounced among the younger people below age 28 and among the childless who plan to accumulate substantial resources before having children.

### **Policy effects and recommendations**

- Public policies often modify or even reverse the relationship between recession and fertility. Extended periods of parental leave and home-care schemes, coupled with employment protection, may stimulate some women to withdraw temporarily from the labour market and have a child. Generous unemployment benefits and relatively high parental leave allowances reduce the cost of childbearing for unemployed couples and may therefore make unemployment conducive to childbearing.
- In Finland, the provision of home-care child allowance to parents who stay at home with their child below the age of 3 provided an attractive alternative to unemployment and shrinking work opportunities for many women. It has (unintentionally) led to a slight rise in period fertility at the time of a deep economic recession in the early 1990s.
- Governments should pursue policies that help women and younger people acquiring and keeping employment with reasonable career prospects, even if this would reduce job protection among the senior employees.
- Reducing unemployment growth, especially of long-term unemployment, and making labour market more open and flexible for younger people is the most important way how the potentially detrimental effect of the recession can be mitigated.

### **3 Economic recession and fertility: different pathways of influences**

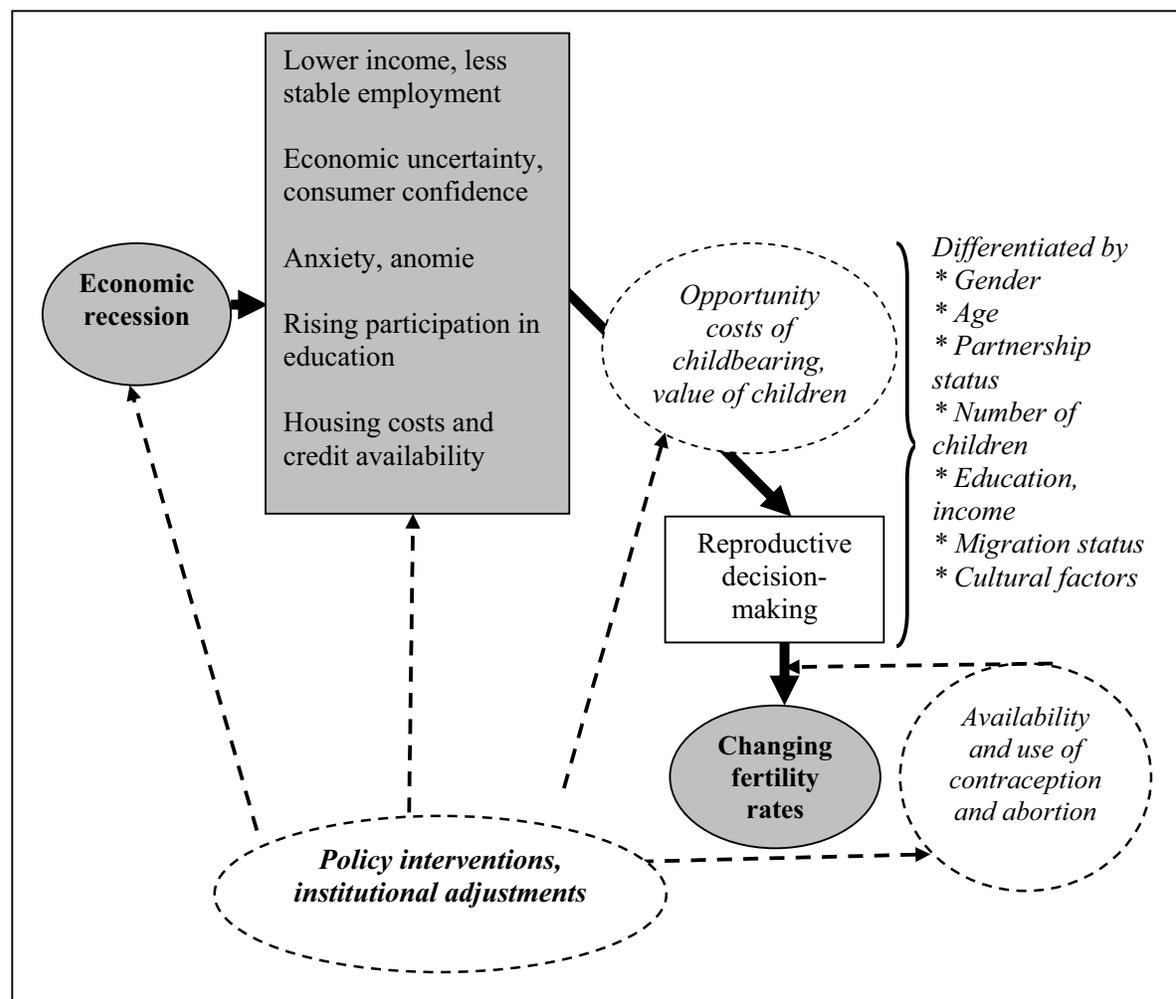
Most of the research on the impact of economic downturn on fertility is anchored at an individual level and contributes greatly to our understanding of diverse channels through which the recession affects behaviour (see Figure 1). However, due to multiple and at times opposing effects, this evidence cannot be directly ‘translated’ into aggregate-level conclusions on the likely consequences of the recession for fertility. Individual fertility decisions at times of economic recession will often be differentiated by gender, age (or a position in the life cycle), ethnic, migrant and social group, and number of children (e.g., de Cooman et al. 1987, Kreyenfeld 2009, Adsera 2005a). Also the ‘opportunity costs’ of childbearing (i.e., time, skills and income lost due to child-care and child-rearing) are not affected by the recession in the same way among various social groups. As Figure 1 illustrates, policies may influence fertility at different levels during the recession. They may alter the course of economic recession itself (e.g., by boosting or restricting government spending), they may target particular symptoms and consequences of the recession (e.g., education enrolment, housing market, or unemployment trends), or they may directly affect opportunity costs of childbearing by changing monetary support to families, childcare system or parental leave provision.

As most of the economic recessions in the past were of a relatively short duration, their impact on fertility rates was temporary (Lee 1990). Because of this relatively short-term impact most of the studies are unable to distinguish between changes in fertility level and changes in fertility timing (postponement or advancement of birth), which jointly affect the usual aggregate indicators of fertility such as the period total fertility rate (TFR). However, short-term fertility movements are unlikely to have a measurable impact on the number of children women and men will have at the end of their reproductive lives (with an exception of a severe crisis like in the case of the Great Depression of the 1930s).

Although much can be learned from past crises, the current crisis is in many ways different than any earlier recession and caution against over-interpreting the reviewed studies is warranted. Unlike other recent recessions, such as the 1997-98 financial crisis hitting especially Asia and Russian Federation, the Scandinavian crisis of the early 1990s or the 1994 Mexico crisis, the current recession is global, affecting virtually all markets in all countries in the world. The cultural and institutional context in Europe is substantially different than at the time of the past crises: More women than ever are participating (and competing with men) on the labour market, most couples use reliable contraception that enables them to flexibly postpone their childbearing plans, and welfare systems are getting increasingly burdened by social security and health costs linked to the rapidly expanding numbers of elderly. The average age at first birth reached 27-29 years for women in most countries of Europe as well as in Japan (Sobotka 2008a), rising by 3-5 years since the early 1970s. This leaves women and couples less flexibility to put off parenthood towards a later age. In many countries, the current crisis coincides with pension system reforms which effectively increase the age of retirement, implying that fewer older workers are leaving the labour market and the younger ones may have to compete for fewer jobs and accept lower wages. All these factors can affect aggregate reproductive decisions, potentially aggravating the negative effects of the recession on fertility.

Because our focus is on the most developed countries, we pay relatively little attention to the evidence for the less advanced and more traditional societies with generally higher fertility rates, where the cultural and social factors affecting fertility may operate very differently.

**Figure 1:** The effects of economic recession on fertility: Pathways of influences



NOTE: Dashed arrows are shown for relationships that are not discussed in depth in our review as they are not central for our overview and, often, they are not easily observable. Areas marked in grey and relationships shown by bold arrows are in the main focus of our review.

#### 4 Economic recessions and fertility trends: empirical evidence

Research on the effect of economic recessions on fertility usually provides support to the idea that fertility reacts negatively to the downturns of the business cycle—in other words, most studies find a ‘procyclical relationship’ between economic growth and fertility in the developed world. Typically, fertility decline during a recession is temporary and usually followed by a compensatory rise in fertility (or at least a slowing-down in the pace of its decline). These downward shifts in fertility start with a short time lag of one to two and a half years.<sup>1</sup> The negative relationship between economic crisis and fertility as well as marriages

<sup>1</sup> Some time lag should be expected even if couples reacted very rapidly to changing economic conditions, considering the time between the initiation of pregnancy attempts and achieving a conception and between conception and childbirth.

has also been noted in historical studies related to the 19th and the first half of the 20th century (e.g., Lee 1990, Van Bavel, 2001 for Belgium; Yule 1906, Teitelbaum 1984, and Tzanatos and Simons 1989 for Great Britain, Bengtsson et al. 2004 for the Eurasian region). Economic recessions have also been found to contribute to a temporary fertility decline in the developing world, including sub-Saharan Africa (e.g., Eloundou-Enyegue et al. 2000 for Cameroon).

Recessions commonly lead to a postponement of childbearing, which is often later compensated during the times of economic prosperity. Rindfuss et al. (1988: 87) pointed out that “fertility delay in the West is a time-honored, normatively approved response to harsh economic conditions.” In this part we review the overall evidence on the relationship between aggregate-level economic indicators and fertility, without discussing the mechanisms linking, say, GDP decline, and fertility rates. We highlight especially the studies that control for multiple aggregate social and economic factors and those that employed macro-economic indicators in the essentially ‘micro-level’ studies of the factors affecting fertility behaviour.

From the theoretical perspective, the idea that fertility reacts positively to economic prosperity and falls in times of crisis has been pursued for centuries. For instance, Adam Smith linked in 1776 in his treatise *The Wealth of Nations* the rate of economic development and growth to “multiplication of the species” (Spengler 1976: 173). Becker (1960: 231) compares children to “durable goods,” demands for which would increase with a rise in couple’s income and with a decline in their “price”. Easterlin (1973, 1976) makes an important modification of these ‘classical’ economic arguments, emphasizing the role of income relative to economic aspirations of the couple. In this view, fertility varies with the relative affluence of the younger cohort, which is gauged against their childhood experiences from their parents’ household. In contrast, an important contribution of Butz and Ward (1979a and 1979b) suggested that fertility trends are likely to become countercyclical with rising employment of women. For women, economically good times would be most expensive to have children (p.321) and periods of prosperity would therefore be associated with the lows in fertility rates. Although Butz and Ward’s hypothesis found support in their analysis of U.S. data pertaining to the first half of the 1970s, later research by Macunovich (1996) suggested that the U.S. fertility remained ‘pro-cyclical’ as the negative effects of unemployment on fertility surpassed the ‘positive’ effects of the ‘lower price’ of women’s time during the recession: “periods of high unemployment appear to have a stronger effect in disrupting a woman’s expectations regarding future income streams than they do in providing “windows of opportunity” for pregnancy” (p. 251). This does not suggest that the insights of Butz and Ward’s hypothesis are incorrect: Rather, we should interpret the aggregate effects of the recession as outcomes of frequently countervailing forces and mechanisms where some individuals find it advantageous to have a child during economically uncertain times, whereas others will decide to postpone the next birth or abstain from childbearing altogether. While the overall outcome of different forces can be observed, it is particularly difficult to disaggregate the ‘positive’ and ‘negative’ influences of the recession on individual fertility decisions.

#### **4.1 GDP change, consumer confidence and fertility**

Many studies make a link between economic recession and fertility decline when interpreting fertility trends (e.g., Ogawa 2003 for Japan; Rindfuss et al. 1988 for the United States), but relatively few provide a formal analysis using aggregate indicators of economic performance such as the Gross Domestic Product (GDP). When analyzed, GDP decline often correlates

with a subsequent fall in fertility rate (e.g., Goldstein et al. 2009).<sup>2</sup> A simple descriptive analysis in Table 1 confirms that this was a dominant experience across most of the rich low-fertility societies during the last three decades. While, on average, the period TFR declined slightly more often than it increased in 26 analyzed countries, the likelihood of decline was much higher following the years with falling GDP levels (four fifths of the 62 country-years, odds ratio of decline 4.2) and it was also elevated in the years with a mere stagnation in the GDP (i.e., GDP growth of less than 1%), when the TFR declined in two-thirds of the 60 observations. In contrast, in the years with the GDP growth of 1% or more there were almost as many observations with the TFR rise as with the TFR decline. We provide an additional analysis of this association in the Appendix and comment on the first evidence on the impact of the recent recession in Europe in the concluding section.

**Table 1:** GDP growth and change in the period total fertility rate (TFR) in 26 low-fertility countries, 1980-2008 (using 1-year time lag between GDP and TFR changes)

| <b>GDP change</b>                            | <b>Total cases (country-years)</b> | <b>Cases with TFR decline</b> | <b>Cases with TFR increase</b> | <b>Percent with TFR decline</b> | <b>Odds ratio TFR decline</b> |
|--|------------------------------------|-------------------------------|--------------------------------|---------------------------------|-------------------------------|
| Recession (GDP decline)                      | 62                                 | 50                            | 12                             | <b>81</b>                       | <b>4.2</b>                    |
| Stagnation (GDP growth between 0.0 and 0.9%) | 60                                 | 39                            | 21                             | <b>65</b>                       | <b>1.9</b>                    |
| Growth (GDP growth of 1.0% and higher)       | 579                                | 297                           | 282                            | <b>51</b>                       | <b>1.1</b>                    |
| Total  | 701                                | 386                           | 315                            | <b>55</b>                       | <b>1.2</b>                    |

NOTES: The most recent GDP data pertain to 2007 and the most recent TFR data to 2008. Included are all the OECD countries except Mexico, Turkey, Luxembourg and Iceland. Not all countries are covered for the whole period of 1980-2008, the GDP time series for the Central European countries (Czech Republic, Hungary, Poland, Slovakia) are missing for the period through 1991-93. An exclusion of these countries does not alter the results of the analysis.

SOURCES: GDP change: authors' computations based on OECD (2009a) time series of Gross Domestic Product in US Dollars (Constant prices, constant purchasing power parity). TFR change: authors' computations based on Council of Europe (2006), Eurostat (2008 and 2009) and data published by the national statistical offices.

However, this correlation often dissipates in a multivariate model, when other indicators, capturing better the pathways through which economic recession affects fertility, are introduced. For instance, a study on Australian fertility in 1976-2000 (Martin 2004) reported a highly significant and positive relationship between GDP and TFR changes, but this relationship became less clear when selected control variables were introduced. For Sweden, Santow and Bracher (2001: 358) identified a strong effect of the recession (as measured by GDP decline) on first birth rates, controlling for unemployment and a number of individual social, economic and family-related characteristics of the women studied: conception rates were reduced by 24% in the years when the recession struck.

In the context of post-communist countries of Central and Eastern Europe, Billingsley (2009) found that GDP change was positively correlated with fertility rates at all age groups above 20, controlling for inflation and wage growth. She also found, however, that GDP rise was positively linked to fertility postponement; similar result was obtained in a more extensive model on first births in Hungary (Aassve et al. 2006). This result may be peculiar to the former state-socialist countries (see also below). For 18 countries in Latin America, Adsera and Menendez (2009) show that GDP is positively linked to fertility in a macro-level analysis, but this relationship mostly reflects shifts in unemployment and disappears when

<sup>2</sup> The period of rapidly declining fertility rates in the 1970s appears to be an important exception from this general observation, when fertility trends in many countries were either rather insensitive to business cycle or were counter-cyclical (see below; see also Appendix).

unemployment is included in the model. In a model using individual-level data for ten countries, GDP change is positively linked to first birth transitions, even when controlling for unemployment. Using a longer time series of data on the changes in GDP, births and marriages in 1908-1990 Palloni et al (1996) found a significant pro-cyclical association between GDP trends and marital births with a 1-year gap in only five out of 11 Latin American countries analyzed (significant only in Cuba), suggesting that the response of fertility to economic shocks was relatively minor in most cases.<sup>3</sup>

Arguably, the perception of crisis can be better reflected in the indicators of consumer confidence, which have been employed in the explanatory models of short-term fluctuations in the TFR in the Netherlands since the early 1980s (de Beer 1991 and 1997). Van Giersbergen and de Beer (1997: 25) estimated that a rise in the index of consumer confidence by 10 percentage points is associated with a rise in the number of births by about 3 thousand per year (ca. 1.5% of total births; the time lag between the two time series is 2 years and a quarter). More recently, Fokkema et al. (2008: 774-776) applied a regression model with a two-years time lag to estimate the effects of changes in the index of consumer confidence on the period TFR in the Netherlands. They showed that the pace of fertility increase among women above age 30 (i.e., the 'recuperation' component of delayed childbearing) varied with the business cycle and concluded that a 10-point increase in the consumer confidence index is associated with an increase in the TFR of about 0.04, of which one half is attributable to first births and the other half to second births.<sup>4</sup> In his study of fertility cycles in the United States between 1920 and 1957, Becker (1960) found that changes in birth rates were positively associated with trends in purchases of consumer durables (with a time lag of one year) and that first birth trends were particularly sensitive to cyclical change.

#### **4.2 Rising unemployment usually associated with fertility decline**

Differently from the GDP change, unemployment growth constitutes a more tangible indicator of the impact of economic crisis which has a direct bearing on women and men of reproductive age. Thus, it comes as no surprise that a strong negative relationship between unemployment on one side and fertility rates as well as partnership formation on the other side has been repeatedly identified across developed countries. The effect of male unemployment appears to be particularly important, arguably in line with the continuing importance of male income for family formation (see also below). High and persistent unemployment among young adults, coupled with unstable jobs and high levels of employment uncertainty has become one of the most salient explanations of low and delayed partnership and family formation in Southern Europe, especially in Spain (Ahn and Mira 2001; Baizán et al. 2001, Simó Noguera et al. 2003 and 2005, Adsera 2004 and 2005a; d'Addio and d'Ercole 2005, Billari and Kohler 2004). In a cross-country comparison, unemployment rates are negatively correlated with the period total fertility rate in Europe since the mid-1990s (d'Addio and d'Ercole 2005: Figure 17). This relationship has also been found in micro-level models that use selected aggregate-level indicators as indicators of

---

<sup>3</sup> The coefficients for six countries (Chile, El Salvador, Mexico, Panama, Venezuela, and Uruguay) suggested that economic crisis might have led to a slight increase in marital births, but none of the coefficients obtained was significant.

<sup>4</sup> For an illustration of the magnitude of this effect, consider the case of the recent recession. In 2007, the index of consumer confidence in the Netherlands stood at +8 on average, while it plummeted to -24 in the second quarter of 2009 (CBS Statline 2009, accessed 26 June 2009: <http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLEN&PA=7388eng&HD=090626-1713&LA=EN>). If the latter value were representative of the whole year 2009, the TFR in the Netherlands would fall by  $(3.2 * 0.04) = 0.128$  between 2009 and 2011 (assuming that the TFR reacts with a lag of two years).

period or regional conditions in their investigation of the factors affecting fertility behavior. In these models, the effect of aggregate unemployment usually persists besides the effects of individual unemployment experience. The underlying reasons for this aggregate effect are difficult to establish (Schmitt 2008); it may capture perceptions and expectations of job instability, economic insecurity, awareness of the crisis, and other not easily identifiable factors. Hoem (2000) suggests that employment trends “influence childbearing behavior via the impressions couples get concerning how things may develop for themselves in the future.”

Adsera (2005a) found that across Europe high female unemployment rate led to first birth postponement since the 1980s (but not in the 1970s and the early 1980s) and some effect of unemployment also persisted for second and third births. High unemployment has particularly depressing effect on fertility when it is combined with a high share of self-employment (Adsera 2004).<sup>5</sup> This relationship suggests a positive influence of more stable jobs in public sector among women, for whom work stability (and guaranteed return to employment) is supportive of higher fertility. In most countries, public sector jobs are also ‘safer’ in that they are less affected by the recession. In contrast, another comparative study of the effects of unemployment on fertility, using regional unemployment data for four countries, detected a significant contribution of local unemployment level only for women in France, and this effect was in the opposite direction: an increase in regional unemployment by 1 % point increased the likelihood of having first birth by 3 % (Schmitt 2008: 42). Recently, Goldstein et al. (2009) reported that declining unemployment, associated with a GDP upturn in 2000-2008 in many countries of Europe, was positively associated with the period total fertility rate and the current rise in unemployment is likely to have a depressing effect on the TFR.<sup>6</sup>

An extensive research on the effects of unemployment on birth rates has been conducted in Nordic countries. Kravdal (2002) analyzed jointly the effects of individual unemployment and aggregate unemployment on first and higher-order births in Norway. Using simulations, he found that the contribution of rising unemployment to declining TFR—estimated at 0.08 during the recession around 1993—was dominated by the aggregate effect rather than by individual experiences of unemployment.<sup>7</sup> Pronounced swings in fertility rates in Sweden have been associated with ups and downs of the business cycle, supporting a notion of ‘pro-cyclical fertility’ (Andersson 2000) or, as (Hoem and Hoem 1996) termed it, a ‘roller-coaster fertility.’ Santow and Bracher’s (2001) study shows that unemployment has affected particularly first birth trends in Sweden. The rise in unemployment rate to 5-9 % in the same age group as was the respondent’s age category reduced the likelihood of first birth conception by 21% and the rise of unemployment above 10% resulted in a decline in first conceptions by one half (Table II in Santow and Bracher 2001). Similarly, trends in local employment levels ‘explained’ a large fraction of declining first birth rates during the recession of the first half of the 1990s, even when controlling for individual income and employment situation (Hoem 2000). Second birth rates were much less affected by economic trends, whereas third birth rates were as volatile as first birth rates. The deep recession in Finland in 1992-94 constitutes an important exception from the usual association between recession and fertility: whereas first births depicted a declining tendency from 1992, a year when the recession started, there was a continuing upward trend in second and higher-order

---

<sup>5</sup> Adsera (2004: Figure 1) also provides a useful simulation of a combined effect of female unemployment and self-employment of the period TFR, where the effect of unemployment on fertility becomes stronger with the higher percentage of self-employed in the economy.

<sup>6</sup> A simple model for 27 OECD countries, controlling for GDP growth, suggested that doubling of the unemployment rate would result in a decline in the period total fertility rate by 0.09 in absolute terms (Goldstein et al. 2009, Table 5, Model 3).

<sup>7</sup> This aggregate effect was linked to a rise in female unemployment from 2 to 4% and in male unemployment rate from 2 to 6%; these are rather modest levels in comparison with most other countries of Europe.

births throughout the recession (Vikat 2002, 2004). This finding gives an indication on the importance of welfare and family policies for moderating or even reversing the impact of the recession on fertility, at least among some social groups.

In the United States, Macunovich (1996) reported a negative effect of increased female unemployment on fertility, emphasizing the disruptive effects of lower expectations concerning future income. This finding is in agreement with Rindfuss' et al. (1988) analysis of long-term trends in first births in 1917-80, in which low unemployment, low inflation and rapid economic growth were associated with higher first birth probabilities at ages 25-39 (p. 76). Similarly, Berkowitz King (2005: Table 12.2) found a negative effect of annual unemployment rates on first birth rates among the U.S. women, whereas Mocan's (1990) econometric analysis of the US fertility trends finds a negative effect of both male and female unemployment trends only in bivariate analyses. In England and Wales, higher male unemployment was linked to delayed or reduced first and second birth rates among women below age 30 (de Cooman et al. 1987). Also in East Asia fertility is negatively affected by unemployment. An analysis of municipal data for Japan suggests that young men's unemployment trends contributed significantly to the TFR decline in 2000-2004 (Ogura and Kadoda 2008). In Taiwan, monthly time series of birth rates were negatively affected by unemployment trends in 1978-2000 (Huang 2003).

#### **4.3 Rising unemployment and declining income lead to delayed partnership formation**

Rising unemployment contributes to the delays in marriage and partnership formation, which indirectly lead to the decline in first birth rates. Prioux (2003: Figure 4) has presented a clear-cut example of an inverse relationship between youth unemployment rate (at age 20-24) and the rate of first union formation in France, indicating that difficulties experienced on the labour market lead to the deference of both marriage (which is rather infrequent as a first union) and entry into cohabitation.

Delayed partnership and marriage formation has most salient effect on birth trends in countries where the traditional tie between marriage and childbearing remains strongest. Until recently this pattern was typical of Southern Europe, where marriage was commonly seen as a precondition to childbearing and marriages have been delayed in economically uncertain times (e.g., Ahn and Mira 2001, Castro Martín 1992).

Outside Europe, countries of East and South-East Asia have experienced a remarkable postponement and decline in marriages, which 'explain' a large portion of their fertility decline in the last decades (Chang 2006; Matsukura et al. 2007, Jones 2007). These trends have been most thoroughly analyzed in Japan (e.g., Ogawa and Retherford 1993, Ueno 1998, Retherford et al. 2001, Takahashi 2004, Matsukura et al. 2007), where the assumptions about cohort trends in first marriage rates remain the most important component of fertility projections (Kaneko et al. 2008). Retherford et al. (2001) show a link between economic recession and accelerated postponement of marriages in Japan, suggesting that recession slows down income growth and makes marriage unaffordable for many younger people. In the case of Korea, Eun (2003) argues that the 1997 economic crisis which brought higher unemployment, sharply rising job instability and the rise of temporary jobs among the younger people has affected marriage, fertility and divorce trends, and that marriage postponement was the most important 'proximate' determinant of declining fertility. However, at least two Asian countries appear to show an opposite pattern. In Indonesia, the severe economic crisis of 1997-98 led to the disruption in long-term trend towards later marriage, increasing the likelihood among younger men and women of entering marriage in 1998-99 (Nobles and Bутtenheim 2006). In Taiwan, Huang's (2003) modeling of monthly

data suggests that marriage rates were positively affected by unemployment. Finally, in the U.S., annual unemployment trends had a negative effect on the entry into marriage as a first union among women when individual characteristics were controlled, while they had no effect on the entry into cohabitation (Berkowitz King 2005).

#### **4.4 The Great Depression**

As noted above, historical time series of economic and demographic indicators suggest that business cycle was positively linked with fertility swings in the past. The analysis of the Great Depression of the 1930s generally confirms this observation, although the Depression did not affect the long-term declining trend in birth rates in the 'Western world'. Caldwell (2008: 430 and Table 1) suggested that fertility decline of the first demographic transition "bottomed out in the economic depression of the 1930s, probably later and at a lower fertility level than would have been the case without the depression." When inspecting changes over 5-year period of time (1929-34) van Bavel (2007) did not find a convincing correlation between GDP change and net reproduction rate in 11 Western countries during the interwar period. A continuity of long-term fertility decline is also noted by Greenwood et al. (2006), who state that in the United States and Western Europe "it is hard to detect a structural break in fertility due to the Great depression" (p. 205). Moreover, fertility decline halted in many countries around 1933 without many signs of economic prosperity returning (Caldwell 2006); paradoxically, a long-term fertility increase often began at the time of massive poverty and unemployment when the economy has hardly begun its recovery.

The Great Depression was particularly severe in the United States, therefore, its impact on the U.S. fertility has been studied with a special interest. Most studies find that the crisis had an 'antinatalist' effect (e.g., Rindfuss et al. 1988, Andorka 1978: 119). A classical study by Kiser and Whelpton (1953), known as the "Indianapolis study," attributed the fall in fertility rates to the sudden increase in unemployment as well as to economic uncertainty. Galbraith and Thomas (1941, cited in Kirk and Thomas 1960) showed a close correlation between factory employment index and total live births in 1919-37; similar conclusion of a pro-cyclical trend in births and marriages in the inter-war period has been reached in a careful correlational analysis by Kirk and Thomas (1960) and by Becker (1960). Kirk and Thomas conclude that the economic indicators (namely, annual trends in per capita income, industrial production and employment) explain 58-59 % of the fertility variance in 1920-57, of which about one half influenced fertility indirectly via trends in nuptiality (p. 249). Ryder's (1980) decomposition has demonstrated that the period of the Great Depression saw a substantial postponement of childbearing which put a downward pressure on the period TFR. The long duration of low fertility during the Great Depression can also be discerned in the U.S. cohort fertility series (Campbell 1978, Cutright and Shorter 1979, Morgan 1996), because of the increase in the number of childless women and women who had one child only. Childlessness peaked among the women born in 1901-10 who were most severely hit by the recession (Morgan 1991); indicating that the social and economic crisis had a "disrupting and delaying" effect on family formation (Morgan 1991, p. 801).

#### **4.5 The 1970s recession**

Until the current recession the most severe post-war global economic downturn took place in the mid-1970s, following the huge rise in oil prices in 1973 and the subsequent energy crisis. Research for some European countries suggests that this recession—similarly to the Great Depression—might have accelerated the ongoing fertility decline and postponement, but did not induce this trend, which has been under way in most countries since the late 1960s (e.g., Hobcraft 1996 for England and Wales, Lesthaeghe 1983 for Belgium). Demographic studies attribute the observed decline mostly to the wide-sweeping changes in values and attitudes that also had roots in the late 1960s (e.g., Lesthaeghe 1983 and 1995); some studies suggest that the fertility and marriage decline were facilitated by the rapid spread of the contraceptive pill (van de Kaa 2001, Goldin and Katz 2002).

De Cooman et al.'s (1987) analysis concluded that fertility rates in England and Wales in the 1970s were rather insensitive to contemporary economic developments. Some research suggests that the importance of economic trends might have been overemphasized because other types of data, especially cultural and attitudinal indicators, were difficult if not impossible to obtain (Murphy 1992). Murphy (1993) proposed that the swings in the contraceptive pill use, partly induced by the 'pill scares,' provide a more salient explanation of short-term changes in fertility in England and Wales during the 1970s and the early 1980s. Lesthaeghe's (1983) analysis of regional data for 43 *arrondissements* in Belgium shows that fertility started falling in the later period of rapid economic growth in the 1960s and that regional-level unemployment growth and income depreciation were not linked to an especially intensive fertility decline.

In the United States, a sharp decline in total fertility rate in the 1960s and in the 1970s, when a trough of 1.76 was reached in 1978, stimulated new hypotheses about the factors determining fertility cycles and new models of fertility projections (Wachter 1975, Easterlin 1976, Butz and Ward 1979a and 1979b, Oppenheimer 1994; Macunovich 1996). Although fertility rates fell in the two years following the recession of 1974-75, this fall was probably unrelated to the recession and was less pronounced than in the previous years of economic expansion (Butz and Ward (1979a).

#### **4.6 The economic shocks in Central and Eastern Europe after 1989**

The drastic fertility decline in Central and Eastern Europe (CEE) during the 1990s has been frequently attributed to the economic crisis, economic uncertainty, anomie and disruption following the collapse of the state-socialist political system (e.g. Ranjan 1999, UNECE 2000). However, the economic trends in the region differed from a typical economic crisis experienced by Western European countries and therefore should be seen as specific cases of a profound economic and social transformations accompanied by the usual and frequently severe symptoms of economic crisis. In almost all the countries of the region the economies stagnated or declined for many years, unemployment emerged and then rose sharply and many countries experienced hyper-inflation. The trends in the GDP have generally shown the expected negative association with fertility rates, although only in the later and slower part of fertility decline around the mid-1990s (UNECE 1999). The potential error of confusing a major shift in fertility pattern towards delayed and lower fertility with short-term correlations associated with the economic cycle looms particularly large here (Philipov and Dorbritz 2003).

Many descriptive studies on individual countries emphasize the negative effect of economic uncertainty, unemployment, inflation, and declining family support for fertility change in the CEE (see contributions cited in UNECE 2000, Philipov and Dorbritz 2003, Sobotka 2004 and

2008 and Frejka 2008). A profound economic depression contributed to the observed disruptions in fertility trends. However, a number of observations point out that changing economic conditions can explain only a part of fertility trends in the 1990s. In many CEE countries, rapid fertility decline began before the economic recession took place (UNECE 1999). The resumption of economic growth towards the late 1990s did not bring a perceptible recovery of fertility (Philipov and Dorbritz 2003). Finally, countries that experienced a relatively smooth economic transformation, such as the Czech Republic and Slovenia, experienced as pronounced fall in total fertility rates as the countries that suffered protracted economic shocks, such as Bulgaria, Russia or Ukraine (Philipov and Dorbritz 2003, Sobotka 2003).

Everywhere in the region, childbearing has been postponed towards later ages, inducing tempo distortions that explain a considerable portion of the TFR decline (Sobotka 2003, Philipov and Kohler 2001). Although childbearing delays constitute an expected consequence of economic crisis, a puzzling observation has been made, showing that the countries least affected by the economic crisis experienced most intensive rise in the age at first birth (Sobotka 2003, Billingsley 2009). Thus, in contrast to the observations for some other regions, higher prosperity and better economic performance in Central and Eastern Europe seemed to be more conducive to childbearing delays than the economic recession.

## **5 How recessions affect childbearing: mechanisms and differential impacts**

After reviewing the aggregate relationship between economic recession and fertility rates, we discuss different factors and mechanisms through which the recession influences fertility behaviour. The crisis is not indiscriminate with respect to age, skills, gender and migrant status. It affects first male-dominated jobs with high share of migrant workers, especially in sectors that are sensitive to business cycle volatility, such as construction. Younger and low-skilled employees, with less stable work and shorter tenures, but also with lower levels of job protection, are more at risk of losing their jobs than prime-age workers (Verick 2009). In contrast, women are often employed in public and service sectors such as healthcare and social services that are initially less affected by the crisis.

Stable employment, relatively high income and reasonable housing and are often seen to be key prerequisites for family formation and childbearing in contemporary Europe (Hobcraft and Kiernan 1995, Kravdal 1999). Unemployment and employment instability are perhaps the most salient consequences of economic recession. Employment instability has multiple forms, including an increased risk of involuntary part-time work and time-limited work contracts, need of changing employer or a threat of downward job mobility.

### **5.1 The influence of unemployment**

The expanding literature on the effects of unemployment on childbearing suggests that experiencing unemployment leads to different childbearing propensity for men and women.

Among the childless men, being unemployed or being out of the labor force is negatively affecting the propensity to become a father. This finding is consistently repeated in many studies of individual countries (e.g., Simó Noguera et al. 2002 for Spain, Kravdal 2002 for Norway, Lundström 2009 for Sweden) as well as in a comparative analysis for 14 industrialised countries (Mills et al. 2005).

Because a vast majority of women interrupt work after giving birth to a child and the maternity and parental leave allowances usually do not fully compensate for their lost wage, males' 'breadwinning capacity' remains of paramount importance for couples' childbearing decisions. In addition, most men still earn more than their partners and unemployment, low income or unstable job position make them unattractive for marriage or long-term partnership (Oppenheimer 1994). The idea that the loss of a man's income is a central factor in couples' childbearing decision is supported by Schmitt (2008), who finds that the negative impact of unemployment on the likelihood of becoming a father in France, Finland, and Germany was eliminated when net monthly income, welfare transfers and education attainment were controlled for.

For childless women, the situation is less clear-cut. Many studies find that women who finished education and are not in formal employment have a higher likelihood of giving birth (e.g., Francesconi and Golsch 2005 for the United Kingdom; Simó Noguera et al. 2002 for Spain, Meron and Widmer 2003 for France, Liefbroer 2005 for the Netherlands), but this could be explained by selectivity: some women decide not to pursue career and chose to concentrate on family life prior to conceiving a child. In contrast to men, being unemployed is often associated with elevated first birth rates (Francesconi and Golsch 2005 for the United Kingdom, Andersson 2000 for Sweden, Schmitt 2008 for Finland, Germany and the United Kingdom), although in a number of countries negative relationship has been found (e.g., in Norway (Kravdal 2002), and France (Meron and Widmer 2003, Schmitt 2008)). The effect of unemployment can also be differentiated by age: in Finland, unemployed women aged 20-30 had a higher likelihood of becoming mothers, whereas those above age 30 had a lower likelihood of first birth, controlling for earnings and the level of education (Vikat 2004).

Length of unemployment is an important factor in the relationship between unemployment and first birth propensity among women (Schmitt 2008). Short-term unemployment does not have a marked impact (Schmitt 2008). Long-term unemployment typically shows a strong and negative effect for men and usually also for women (Adsera 2005a), although the effect for women varies with different policies and labor market contexts.<sup>8</sup> In France, long-term unemployment was found detrimental to first births especially if it occurred after the start of the union (Meron and Widmer 2003).

Fewer studies address the effects of unemployment on higher-order childbearing, where the effects often differ from those on first births. For Norway, Kravdal (2002) showed that unemployment depressed first and second birth rates, but led to elevated third and fourth birth rates among men. Unemployed women in Finland also showed elevated third birth rates (Vikat 2004). Furthermore, the effects of unemployment are often differentiated by social status (see below). Educational and ethnic selectivity of couples that pursue a larger family size might explain some of the observed contrasts in the effect of women's unemployment on childbearing behavior (e.g., Kravdal 2002).

## **5.2 Income effects moderate the relationship between unemployment and fertility**

Some of the contrasting findings presented above point out the importance of welfare arrangements in offsetting the detrimental effects of unemployment on income of the

---

<sup>8</sup> Schmitt's (2008) analysis for five countries found a positive effect of long-term unemployment on first births among women in Germany and the United Kingdom (the effect was negative or neutral for men).

prospective parents. If the main effect of unemployment is an income loss, then generous unemployment benefits or relatively high parental leave allowance reduce the costs of childbearing for the unemployed couples and make the experience of unemployment conducive for childbearing. This hypothesis is supported by the findings linking generous parental leave allowances to higher fertility (d'Addio and d'Ercole 2005). Andersson's (2000) analysis suggests that the relatively high first birth rates among unemployed women in Sweden are supported by both unemployment benefits and by entitlement to parental leave that amounts to 80% of their previous income. In particular, women receiving higher unemployment benefits had higher propensity to enter motherhood (Andersson 2000, p. 308).

### **5.3 The varied effects of uncertainty and anomie**

People experience uncertainty all throughout their lives and not only in times of economic recessions. The impact of uncertainty on fertility is contextual and differs in time, across countries, by type of uncertainty, and across population groups. Reactions to uncertainty are likely to be moderated by cultural factors (Bernardi et al. 2008) and differentiated by social status. Uncertainty may raise fertility in poor countries, where children act as providers of care and resources at old age, but it is likely to lower fertility in countries where a substantial income is guaranteed through public transfer systems in old age (Sinn 1998).

The impact of uncertainty on fertility in the developed countries has been addressed in a relatively few empirical studies, especially for Central and Eastern Europe. Therefore, the wealth of theoretical arguments has not yet been properly tested (see Mills and Blossfeld 2005 for a discussion of different types of uncertainty). High levels of uncertainty are frequently expected to have a negative influence on childbearing decisions. On a general level, McDonald (2002: 430) posits that market capitalism with diminished welfare support leads to mode competitiveness and increased economic risks to individuals, who adopt 'risk-averse' behaviors and refrain from reproduction. With respect to labor market position, unstable or temporary work has a detrimental effect on fertility (e.g., Adsera 2005a for European countries and Lundström 2009 for first births in Sweden) and on fertility intentions of women (Pailhé 2009 for France and Germany; the finding was not confirmed for Russia).

Bernardi et al. 2008 outline two main hypotheses concerning the effects of uncertainty: the *insecurity* hypothesis perceives work-related economic uncertainty as a factor stimulating postponement of long-term commitments, including parenthood. The *uncertainty reduction* hypothesis emphasizes biographical rather than economic uncertainty as a major consequence of job instability and stresses alternative ways of coping with uncertainty. A widely cited argument by Friedman et al. (1994) suggests that having children may serve as a strategy to reduce biographical uncertainty:

“The principle global strategies available to ordinary individuals in the US in the 1990s are stable careers, marriage, and children [...] the impetus for parenthood is greatest among those whose alternative pathways for reducing uncertainty are limited or blocked. [...] Having a child changes life from uncertain to relatively certain.”

Ogawa (2003) analyzed responses of married women in Japan to the question whether their childbearing decisions have been affected by the economic recession and restructuring of the 1990s. Three out of ten, especially lower-educated, women reported being at least somewhat affected. However, they differed from those unaffected only in their second birth progression rate, which was by 8% lower (0.82 as compared with 0.90).

More research has been undertaken on Central and Eastern Europe. Ranjan (1999) presented a theoretical model suggesting that declining fertility in Central and Eastern Europe was an

‘optimal reaction’ to income uncertainty arising during the economic transition. Conrad et al. (1996) argued that sudden uncertainty about the future resulted in a temporary avoidance of marriage and childbearing in East Germany after the German unification in October 1990. More nuanced results come from the studies analyzing individual data. Bhaumik and Nugent (2002) analyzed two types of uncertainty on childbearing among East and West German women in 1992-2002. Household worries about financial prospects were not significantly linked to childbearing, but self-assessed employment uncertainty had a U-shaped effect in East Germany, with women in the middle of the uncertainty scale having the lowest likelihood of childbearing. Kreyenfeld (2005 and 2009) used German panel data for the period 1984-2006 to study both ‘objective’(unemployment, low income) and ‘subjective’ measures of uncertainty (economic worries, life satisfaction). She demonstrated that the impact of both types of uncertainty measures did not significantly alter first birth rates when all women were considered, but the reaction to uncertainty sharply differed by education (see below).

Severe economic crises, such as those experienced in some post-communist countries of Europe may result in widespread feelings of anomie and cause distress, anxiety, and depression (see Philipov 2003 and Philipov et al. 2006 and Perelli-Harris 2006 for a discussion of their effects on fertility intentions and fertility). Perelli-Harris (2006) found that subjective well-being (as measured by life satisfaction and future outlook) had a strongly positive effect on childbearing desires and actual childbearing of married women with at least one child. Their husbands’ subjective well-being had, however, a significant positive effect on the intentions only. Economic uncertainty also exercises its influence on fertility indirectly. An important intermediary factor is the availability of support from individuals’ social network—social capital. When a person may rely on the help of relatives, friends and colleagues, the effect of uncertainty is likely to be lower. Philipov (2003; see also Bühler and Philipov 2005) supported this finding for Bulgaria and Russia; Bühler and Frątczak (2008) for Poland, and Philipov et al. (2006) for Bulgaria and Hungary.

#### **5.4 Social differences in first birth patterns likely to increase**

Women and men with different social background, especially in terms of education attainment, often react differently to the economic recession. Low-educated and low-skilled men, who are most affected by the recession are likely to show the largest decline in first birth rates. Given the importance of male income and stable job position for partnership and family formation (Oppenheimer 1994), many of them will not be able to find a stable partner. Oppenheimer et al. (1997) emphasize that the factors that constitute an obstacle for marriage among men often form a package of low education, stopgap employment, part-time jobs, and low earnings. All these effects are likely to be exacerbated during economic recession.

For women, the evidence suggests that highly educated react to employment uncertainty by adopting a postponement strategy, especially if they are childless, whereas the lower educated often increase or retain their rate of entry into motherhood under economic uncertainty. This conjecture is supported by the findings on the persistence of early childbearing pattern among the most disadvantaged women (in terms of their education, income, or labor market position) in Central and eastern Europe during the period of economic transition (e.g., Kharkova and Andreev 2000, Kohler and Kohler 2002 and Gerber and Cottrell 2006 for Russia, Kantorová 2004 for the Czech Republic, Kreyenfeld 2009 for East Germany, Perelli-Harris 2008 for Ukraine). In Finland during the recession in the early 1990s women with low education have shown a higher tendency to have a child when unemployed (Vikat 2004). Kreyenfeld’s (2005 and 2009) studies are particularly important in analyzing differential response to uncertainty. She shows that, in line with intuitive expectations, unemployment, economic worries and low

levels of life satisfaction lead to a strong reduction in first births among the highly educated women (i.e., those with a secondary school exam qualifying for university education). However, among the lowest-educated women (i.e., those with completed or incomplete primary education), there is an insignificant *positive* affect of economic worries and low life satisfaction on first births and a strongly significant *positive* effect of unemployment on first birth risks.

### **5.5 Opportunity costs of childbearing will be differentiated by social status**

Findings on social status differentiation in fertility response to economic recession suggest that the opportunity costs of childbearing differ between social groups and cast doubt on the general validity of the intuitively clear idea that uncertainty causes postponement of births. During a recession, better-educated women are motivated to increase their labor market attachment and postpone childbearing due to fear of losing their job and jeopardizing progress in their work career. Given that women still bear most of the time costs associated with childrearing, women with higher occupational position and high wage face higher opportunity costs than those with low income potential (Schultz 1974, Becker 1981, Gustafsson and Kalwij 2006). In contrast, among the women with lower education and income and limited chances on the labor market, the crisis often makes parenthood relatively more affordable compared to the alternative of low-wage work or unemployment. Childbearing could become a 'strategy' to structure their life (Friedman et al. 1994) and to receive financial support from the welfare system, especially when cash-transfers to women with children are substantial. In such cases, lower-educated women are likely to find childcare subsidies more attractive in times of crisis, increase their fertility, and further lower their labor market attachment as a result (see also OECD 2009b). Thus, a recession may widen socio-economic differentials in childbearing, stimulating a rise in childbearing rates among the lower educated and a reduction in fertility among the higher educated. The same case can be made for many migrants as the skill distribution of migrant populations in most European countries tends to be skewed towards lower education levels (OECD 2007, UNESCO 2009) and migrants' employment is often sensitive to fluctuations in the labor market.

The introduction of cash-for-care subsidy in Norway in 1998 provided a possibility to study the effects of changing opportunity costs on fertility of different social groups. Aassve and Lappegård (2009) conclude that the take-up was highest among the low educated, low earners and among immigrants.

### **5.6 Lower housing availability may lead to delayed family formation**

Availability of housing and the character of the housing market are related to family formation (see Rindfuss and Brauner-Otto 2008 for a succinct review). While average disposable income growth for young adults has been slow in recent decades, housing prices have risen considerably, often more than doubling from early 1990s levels (OECD 2005). The consequence of rising housing costs is often postponed and depressed fertility (Mulder 2006, Rindfuss and Brauner-Otto 2008, Curtis and Tamura 2008), especially in the countries with limited social and rental housing where home ownership constitutes a precondition for family formation. Until 2007, economic prosperity and availability of cheap credit and mortgage had to some extent counterbalanced the negative effects of rising housing costs: Cheap credit fuelled housing construction boom in many countries and encouraged many couples to acquire spacious apartments and houses. Since living in spacious housing and more child-friendly environment has been associated with higher fertility (Kulu and Vikat 2007, Ström

2009), boom in housing construction could have contributed to the rising fertility in the early 2000s (Leland 2008 suggested this link in the *New York Times*).

The development of housing prices during the recession has in most countries so far depicted only a modest decline in comparison with the increases observed in the last two decades (Global Property Guide 2009, Goldman Sachs 2008). House ownership often entails huge initial debt, which is difficult to repay in times of economic uncertainty. In addition, mortgages became more difficult to obtain as credit conditions tightened at the beginning of the recent economic downturn, and the construction of new houses plummeted, signaling further a declined availability of new housing. On balance, we expect that in most countries the negative effects of lower disposable income, lower construction activity and less available mortgages will outweigh the positive effect of cheaper housing on fertility rates and may stimulate birth postponement during the recession.

### **5.7 Economic recession likely to prolong time in education and thus delay childbearing**

Lacking employment opportunities are likely to contribute to a prolongation of time spent in education as the value of human capital increases in a competitive labor market and education reduces the risk of unemployment and employment instability (Abowd and Lemieux 1993, Kohler et al. 2002). Many young people will aim to improve their work opportunities or simply enroll in education because being a student can involve a higher social status than being unemployed or out of the workforce (Dornbusch et al. 2000). This latter strategy is also consistent with the ‘uncertainty reduction hypothesis’ by Friedman et al (1994), discussed above. In Italy, Spain, Sweden and in Central and Eastern Europe education system expanded rapidly and the numbers of young people enrolled at universities surged during the economically unstable times of the 1980s and 1990s (e.g., Hoem 2000, Kohler et al. 2002, Kotowska et al. 2008).

Further expansion of tertiary education could lead to later and fewer births as better-educated women tend to have elevated childlessness and lower fertility rates (Blossfeld and Huinink 1991, Skirbekk 2008). Billari et al. (2000, p. 37) emphasize that leaving school typically affects the timing of family formation: “Having left full time education – or at least having left the parental home – seems to be a necessary condition for entering a steady cohabiting partnership.” Skirbekk et al. (2004), using birth month as a source of exogenous variation in the school leaving age, find that a later age at graduation causes a higher age at first childbirth.

### **5.8 Young adults will be most affected by the recession**

Young adults have in recent decades taken the brunt of pension system and labor market reforms, which has weakened their economic situation and made them particularly vulnerable to the current crisis. Examples include the labor market liberalization in Spain, creating an ‘insider-outsider’ labor market, where older workers enjoy a much greater degree of employment protection (de la Rica and Iza 2005) or the pension reforms in Norway that leave a heavier financial and retirement burden on the younger cohorts. Across Europe, younger people have been exposed to increasingly precarious, lower-paid, and lower-quality employment, giving them more uncertain future prospects (Mills et al. 2005). During recessions, employment instability rises especially fast among the young adults (Aaberge et al. 1997, Schmähl 2003, Verick 2009). The economic crisis implies fewer new hirings and a complete hiring freeze in many firms and institutions. The often practiced “last in, first out”

principle, where workers with shorter job tenure are asked to leave their job first, further tends to worsen the employment situation of the young (Oswald 1987).

The relative worsening of economic position of young adults is likely to lead to delayed residential independence, decreased life satisfaction, diminished perception of success in life and increased frustration due to unfulfilled material aspirations (e.g., Clark and Oswald 1996). Lutz, Skirbekk and Testa (2006) argue that the gap between income aspirations and expected or actual income is a key determinant for the delay of family formation, as many wait to have children until they have secured an *adequately high economic level*. Income aspirations are largely set by the income of the parental generation (Easterlin 1980) and therefore declining relative earnings of the young increase the gap between their economic aspirations and actual income. All in all, we expect that the fertility reaction to the economic recession will be most pronounced among the younger people and among the childless who usually plan to accumulate substantial resources before having children.

## **6 Conclusions and policy recommendations**

### **6.1 Summary of major findings**

The evidence is not unanimous, but most studies find that fertility tends to be pro-cyclical and react on the ups and downs of the business cycle. These waves are often relatively minor (typically, by a few percentage points) and of relatively short duration. Therefore, they can be overshadowed by long-term secular trends in fertility that were induced by other factors than economic recession. This may explain why a number of studies on fertility during the times of the Great Depression of the 1930s and again in the 1970s could not find a convincing link between the recession and fertility swings: both periods saw a continuation of long-term fertility declines that started well before the recession began. The short-term fertility decline during the recession is frequently interpreted as a result of childbearing postponement. In today's terminology we can say that the recession mainly leads to a 'tempo effect' and only a minor, if any, quantum decline in fertility. However, no research until now has attempted a delineation of these two components of fertility during the times of economic crises.

Trends in fertility rates often show correlation with the GDP growth. Our simple analyses have illustrated this relationship for low-fertility countries after 1980: Periods of economic recession or stagnation were frequently followed within one or two years by a slight decline in the period fertility rates. However, measures of unemployment and consumer sentiments appear to be more suitable indicators that reflect more closely the impact of the crisis on individuals and that were repeatedly found related to fertility swings. At an individual level, we discussed a number of interrelated factors and mechanisms that do not affect fertility in isolation and whose effect is often difficult to single out: experiences of unemployment and work instability, declining wages, rising economic uncertainty and anomie, difficulties in acquiring adequate housing, and spending more time in education. Perhaps the most important reason for why the recession is likely to lead to a downward pressure on fertility is the rise in unemployment and job instability, which particularly affects young adults. We have argued that this group will be hardest hit by the recession and that the fertility reaction to the recession may also be strongest in this group. Furthermore, our discussion of opportunity costs of childbearing pointed out that especially the more educated women may perceive childbearing as a risky strategy during the recession and are likely to react by postponing their reproductive plans. Especially their first birth decisions may be put off until better times. In

contrast, among men the lowest-educated ones with precarious work position may face more difficulties in finding a partner to start a family.

Overall, the current recession is likely to have some depressing effect on childbearing and push period fertility rates that are generally considered too low (Lutz and Skirbekk 2005, UN 2004, Miettinen et al. 2008) to somewhat lower levels in the next 3-5 years. In many countries where the period TFR was rising after 2000, the recession may lead to a halting or even to a temporary reversal of this trend. In some cases, this may also imply a brief return of the ‘lowest-low fertility’ (the period TFR below 1.3), a phenomenon that had briefly affected about a half of European populations in the late 1990s and the early 2000s (Kohler et al. 2002, Goldstein et al. 2009). Projected data on live births in 2009 based on incomplete evidence, provided by Eurostat in January 2010, clearly illustrate the initial impact of the recession in Europe. In 2008, the number of live births increased in all the countries of the European Union except Germany. In 2009, in contrast, a decline in total births is projected for 14 out of 27 EU countries. The estimate for the whole EU envisions a decline in total births in 2009 by 0.1% as compared with a rise of 2.7% in 2008.

These preliminary data fall in line with our expectation of a moderate downward fertility trend prevailing for a limited period of time. Only if the economic recession and the resulting high unemployment became protracted—as was the case during the ‘lost decade’ in Japan in the 1990s—its fertility impact would also become more durable and could potentially affect cohort fertility rates. In any case, the effects of recession will not be universal and unidirectional since institutional factors and policies intervene at every step in the relationship between economic downturn and fertility behaviour.

## **6.2 Policies to ease the situation of families during the economic crisis**

The relationship between economic recession and fertility is contingent upon social and institutional arrangements. Public support may mitigate the adverse effects of the crisis on fertility. Matysiak and Vignoli’s (2008) meta-analysis on the relation between employment and fertility finds that the conflict between employment and family is relatively low in the social-democratic and (the former) socialist welfare regimes, possibly due to the strong institutional support to working mothers. Moreover, in the social democratic (Nordic) welfare regime, the difficulties in combining employment and childrearing are reduced not only by generous childcare leave provision, but also by positive attitudes towards working mothers. Government policies *can* be effective in softening or even reversing the depressing effects of the recession on fertility.

Finland constitutes a telling example of a policy that (unintentionally) led to a slight rise in period fertility at the time of a deep economic recession in the early 1990s. The introduction of home-care child allowance to parents who stay at home with their child below 3 years of age in the mid-1980s provided an attractive alternative to unemployment and shrinking work opportunities for many women (Vikat 2004). Most recently, a slight rise in fertility rates in Iceland despite severe economic recession in the first half of 2009 generated media attention, which pointed the ‘smoking gun’ towards generous parental leave (e.g., Moorhead 2009).

Policies have an important symbolic function, giving signals about ‘desirable’ behaviour and therefore cutbacks in family-related spending may be considered as “signals about the hard times to come, and they will add to adverse economic trends in creating a pessimistic climate of opinion conducive to postponement of childbearing” (Hoem 2000). At the same time, some well-intended policies may be counter-productive if unemployment and employment uncertainty remain too high for a long period of time. Very long parental leave periods may be detrimental to fertility rates (d’Addio and d’Ercole 2005), perhaps because long periods

away from employment entail high opportunity costs of childbearing for many women and hamper their career prospects. Policies strengthening employment protection of full-time (and usually male) employees may in effect worsen employment prospects of the unemployed, of the young entrants on the labour market, and of those in part-time and precarious jobs and, in affect, hamper fertility (Adsera 2005b).

In particular, governments should pursue policies that help women and younger people acquiring and keeping employment with reasonable career prospects, even if this would reduce job protection among the senior employees. Current policies in most countries do not seem to work in this respect: Individuals in their 20s and 30s have experienced growing poverty levels in the two decades preceding the current crisis at the same time as individuals in their 50s and 60s have been increasingly better off (OECD 2008, Vogel and Råbäck. 2004).

We conclude this note with the following policy recommendation: Reducing unemployment growth, especially of long-term unemployment, and making labour market more open and flexible for younger people is the most important way how the potentially detrimental effect of the recession can be mitigated.

## References

- Aaberge, R., A. Björklund, M. Jäntti, P.J. Pedersen, N. Smith, and T. Wennemo. 1997. "Unemployment shocks and income distribution. How did the Nordic countries fare during their crises?" *Discussion Papers* No. 201, Statistics Norway, Research Department.
- Aassve, A., F. C. Billari, and Z. Spéder. 2006. "Societal transition, policy changes and family formation: Evidence from Hungary" *European Journal of Population* 22(2): 127-152.
- Aassve, A. and T. Lappegård. 2009. "Childcare cash benefits and fertility timing in Norway." *European Journal of Population* 25(1): 67-88.
- Abowd, J.A. and T. Lemieux. 1993. "The effects of product market competition on collective bargaining agreements: the case of foreign competition in Canada," *Quarterly Journal of Economics* 108: 983-1014.
- Adsera, A. 2004. "Changing fertility rates in developed countries. The impact of labour market institutions." *Journal of Population Economics* 17(1): 1-27.
- Adsera, A. 2005a. "Where are the babies? Labour market conditions and fertility in Europe." *IZA Discussion Paper* 1576, Bonn: Institute for the Study of Labour.
- Adsera, A. 2005b. "Vanishing children: From high unemployment to low fertility in developed countries." *American Economic Review, Papers and Proceedings*, 95(2): 189-193.
- Adsera, A. and A. Menendez. 2009. "Fertility changes in Latin America in the context of economic uncertainty." *IZA Discussion Paper* 4019, Bonn: Institute for the Study of Labour.
- Ahn, N. and P. Mira. 2001. "Job bust, baby bust? Evidence from Spain". *Journal of Population Economics* 14: 505-521.
- Andersson, G. 2000. "The impact of labour-force participation on childbearing behaviour: Pro-cyclical fertility in Sweden during the 1980s and the 1990s". *European Journal of Population* 16(4): 293-333.
- Andersson, G. 2001. "Fertility developments in Norway and Sweden since the early 1960s." *MPIDR Working Papers* WP 2001-620.
- Andorka, R. 1978. *Determinants of fertility in advanced societies*. London: Methuen & Co.
- Baizán, P., F. Michielin, and F. C. Billari. 2002. "Political economy and life course patterns: The heterogeneity of occupational, family, and household trajectories of young Spaniards". *Demographic Research* 6 (Article 8): 191-240.

- Becker, G.S. 1960. "An economic analysis of fertility." In: *Demographic and Economic Change in Developed Countries*, Universities-National Bureau, UMI, pp. 225-256.
- Becker, G.S. 1981. *A Treatise on the Family*. Harvard University Press.
- Bengtsson, T., C. Campbell, and J.Z. Lee (eds.) 2004. *Life Under Pressure: Mortality and Living Standards in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Berkowitz-King, R. 2005. "The case of American women: Globalization and the transition to adulthood in an individualistic regime." Chapter 12 in: H.-P. Blossfeld, E. Klijzing, M. Mills and K. Kurz (eds.) *Globalization, Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series, pp. 305-325.
- Bernardi, L., A. Klärner and H. von der Lippe. 2008. "Job insecurity and the timing of parenthood: A comparison between Eastern and Western Germany." *European Journal of Population* 24: 287-313.
- Bhaumik, S. and B. Nugent. 2002. "Does economic uncertainty have an impact on decisions to bear children? Evidence from Eastern Germany." *MPIDR Working Papers* WP-2002-037, Max Planck Institute for Demographic Research, Rostock.
- Billari, F. C. and H.-P. Kohler. 2004. "Patterns of low and very low fertility in Europe". *Population Studies* 58 (2): 161-176.
- Billari, F., P. Manfredi, and A. Valentini. 2000. "Macro-demographic effects of the transition to adulthood: Multistate stable population theory and an application to Italy." *Mathematical Population Studies* 9(1): 33-63.
- Billingsley, S. 2009. "The post-communist fertility puzzle." *Population Research and Policy Review*, Online First, DOI: 10.1007/s11113-009-9136-7.
- Blossfeld, H.-P. and J. Huinink. 1991. "Human capital investments or norms of role transition? How women's schooling and career affect the process of family formation." *American Journal of Sociology* 97: 143-68.
- Bongaarts, J. and G. Feeney. 1998. "On the quantum and tempo of fertility". *Population and Development Review* 24 (2): 271-291.
- Brunborg, H, D. Fredriksen, N.M. Stølen and I. Texmon. 2008. "Utviklingen i levealder og utforming av delingstall I reformert pensjonssystem." *Statistics Norway Reports* 2008/23.
- Bühler, C. and E. Frątczak. 2005. "Learning from others and receiving support. The impact of personal networks on fertility intentions in Poland." *MPIDR Working Papers* WP-2005-017, Max Planck Institute for Demographic Research, Rostock.
- Bühler, C. and D. Philipov. 2005. "Social capital related to fertility: theoretical foundation and empirical evidence for Bulgaria." *Vienna Yearbook of Population Research* 2005: 53-82.
- Butz, W.P. and M.P. Ward. 1979a. "The emergence of countercyclical U.S. fertility." *The American Economic Review* 69(3): 318-328.
- Butz, W.P. and M.P. Ward. 1979b. "Will US fertility remain low? A new economic interpretation." *Population and Development Review* 5(4): 663-688.
- Caldwell, J.C. 2008. "Three fertility compromises and two transitions." *Population Research and Policy Review* 27: 427-446.
- Caldwell, J.C. 2006. "The Western fertility decline: Reflection from a chronological perspective." *Journal of Population Research* 23(2): 225-242.
- Campbell, A.A. 1978. "Baby boom to birth dearth and beyond." *Annals of the American Academy of Political and Social Science*, Vol. 435: *America in the Seventies: Some Social Indicators*, pp. 40-60
- Castro Martín, T. 1992. "Delayed childbearing in contemporary Spain: trends and differentials." *European Journal of Population* 8: 217-246.
- Chang, M.C. 2006. "Taiwan's transition from high fertility to lowest-low levels." *Asian Journal of Health and Information Sciences* 1(1): 1-15.
- Clark, A.E. and A.J. Oswald. 1996. "Satisfaction and comparison income." *Journal of Public Economics* 61: 359-381.

- Conrad C., M. Lechner, and W. Werner. 1996. "East German fertility after unification: Crisis or adaptation?" *Population and Development Review* 22 (2): 331-358.
- Council of Europe. 2006. *Recent demographic developments in Europe 2005*. Strasbourg: Council of Europe Publishing.
- Curtis, S. and R. Tamura. 2008. "Do higher rents discourage fertility? Evidence from U.S. cities, 1940-2000." *MPRA Paper* No. 7721. [<http://mpra.ub.uni-muenchen.de/7721/>]
- Cutright, P. and Shorter, E. 1979. "The effects of health on the completed fertility of nonwhite and white U.S. women born from 1867 through 1935." *Journal of Social History* 13(2): 191-218.
- d'Addio, A.C. and M.M. d'Ercole. 2005. "Trends and determinants of fertility rates: The role of policies." *OECD Social, Employment, and Migration Working Papers* 27, Paris: OECD.
- De Cooman, E., J. Ermisch, and H. Joshi. 1987. "The next birth and the labour market: A dynamic model of births in England and Wales." *Population Studies* 41(2): 237-268.
- De Beer, J. 1991. "Geboorteontwikkeling wordt beïnvloed door vertrouwen in de economie." [Birth trends are affected by confidence in the economy]. *Maandstatistiek van de Bevolking* 39(9): 25-30.
- De Jong, A. 1997. "Achergronden van vruchtbaarheidsontwikkelingen." [Variables influencing fertility development]. *Maandstatistiek van de Bevolking* 45(10): 12-24.
- De la Rica, S. and A. Iza, 2005. "Career planning in Spain: Do fixed-term contracts delay marriage and parenthood?" *Review of the Economics of the Household* 3: 49-73.
- Dornbusch, R., A. Gentilini and F. Giavazzi. 2000. "Italian labour force participation: Disguised unemployment on campus." Presentation at the Annual Meeting of the European Economics Association, Bolzano. [[http://www.igier.unibocconi.it/whos.php?vedi=1046&btn=albero&id\\_doc=177](http://www.igier.unibocconi.it/whos.php?vedi=1046&btn=albero&id_doc=177)].
- Easterlin, R.A. 1976. "The conflict between aspirations and resources." *Population and Development Review* 2(3-4): 417-425.
- Easterlin, R.A. 1973. "Relative economic status and the American fertility swing." In: Sheldon, E.B. (ed.) *Family economic behavior: problems and prospects*. Philadelphia, Pennsylvania: J.B. Lippincott, pp. 170-227.
- Easterlin, R.A. 1980. *Birth and Fortune: The Impact of Numbers on Personal Welfare*. New York: Basic Books.
- Eloundou-Enyegue, P.F., C. S. Stokes and G. T. Cornwell. 2000. "Are there crisis-led fertility declines? Evidence from central Cameroon." *Population Research and Policy Review* 19(1): 47-72.
- Eun, K.-S. 2003. "Understanding recent fertility decline in Korea." *Journal of Population and Social Security (Population)*, Suppl. to Vol. 1, 574-594.
- Eurostat. 2008. *Population and Social Conditions*. Online database accessed in May 2008 at [<http://epp.eurostat.ec.europa.eu>].
- Eurostat. 2009. *The EU-27 population continues to grow. Data in Focus*, 31/2009, Eurostat.
- Eurostat. 2010. Eurostat online statistical database. Accessed 15 January 2010 at [[http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)].
- Fallagas, M.E., E.K. Vouloumanou, M.N. Mavros, and D.E. Karageorgopoulos. 2009. "Economic crises and mortality: A review of the literature." *The International Journal of Clinical Practice* 63(8): 1128-1135.
- Festy, P. 1979. *La fécondité des pays occidentaux de 1870 à 1970*. Travaux et Documents No. 85. Paris: INED – PUF.
- Fokkema, T., H. de Valk, J. de Beer, and C. van Duin. 2008. "The Netherlands: Childbearing within the context of a "Poldermodel" society." *Demographic Research*, Special Collection 7, Vol. 19(Article 21): 743-794.
- Francesconi, F. and K. Golsch. 2005. "The process of globalization and transitions to adulthood in Britain." Chapter 10 in: H.-P. Blossfeld, E. Klijzing, M. Mills and K. Kurz (eds.) *Globalization*,

- Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series, pp. 249-276
- Frejka, T. 2008. "Determinants of family formation and childbearing during the societal transition in Central and Eastern Europe." *Demographic Research*, Special Collection 7, Vol. 19(Article 7): 139-170.
- Friedman, D., M. Hechter, and S. Kanazawa. 1994. "A theory of the value of children". *Demography*, 31 (3): 375-401.
- Gerber, T.P. and E.B. Cottrell. 2006. "Fertility in Russia, 1985-2001. Insights from individual fertility histories." Paper presented at the Annual Meeting of the Population Association of America, Los Angeles, March 2006.
- Global Property Guide. 2009. Property price change statistics in European countries accessed on July 2, 2009 at: [<http://www.globalpropertyguide.com/Europe/>]
- Goldin, C. and L.F. Katz. 2002. "The power of the pill: Oral contraceptives and women's career and marriage decisions." *The Journal of Political Economy* 110(4): 730-770.
- Goldman Sachs. 2008. *Global Economics Weekly*, April 16 and May 14, 2008.
- Goldstein, J.R., T. Sobotka, and A. Jasilioniene. 2009. "The end of lowest-low fertility?" *Population and Development Review* 35(4): 663-700.
- Greenwood, J., A. Shesadri, and G. Vandenbroucke. 2006. "The baby boom and baby bust." *The American Economic Review* 95(1): 183-207.
- Gustafsson, S. and A. Kalwij. 2006. *Education and Postponement of Maternity. Economic Analysis for Industrialized Countries*. European Studies of Population, Vol. 15, Kluwer Academic Publishers / Springer.
- Historical Statistics. 2009. Online database of macroeconomic data for Sweden. Accessed in July 2009 at [[www.historicalstatistics.org](http://www.historicalstatistics.org)].
- Hobcraft, J. 1996. "Fertility in England and Wales: A fifty-year perspective." *Population Studies* 50(3): 485-524.
- Hobcraft, J. and K. Kiernan. 1995. "Becoming a parent in Europe." *Discussion Paper WSP/116*, London School of Economics, Toyota Centre, Welfare State Programme.
- Hoem, B. 2000. "Entry into motherhood in Sweden: The influence of economic factors on the rise and fall in fertility, 1986-1997." *Demographic Research* 2, Article 4.
- Hoem, B. and J.M. Hoem. 1996. "Sweden's family policies and roller-coaster fertility." *Journal of Population Problems* 52(3-4): 1-22. [<http://www.ipss.go.jp/syoushika/bunken/data/pdf/16896401.pdf>].
- Huang, J.-T. 2003. "Unemployment and family behaviour in Taiwan." *Journal of Family and Economic Issues* 24(1): 27-48.
- Jones, G.W. 2007. "Delayed marriage and very low fertility in Pacific Asia." *Population and Development Review* 33(3): 453-478.
- Kaneko, R., A. Ishikawa, F. Ishii, T. Sasai, M. Iwasawa, F. Mita, and R. Moriizumi. 2008. "Population projections for Japan: 2006-2055. Outline of results, methods, and assumptions." *The Japanese Journal of Population* 6(1): 76-114.
- Kantorová, V. 2004. Family life transitions of young women in a changing society: First union formation and birth of first child in the Czech Republic, 1970-1997. Doctoral thesis, Charles University in Prague and Université de Paris I – Pantheon – Sorbonne.
- Kharkova, T. and E. Andreev. 2000. "Did the economic crisis cause the fertility decline in Russia: Evidence from the 1994 Microcensus." *European Journal of Population* 16(3): 211-233.
- Kim, D.-S. 2008. "The 1997 Asian economic crisis and changes in the pattern of socioeconomic differentials in Korean fertility." In: P. Straughan, A. Chan and G. Jones (eds.) *Ultra-low Fertility in Pacific Asia*. Routledge, Oxon and New York.
- Kirk, D. and D.S. Thomas 1960. "The influence of business cycles on marriage and birth rates." In: *Demographic and Economic Change in Developed Countries*, Universities-National Bureau, UMI, pp. 257-276. [<http://www.nber.org/books/univ60-2>].

- Kiser, C.V. and P.K. Whelpton. 1953. "Resume of the Indianapolis study of social and psychological factors affecting fertility." *Population Studies* 15: 95-110
- Klasen, S. and A. Launov. 2006. "Analysis of the determinants of fertility decline in the Czech Republic". *Journal of Population Economics* 19(1): 25-54.
- Kohler, H.-P. and I. Kohler. 2002. "Fertility decline in Russia in the early and mid 1990s: The role of economic uncertainty and labour market crisis." *European Journal of Population* 18(3): 233-262.
- Kohler, H.-P., F. C. Billari, and J.A. Ortega. 2002. "The emergence of lowest-low fertility in Europe during the 1990s." *Population and Development Review* 28(4): 641-680.
- Kotowska, I., J. Józwiak, A. Matysiak, and A. Baranowska. 2008. "Poland: Fertility decline as a response to profound societal and labour market changes?" *Demographic Research, Special Collection 7, Vol. 19(Article 22)*: 795-853.
- Kravdal, Ø. 1994. "The importance of economic activity, economic potential and economic resources for the timing of first births in Norway." *Population Studies* 48(2): 249-267.
- Kravdal, Ø. 1999. "Does marriage require a stronger economic underpinning than informal cohabitation?" *Population Studies* 53(1): 63-80.
- Kravdal, Ø. 2002. "The impact of individual and aggregate unemployment on fertility in Norway." *Demographic Research* 6(10): 263-294.
- Kreyenfeld, M. 2005. "Economic uncertainty and fertility postponement. Evidence from German panel data." *MPIDR Working Papers WP 2005-034*.
- Kreyenfeld, M. 2009. "Uncertainties in female employment careers and the postponement of parenthood in Germany." *European Sociological Review*, Advance Access; DOI: 10.1093/esr/jcp026.
- Kulu, H. and A. Vikat. 2007. "Fertility differences by housing type: the effect of housing conditions or of selective moves?" *Demographic Research* 17(26): 775-802.
- Lee, R. 1990. "The demographic response to economic crisis in historical and contemporary populations." *Population Bulletin of the United Nations* 1990 (29):1-15.
- Leland, J. 2008. "From the housing market to the maternity ward." *New York Times*, February 1, 2008. Accessed at: [<http://www.nytimes.com/2008/02/01/us/01birth.html>].
- Lesthaeghe, R. 1983. "A century of demographic and cultural change in Western Europe: An exploration of underlying dimensions." *Population and Development Review* 9(3): 411-435.
- Lesthaeghe, R. 1995. "The second demographic transition in Western countries: An interpretation". In: K.O. Mason and A.-M. Jensen (eds.) *Gender and family change in industrialized countries*. Oxford, Clarendon Press, pp. 17-62.
- Liefbroer, A.C.. 2005. "Transition from youth to adulthood in the Netherlands." Chapter 4 in: H.-P. Blossfeld, E. Klijzing, M. Mills and K. Kurz (eds.) *Globalization, Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series, pp. 83-103.
- Lundström, K.E. 2009. "Labour market status and fertility behaviour for Swedish and foreign-born men and women." Paper presented at the workshop on "Economic uncertainty and fertility dynamics," Berlin, 3-4 July, 2009
- Lutz, W. and V. Skirbekk. 2005. "Policies Addressing the Tempo Effect in Low Fertility Countries." *Population and Development Review* 31(4): 699-720.
- Lutz, W., V. Skirbekk, and M. R. Testa. 2006. "The low fertility trap hypothesis. Forces that may lead to further postponement and fewer births in Europe." *Vienna Yearbook of Population Research* 2006: 167-192.
- Macunovich, D.J. 1996. "Relative income and the price of time: Exploring their effects on US fertility and female labor force participation." In: J. B. Casterline, R. D. Lee, and K. A. Foote (eds.) *Fertility in the United States. New patterns, new theories*. Supplement to *Population and Development Review* 22, New York, Population Council, pp. 223-257.
- Martin, J. 2004. "'The ultimate vote of confidence'. Fertility rates and economic conditions in Australia, 1976-2000." *Australian Social Policy* 2002-2003, Commonwealth of Australia, Canberra: 31-54.

- Matysiak, A. and D. Vignoli. 2008. "Fertility and women's employment: A meta-analysis." *European Journal of Population* 24: 363–384.
- Matsukura, R., R.D. Retherford, and N. Ogawa. 2007. "Declining fertility in Japan: Its mechanisms and policy responses." *Asia-Pacific Population Journal* 22(2): 33-50
- McDonald, P. 2002. "Sustaining fertility through public policy: The range of options." *Population-E* 57 (3): 417-446.
- Meron, M. and I. Widmer. 2002. "Unemployment leads women to postpone the birth of their first child". *Population-E* 2002, 57(2): 301-330.
- Miettinen, A., I. Esveldt and T. Fokkema. 2008. "Family policies: Financial or institutional measures? Preferences of childless persons and one-child parents." In: C. Höhn, D. Avamov and I. Kotowska. *People, Population Change and Policies. Lessons from the Population Policy Acceptance Study - Vol 1*. Springer Science + Business Media B. V.
- Mills, M. and H.-P. Blossfeld. 2005. "Globalization, uncertainty and the early life course. A theoretical framework." In: H.-P. Blossfeld, E. Klijzing, M. Mills and K. Kurz (eds.) *Globalization, Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series, pp. 1-24
- Mills, M., and H.-P. Blossfeld, and E. Klijzing. 2005. "Becoming an adult in uncertain times. A 14-country comparison of the losers of globalization." Chapter 17 in: H.-P. Blossfeld, E. Klijzing, M. Mills and K. Kurz (eds.) *Globalization, Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series, pp. 423-441.
- Mocan, N.H. 1990. "Business cycles and fertility dynamics in the United States." *Journal of Population Economics* 3(2)
- Moorhead, J. 2009. "The Icelandic baby boom - it's all down to economics." *The Guardian*, 18 August 2009. Accessed at [<http://www.guardian.co.uk/world/2009/aug/18/iceland-baby-boom-recession>].
- Morgan, S.P. 1991. "Late Nineteenth and early Twentieth century childlessness." *The American Journal of Sociology* 97(3): 779-807.
- Morgan, S.P. 1996. "Characteristic features of modern American fertility". In.: J. B. Casterline, R. D. Lee, and K. A. Foote (eds.) *Fertility in the United States. New patterns, new theories*. Supplement to *Population and Development Review* 22, New York, Population Council, pp. 19-63.
- Mulder, C.H. 2006, "Population and housing: A two-sided relationship." *Demographic Research* 15 (Article 13): 401-412.
- Murphy, M. 1993. "The contraceptive pill and women's employment as factors of fertility change in Britain 1963-1980: A challenge to conventional view." *Population Studies* 47(2): 221-243.
- Murphy, M. 1992. "Economic models of fertility in post-war Britain – a conceptual and statistical re-interpretation." *Population Studies* 46(2): 235-258.
- Nobles, J. and A. Bütünheim. 2006. "Marriage in periods of crisis." California Center for Population research On-Line Working papers CCPR-017-06. [[http://www.ccpr.ucla.edu/ccprwpseries/ccpr\\_017\\_06.pdf](http://www.ccpr.ucla.edu/ccprwpseries/ccpr_017_06.pdf)].
- OECD 2005. "Recent house price developments: The role of fundamentals." In: *Economic Outlook* 78. Organisation for Economic Co-operation and Development, Paris, pp. 123-150. [[www.oecd.org/dataoecd/41/56/35756053.pdf](http://www.oecd.org/dataoecd/41/56/35756053.pdf)].
- OECD. 2007. *International migration outlook: annual report*. OECD Publishing, Organisation for Economic Co-operation and Development, Paris.
- OECD 2008. *Growing Unequal. Income Distribution and Poverty in OECD Countries*. Organisation for Economic Co-operation and Development, Paris.
- OECD 2009a. Time series of the Gross Domestic Product by country extracted from the OECD database (OECD.Stat) on 25 June 2009.
- OECD 2009b. "Jobs for Immigrants. Labour Market Integration in Norway. The labour market integration of immigrants and their children in Norway." OECD: Paris. <http://www.oecd.org/dataoecd/35/17/43247521.pdf>

- Ogawa, N. 2003. "Japan's changing fertility mechanisms and its policy responses." *Journal of Population Research* 20(1): 89-106.
- Ogawa, N. and R.D. Retherford. 1993. "The resumption of fertility decline in Japan: 1973-1992." *Population and Development Review* 19(4): 703-741.
- Ogura, S. and T. Kadoda. 2008. "Labor market policies and fertility of Japanese women: Analysis of municipal data." Paper presented at the workshop at Economic Research Institute of Hitotsubashi University, June 4, 2008. [[http://cis.ier.hit-u.ac.jp/Japanese/society/Ifo-workshop0802/Japanesefertility\\_ogura\\_kadoda.pdf](http://cis.ier.hit-u.ac.jp/Japanese/society/Ifo-workshop0802/Japanesefertility_ogura_kadoda.pdf)].
- Oppenheimer, V. K. 1994. "Women's rising employment and the future of the family in industrialized societies." *Population and Development Review* 20: 293-342.
- Oppenheimer, V.K., M. Kalmijn and N. Lim. 1997. "Men's career development and marriage timing during a period of rising inequality." *Demography* 34(3): 311-330.
- Oswald, A. 1987. "Efficient contracts are on the labour demand curve: theory and facts." London School of Economics, Centre for Labour Economics, *Discussion Paper* No. 284.
- Pailhé, A. 2009. "Work-family balance and childbearing intentions in France, Germany and Russia." Paper presented at the XXVI IUSSP International Population Conference, Marrakech, Morocco, 27 September-3 October 2009.
- Palloni, A., K. Hill, and G.P. Aguirre. 1996. "Economic swings and demographic changes in the history of Latin America." *Population Studies* 50(1): 105-132.
- Perelli-Harris, B. 2008. "Ukraine: On the border between old and new in uncertain times." *Demographic Research*, Special Collection 7, Vol. 19(29): 1145-1178.
- Perelli-Harris, B. 2006. "The influence of informal work and subjective well-being on childbearing in post-Soviet Russia." *Population and Development Review* 32(4): 729-753.
- Philipov, D. 2003. "Fertility in times of discontinuous societal change". In: I. Kotowska, and J. Józwiak (eds.) *Population of Central and Eastern Europe. Challenges and Opportunities*. Statistical Publishing Establishment, Warsaw, pp. 665-689.
- Philipov, D. and J. Dorbritz. 2003. *Demographic consequences of economic transition in countries of Central and Eastern Europe*. Population Studies, No. 39, Council of Europe Publishing: Strasbourg.
- Philipov, D. and H.-P. Kohler. 2001. "Tempo effects in the fertility decline in Eastern Europe: Evidence from Bulgaria, the Czech Republic, Hungary, Poland and Russia." *European Journal of Population* 17(1): 37-60.
- Philipov, D., Z. Spéder, and F. C. Billari. 2006. "Soon, later, or ever? The impact of anomie and social capital on fertility intentions in Bulgaria (2002) and Hungary (2001)." *Population Studies* 60(3): 289-308.
- Prioux, F. 2003. "Age at first union in France: A two-stage process of change". *Population-E* 58 (4-5): 559-578.
- Ranjan, P. 1999. "Fertility behaviour under income uncertainty." *European Journal of Population* 15(1): 25-43.
- Retherford, R.D., N. Ogawa, and R. Matsukura. 2001. "Late marriage and less marriage in Japan." *Population and Development Review* 27(1): 65-102
- Rindfuss, R.R. and S.R. Brauner-Otto. 2008. "Policies, institutions, and the transition to adulthood: Implications for fertility tempo in low fertility settings." *Vienna Yearbook of Population Research* 2008: 57-87.
- Rindfuss, R.R., S.P. Morgan, and G. Swicegood. 1988. *First births in America. Changes in the timing of parenthood*. Berkeley: University of California Press.
- Rønsen, M. 2004. "Fertility and public policies – Evidence from Norway and Finland." *Demographic Research*, 10(Article 6): 143-170.
- Ryder, N. 1980. "Components of temporal variations in American fertility". In: R. W. Hiorns (ed.) *Demographic patterns in developed societies*, Symposia of the Society for the Study of Human Biology, Vol. XIX, Taylor & Francis Ltd., London, pp. 15-54.

- Santow, G. and M. Bracher. 2001. "Deferment of first birth and fluctuating fertility in Sweden." *European Journal of Population* 17: 343-363.
- Schmitt, C. 2008. "Gender-specific effects of unemployment on family formation: A cross-national perspective." DIW Berlin, *Discussion Papers* 841.
- Schultz, T. 1974. "Changing world prices, women's wages and the fertility transition: Sweden 1860-1910." *Journal of Political Economy* 93: 1126-1154.
- Simó Noguera, C., T. Castro Martin. and A. Soro Bonmati. 2005. "The Spanish case. The effects of the globalization process on the transition to adulthood." In: Blossfeld, H.-P., E. Klijzing, M. Mills and K. Kurz (Eds.) *Globalization, Uncertainty and Youth in Society*. London/New York: Routledge Advances in Sociology Series.
- Simó Noguera, C., K. Golsch, and N. Stainhage. 2003. "Increasing uncertainty in the Spanish labour market and entry into parenthood." *Genus* 58 (1): 77-119.
- Simms, C. 2009. "Economic crisis and mortality (Editorial)." *The International Journal of Clinical Practice* 63(8): 1119-1222.
- Sinn H.-W. 1998. "The Pay-As-You-Go pension system as a fertility insurance and enforcement device." *NBER Working Papers* 6610, National Bureau of Economic Research, Inc.
- Skirbekk, V. 2008. "Fertility Trends by Social Status." *Demographic Research* 18(5): 145-180.
- Skirbekk, V., H-P Kohler, and A. Prskawetz 2004. "Birth month, school graduation and the timing of births and marriages." *Demography* 41(3): 547-556.
- Schmähl, W. 2003. "Ageing workforce: Firm strategies and public policy in Germany." *Geneva Papers on Risk and Insurance* 28: 575-595.
- Sobotka, T. 2003. "Re-emerging diversity: Rapid fertility changes in Central and Eastern Europe after the collapse of the communist regimes". *Population-E* 2003, 58 (4-5): 451-486.
- Sobotka, T. 2004. *Postponement of childbearing and low fertility in Europe*. PhD Thesis, University of Groningen. Amsterdam: Dutch University Press.
- Sobotka, T. 2008a. "Does persistent low fertility threaten the future of European populations?" In: J. Surkyn, P. Deboosere and J. van Bavel and (eds.) *Demographic challenges for the 21<sup>st</sup> Century. A state of art in demography*. Brussels: VUBPRESS, pp. 27-89.
- Sobotka, T. 2008b. "The diverse faces of the second demographic transition in Europe." *Demographic Research*, Special Collection 7, Vol. 19(8): 171-224.
- Sobotka, T. and W. Lutz. 2009. "Misleading policy messages from the period TFR: Should we stop using it?" *European Demographic Research Papers* 2009-4, Vienna Institute of Demography, Vienna.
- Spengler, J.J. 1976. "Adam Smith on population growth and economic development." *Population and Development Review* 2(2): 167-180.
- Ström, S. 2009. "Housing and first births in Sweden, 1971-2002." Stockholm University, *Stockholm Research Reports in Demography* 2009:2.
- Stuckler, D., S. Basu, M. Suhrcke, A. Coutts, and M. McKee. 2009. "The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis." *Lancet* 374 (Issue 9686): 315-323.
- Teitelbaum, M.S. 1984. *The British fertility decline: demographic transition in the crucible of the industrial revolution*. Princeton, N.J: Princeton University Press.
- Tzanos, Z. and J. Simons. 1989. "An economic approach to fertility in Britain since 1860." *Journal of Population Economics* 2: 121-138.
- Ueno, C. 1998. "The declining birth rate: Whose problem?" *Review of Population and Social Policy* (7):103-128.
- UNECE. 2000. "Fertility decline in the transition economies, 1989-1998: Economic and social factors revisited". In: *Economic Survey of Europe 2000, No. 1*. Economic Commission for Europe, United Nations, New York and Geneva, pp. 189-205.
- UNECE. 1999. "Fertility decline in the transition economies, 1982-1997: Political, economic and social factors". In: *Economic Survey of Europe 1999, No.1*. Economic Commission for Europe, United Nations, New York and Geneva, pp.181-195.

- UNESCO. 2009. *Education for All. Global Monitoring Report*. UNESCO Institute for Statistics: New York.
- UN. 2004. *World Fertility Report 2003*. United Nations: New York.
- Van Bavel, J. 2007. "Subreplacement fertility in the West before the baby boom (1900-1940). Current and contemporary perspectives." Paper presented at the 32nd Annual Meeting of the Social Science History Association, Chicago IL, November 18, 2007.
- Van Bavel, J. 2001. "Malthusian sinners: illegitimate fertility and economic crisis. A case study in Leuven, 1846-1856." *Tijdschrift voor Nieuwste Geschiedenis/Revue Belge d'Histoire Contemporaine*, 31(3-4): 371-401.
- Van de Kaa, D. J. 2001. "Postmodern fertility preferences: From changing value orientation to new behavior". In: R. A. Bulatao, J. B. Casterline (eds.) *Global fertility transition*. Supplement to *Population and Development Review* 27, New York, Population Council, pp. 290-338.
- Van Giersbergen, N.P.A. and J. De Beer. 1997. "Geboorteontwikkeling en consumentenvertrouwen: een econometrische analyse." [Birth trends and consumer confidence: An econometric analysis]. *Maandstatistiek van de bevolking* 1997(11): 23-27.
- Verick, S. 2009. "Who is hardest hit during a financial crisis? The vulnerability of young men and women to unemployment in an economic downturn." *IZA Discussion Paper*, no. 4359, Institute for the Study of Labor, Bonn.
- Vikat, A. 2002. "Fertility in Finland in the 1980s and 1990s: Analysis of fertility trends by age and parity". *Yearbook of Population Research in Finland* 38 (2002): 159-178.
- Vikat, A. 2004. "Women's labor force attachment and childbearing in Finland." *Demographic Research*, Special Collection 3 (Article 8): 177-212.
- Vogel, J. and G. Råbäck. 2004. "Materiell ojämlikhet i tids- och internationellt perspektiv." [Material inequality over time and across countries]. Chapter 4 in *Levnadsförhållanden Report* 100. Stockholm: Statistics Sweden.
- Wachter, M.L. 1975. "A time-series fertility equation: The potential for a baby-boom in the 1980's." *International Economic Review* 16(3): 609-624.
- Willekens, F. and G. Beets. 2009. "The global financial crisis and international migration: An uncertain outlook" Forthcoming in the *Vienna Yearbook of Population Research* 2009.
- Yule, G.U. 1906. "On the changes in the marriage- and birth-rates in England and Wales during the past half century; with an inquiry as to their probable causes." *Journal of the Royal Statistical Society* 69(1): 88-147.
- Zakharov, S. V. 2000. "Fertility trends in Russia and the European newly independent states: Crisis or turning point?" *Population Bulletin of the United Nations*, Special Issue 40/41, 1999: 292-317.

## **APPENDIX:**

### **Additional illustrations on the association between GDP change and the period TFR**

In addition to simple descriptive analysis presented in Table 1 we have carried out more detailed investigation of the association between annual changes in the Gross Domestic Product (GDP) and the subsequent changes in the period Total Fertility Rates (TFR). We see this as a preliminary and largely illustrative work that needs further elaboration and suffers a number of potential biases: First, the period TFR is a problematic indicator of period fertility that is strongly affected by the changes in the timing of childbearing (Bongaarts and Feeney 1988, Sobotka and Lutz 2009). Therefore, our analysis cannot distinguish whether a GDP decline leads, for instance, to a decline in the ‘underlying’ fertility level, or merely to the postponement of childbearing as both of these effects are manifested by a fall in the period TFR. Second, as discussed in our review, other factors than the GDP change are more likely to be the driving forces behind changing fertility trends in times of economic recession. Therefore, analysing the effects of changing unemployment and employment uncertainty (as expressed by temporary job, long-term unemployment, or part-time jobs) or controlling for them in our analysis would give more credible results. Third, to capture better the TFR changes following the onset of the GDP decline or stagnation, it would be preferable to use monthly series of both indicators (which are, however, not readily available), as annual time series are rather ‘crude’ and do not allow finer specification of time lags. Fourth, since the effects of recession on childbearing behaviour are differentiated by sex, age, partnership status, socio-economic position, parity and differ by institutional context, our analysis of associations for individual countries and for the pooled data set for all countries disregards all these important factors. Eventually, the best model would combine individual and aggregate data and control for both individual characteristics and regional or country-level changes in unemployment, economic growth and other important contextual factors.

Nevertheless, we find our analysis useful as a background to our review that is mainly focused on an aggregate-level effect of economic recessions on fertility. Our illustrations can provide a rough assessment of the magnitude to which the TFR trends ‘react’ to the GDP swings during the recessions and point out considerable chronological and cross-country diversity in these associations. We use one and two-year time gaps between the GDP change and the TFR change in order to accommodate duration of pregnancy and some time needed for the couples to react to changed economic conditions and to alter their childbearing intentions and reproductive behaviour. We plan to work on a more sophisticated analysis in the future.

We use data for 26 OECD countries (all the OECD member countries except Iceland, Luxembourg, Mexico, and Turkey) for the period 1971-2008. For a few countries the time series of annual GDP data provided by OECD (2009) extend back to 1956 (France and Sweden) or start in the 1960s (Denmark, Greece), whereas for the post-communist Central European countries (Czech Republic, Hungary, Poland, Slovakia) the time series begin only in 1991-93.

Table A1 presents correlation coefficients between the GDP change and the period TFR for all the cases when the GDP increased by less than 1% or declined, also including the pre-1980 period (all the countries and years of observation are pooled together). At first glance, using a time lag of two years does not yield any noticeable association between the two time series. Using a one-year time lag gives a weak correlation coefficient of 0.25, which does not

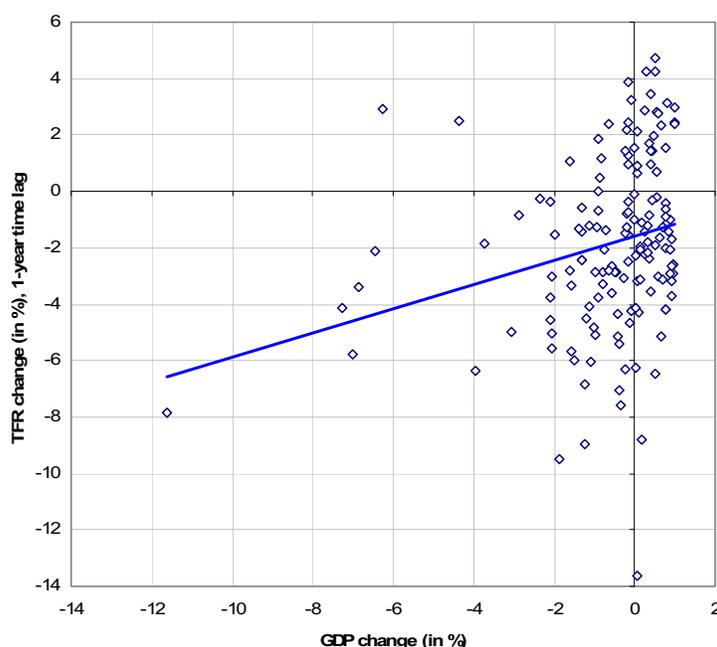
increase further when only data for the more recent period starting in 1980 are included or when only the periods of the GDP decline are analysed. However, excluding the most notable outlier in the data, Finland, increases the correlation coefficient to 0.38. Figure A1 provides graphical illustration of this correlation, showing also several cases of particularly strong GDP decline.

**Table A1:** Correlation between GDP change and period TFR in the years when the GDP increased by less than 1%, 26 low-fertility countries, 1971-2008

|  | Correlation coefficient      |               |                |
|--|------------------------------|---------------|----------------|
|  | Cases<br>(country<br>-years) | 1-year<br>lag | 2-years<br>lag |
| <b>All cases, period 1956-2008</b>                           | 150                          | 0.25          | 0.05           |
| Period 1980-2008 only  | 120                          | 0.27          | 0.10           |
| Only recessions (GDP growth<0%), 1980-2007                   | 62                           | 0.26          | -0.02          |
| Only recessions (GDP growth<0%), 1980-2007 excluding Finland | 59                           | 0.38          | 0.01           |

SOURCES: See Table 1

**Figure A1:** GDP change and change in the period TFR in the subsequent year; years when the GDP increased by less than 1%, 26 low-fertility countries, 1971-2008



SOURCES: See Table 1

The overall rather correlation between trends in GDP and the period TFR during the times of economic slowdown might be a result of cross-country differences in the strength of this association and in ‘reaction times’ between the changes in the GDP and the TFR. Table A2 explores country-specific correlations, including all the periods for which the data are available (thus, also the periods of robust GDP growth) in order to get a meaningful number of observations for each country. We look at both one-year and two-year lags and show only the coefficients that were above 0.4 in absolute terms. Overall, the country-specific patterns

are mixed as countries differ vastly in their GDP-TFR relationship as well as in their time lags with a stronger association. Before 1980, during the period of generally declining fertility, six out of ten countries that reached a correlation of 0.4 or stronger actually displayed a counter-cyclical pattern, with a GDP growth frequently associated with a subsequent TFR decline. This pattern is in agreement with Butz and Ward's (1979a) hypothesis that rising female employment will lead to a counter-cyclical fertility pattern. However, the GDP-TFR link becomes less ambiguous after 1980, when 11 out of 26 countries show a positive (pro-cyclical) association between economic growth and period fertility, while the other 15 countries do not show any stronger association between the two variables. In contrast to the pooled data in Table A1, six countries show a closer link between the GDP and the TFR when using a longer time lag of two years.

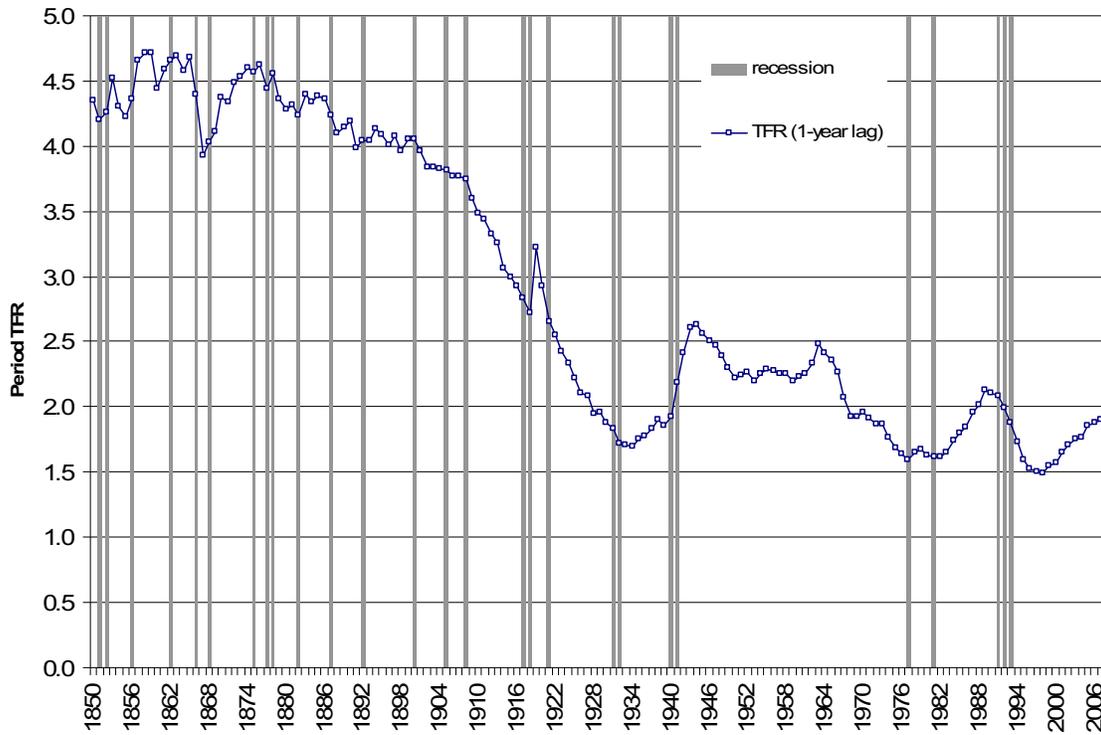
**Table A2:** Correlation between GDP change and period TFR in 26 low-fertility countries, 1956-2008

|                 | Period: Before 1980 |          |       | Period: 1980-2008 |       |                |
|-----------------|---------------------|----------|-------|-------------------|-------|----------------|
|                 | Period              | Time lag | Coeff | Time lag          | Coeff | Note:          |
| Australia       | 1971-79             | ..       | ..    | ..                | ..    |                |
| Austria         | 1971-79             | ..       | ..    | 2                 | 0.50  |                |
| Belgium         | 1971-79             | 1        | -0.64 | 1                 | 0.46  |                |
| Canada          | 1971-79             | 1        | -0.42 | ..                | ..    |                |
| Czech Republic  | xx                  |          |       | 1                 | 0.51  | 1991-2008 only |
| Denmark         | 1968-79             | 2        | 0.66  | ..                | ..    |                |
| Finland         | 1971-79             | 2        | 0.76  | ..                | ..    |                |
| France          | 1956-79             | ..       | ..    | ..                | ..    |                |
| Germany         | 1971-79             | ..       | ..    | ..                | ..    |                |
| Greece          | 1961-79             | ..       | ..    | 2                 | 0.69  |                |
| Hungary         | xx                  |          |       | 2                 | 0.51  | 1992-2008 only |
| Ireland         | 1971-79             | ..       | ..    | 1                 | 0.63  |                |
| Italy           | 1971-79             | ..       | ..    | ..                | ..    |                |
| Japan           | 1971-79             | 1        | 0.62  | ..                | ..    |                |
| Korea           | 1974-79             | ..       | ..    | ..                | ..    |                |
| Netherlands     | 1971-79             | 1        | -0.48 | 1                 | 0.59  |                |
| New Zealand     | 1971-79             | 2        | -0.79 | ..                | ..    |                |
| Norway          | 1971-79             | 1        | -0.47 | ..                | ..    |                |
| Poland          | xx                  |          |       | ..                | ..    | 1991-2008 only |
| Portugal        | 1971-79             | 1        | -0.58 | ..                | ..    |                |
| Slovak Republic | xx                  |          |       | 2                 | 0.57  | 1993-2008 only |
| Spain           | 1971-79             | 2        | 0.79  | 2                 | 0.52  |                |
| Sweden          | 1956-79             | ..       | ..    | 2                 | 0.49  |                |
| Switzerland     | 1971-79             | ..       | ..    | ..                | ..    |                |
| United Kingdom  | 1971-79             | ..       | ..    | ..                | ..    |                |
| United States   | 1971-79             | ..       | ..    | 1                 | 0.47  |                |

SOURCES: See Table 1

Finally, to provide an illustration of the GDP-TFR association in a long-term perspective, we use historical annual time series for Sweden in the period 1850-2008 (Figure 2). Clearly, in most periods including the Depression of the 1930s, the onset of the economic recession did not alter the ongoing trends in the TFR, although it could have accelerated or prolonged the ongoing decline. Only the recessions of the early 1990s as well as two recessions in the second half of the 19th century (1866 and 1868 and 1877-78) seem to have had some impact on the TFR trend. In contrast, some recessions were linked to rising fertility, most notably the economic recession after the start of the World War II, in 1940-41.

**Figure A2:** Economic recessions and period TFR in Sweden, 1850-2008 (1-year time lag). Years with negative GDP growth are marked by grey lines



SOURCES: GDP change: For 1850-1955 data provided in the online database of Swedish historical statistics (Historical Statistics 2009); for 1956-2007: authors' computations based on OECD (2009). TFR: Festy (1979) for 1850-1959; Eurostat (2009) and author's computations based on Eurostat (2008) for 1960-2008.