

# ECONOMIC RECESSION AND FERTILITY IN THE DEVELOPED WORLD

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## ABSTRACT

This paper examines the effects of past economic recessions on fertility in the developed world. First we study how fertility levels and trends are affected by aggregate-level indicators of the recession, such as declining GDP levels, falling consumer confidence and rising unemployment. Subsequently, we discuss particular mechanisms and pathways through which the recession affects fertility behavior at the individual level, including the effects of economic uncertainty, changes on the housing market and rising enrolment in higher education. Most studies find that fertility tends to be pro-cyclical and often rises and declines with the ups and downs of the business cycle. Usually, these aggregate effects are relatively small (typically, several percentage points) and of relatively short durations; in addition they often seem to influence especially the timing of childbearing rather than the level (quantum) of fertility. Therefore, the recession-induced fertility changes can often be ‘overrun’ by major long-term fertility shifts that continue seemingly uninterrupted during the recession—such as the fertility declines before and during the ‘Great Depression’ of the 1930s and before and during the oil shock crises of the 1970s. The tendency of recessions to have overall small negative impact is partly explained by differential fertility responses by social groups, family status, age, and parity. Furthermore, various policies and institutions modify or even reverse the relationship between recessions and fertility.

## INTRODUCTION

Research on economic recessions in the past shows they can affect the dynamics of family formation, fertility, mortality, and migration.<sup>1</sup> Since the start of the recent economic crisis—the most severe global recession after the World War II—media have frequently suggested that the recession will result in a baby bust. For instance, an article by Jessica Guynn published in Los Angeles Times on December 10, 2008 states: “Birthrates typically decline during economic downturns. Would-be parents struggle with the wisdom of waiting.”<sup>2</sup> Germany’s leading weekly magazine, *Der Spiegel*, brought an article titled “Crisis babies” which warns that employment instability will lead to a fear of the future and the decline in birth rates.<sup>3</sup> In Australia, the minister of employment and workplace relations aptly proposed in 2002 that “Children are the ultimate vote of confidence in the future” (cited in Martin 2004:

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<sup>1</sup> For an aggregate effect of the recession on public health and mortality, see recent studies of Stuckler et al. (2009), Fallagas et al. (2009) and Simms (2009). For a review of the effects of economic recession on migration, see Beets and Willekens (2009).

<sup>2</sup> This article quotes Dr. Khalil Tabsh, chief of obstetrics at the University of California, who expects to start seeing a drop in pregnancies: “If you can’t pay your mortgage, the last thing on your mind is to have another child”. Other illustrative examples of articles linking recession with an expected decline in birth rates include a Newsweek article by Daniel Gross (“The baby bust”, May 30 2008, <http://www.newsweek.com/id/139267>) or an MSNBC feature by Melissa Schorr from January 14, 2009, titled “Shaky economy means ‘bye-bye baby’ for some” (<http://www.msnbc.msn.com/id/28624299/>).

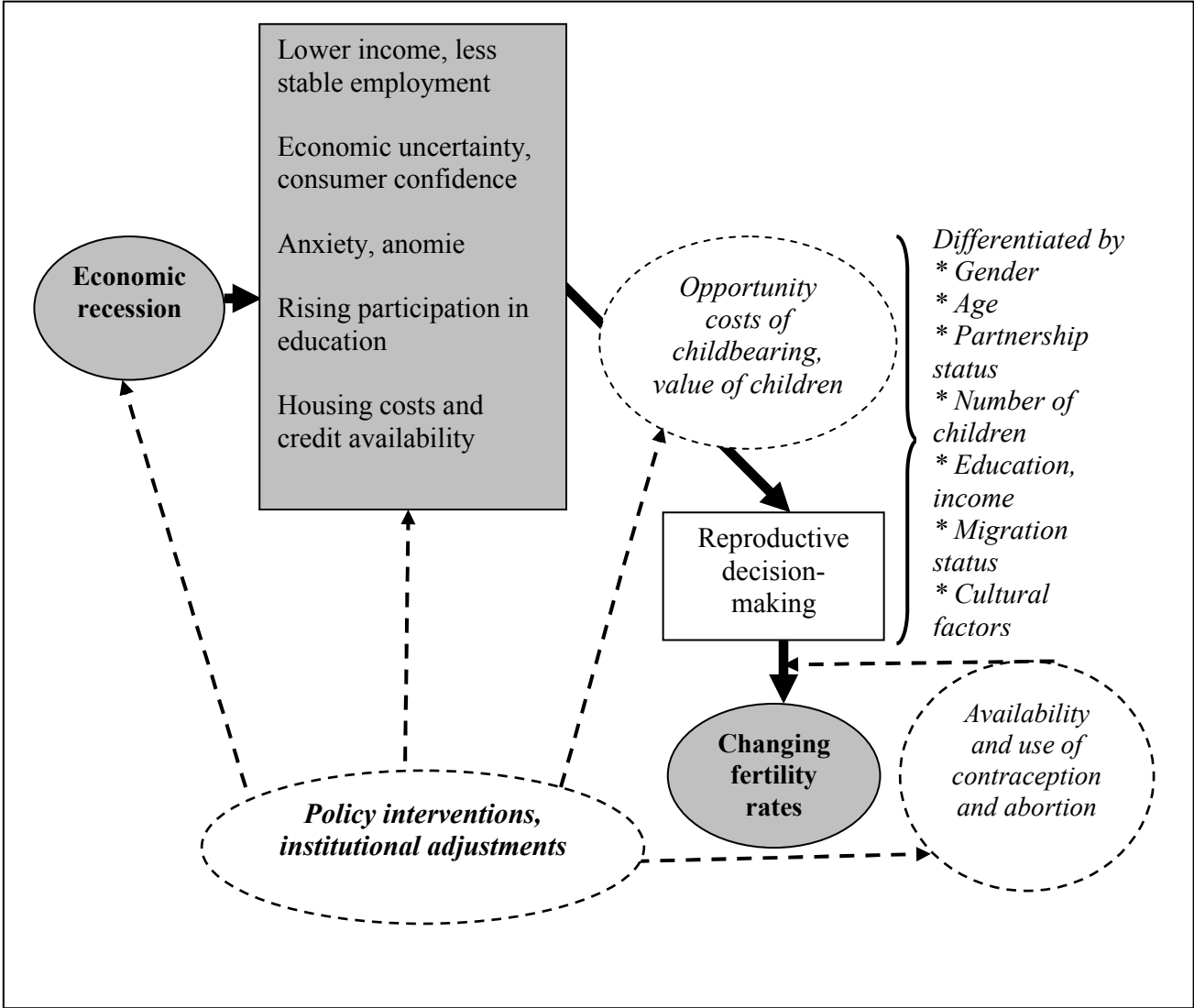
<sup>3</sup> Kerstin Kullman and Bettina Malter, *Der Spiegel* 23/2009, 30 May 2009, p. 49; <http://wissen.spiegel.de/wissen/dokument/dokument.html?id=65556298&top=SPIEGEL>

31). 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 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 developed countries with low fertility. First we 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: the ‘Great Depression’ of the 1930s, the oil shocks of the 1970s, and the economic crisis following the collapse of state-socialist system in Central and Eastern Europe in 1989-1990. Subsequently, we review particular mechanisms how the recession influences fertility behavior of women and men, discussing the effects of rising unemployment and falling employment stability, rising uncertainty, changing housing market, and rising participation in education. Most of this research is anchored at an individual level and contributes greatly to our understanding of diverse channels through which the recession affects behavior (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 sex, 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 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). Therefore, much of this contribution deals with ‘smaller waves’ rather than ‘large tides’ – we discuss relatively short-term swings in fertility rates in the developed world and do 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).

**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.

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 the Russian Federation, the Scandinavian crisis of the early 1990s or the 1994 Mexico crisis, the current recession is global, affecting virtually all markets around the world. The cultural and institutional context in the developed worlds is substantially different than at the time of the past crises: More women than ever are participating (and competing with men) on the labor 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 has 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 labor market and the

younger ones have to compete for fewer jobs and accept lower wages. All these factors can affect reproductive decisions, potentially reinforcing 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 impact of economic swings may differ.

## **ECONOMIC RECESSIONS AND FERTILITY TRENDS**

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>4</sup> The negative relationship between economic crisis and fertility as well as marriages 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.

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<sup>4</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.

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.

### **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.<sup>5</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.

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<sup>5</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).

**Table 1:** Association between 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)

| GDP change                                   | Total cases (country-years) | Cases with TFR decline | Cases with TFR increase | Percent with TFR decline | Odds ratio TFR decline |
|--|-----------------------------|------------------------|-------------------------|--------------------------|------------------------|
| 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 stroke.

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 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>6</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

<sup>6</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.

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>7</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.

### **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 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

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<sup>7</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).

(Adsera 2004).<sup>8</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) suggested 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.

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>9</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 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

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<sup>8</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>9</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.



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).

### **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 Buitenheim 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).

### **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).

### **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).

### **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.

## **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.

### **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, Liebroer 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>10</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).

### **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 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).

### **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,

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<sup>10</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).

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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **CONCLUSIONS**

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 caused by other factors than economic recession. This explains 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 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. 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, who are hardest hit by the recession. 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 will face more difficulties finding a partner to start a family. Overall, many couples will receive lower wages and have fewer employment opportunities. Their tighter budget would reduce the 'affordability' of children. If this 'income effect' dominates the changing opportunity costs, the net impact of the crisis would be a reduction in fertility—as it is observed in most aggregate-level analyses.

The relationship between economic recession and fertility is contingent upon social and institutional arrangements. Governments moderate the adverse effects of the crisis on fertility through employment and family policies. 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 (Matysiak and Vignoli 2008). 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' behavior and therefore cutbacks in family-related spending may be considered as "signals about the hard times to come (...) creating a pessimistic climate of opinion conducive to postponement of childbearing" (Hoem 2000). At the same time, well-intended policies could become 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 labor market, and of those in part-time and precarious jobs and, in affect, hamper fertility (Adsera 2005b).

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 would 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). 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 behavior.

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## 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, including the sensitivity of the period TFR to the changes in the timing of childbearing (Bongaarts and Feeney 1988, Sobotka and Lutz 2009). Since the effects of the 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 should not be interpreted in causal terms and should be seen as a rough assessment of the magnitude to which the TFR trends ‘react’ to the GDP swings during the recessions.

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. 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 alter their childbearing intentions and reproductive behavior.

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 analyzed. However, excluding the most notable outlier in the data, Finland, increases the correlation coefficient to 0.38.

**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

NOTE: It can be argued that the four Central European OECD members (Czech Republic, Hungary, Poland, Slovakia) should be excluded from the analysis since the economic crisis in the 1990s in this region was linked to the huge societal and economic transformation after the collapse of state socialism. However, their exclusion does not bring any perceptible change in the results.

The overall weak correlation between changes in the 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’ in the TFR trends. 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