Economic Recession and Fertility in the Developed World

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RESEARCH ON economic recessions in the past shows they can affect the dynamics of family formation, fertility, divorce, mortality, and migration.[1] During the recent economic downturn—the most severe global recession after World War II—media reports have frequently suggested that the recession will result in a baby bust. For instance, an article in the *Los Angeles Times* in December 2008 stated: "Birthrates typically decline during economic downturns. Would-be parents struggle with the wisdom of waiting."[2] Germany's leading weekly magazine, *Der Spiegel*, published an article titled "Crisis babies," which warned that employment instability will lead to a fear of the future and a decline in birth rates.[3] 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: 31). Thus, a link between the downturn in the business cycle and declining birth rates is frequently assumed by the media, politicians, and the lay public. Little systematic research has been done on this issue, however. Our article aims to address this shortcoming.

Our review discusses research findings on how recessions affect fertility as well as family formation and dissolution insofar as they influence fertility trends. In addition, we provide simple empirical illustrations of the association between economic downturns and period fertility in developed countries with low fertility. A wealth of research at the individual level contributes to our understanding of diverse channels through which recession affects behavior. However, this evidence cannot be readily 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 stage in the life cycle), ethnicity, socioeconomic status, and current family size (e.g., De Cooman, Ermish, and Joshi 1987, Kreyenfeld 2010, Adsera 2010).

These differentiated fertility responses partly result from considerable variability in the opportunity costs of childbearing during economic downturns.

Public policies may influence fertility during a recession in varied ways. They may alter the course of economic recession itself (e.g., by boosting or restricting government spending), may target particular symptoms and consequences of the recession (e.g., educational enrollment, the housing market, or unemployment trends), or may directly affect opportunity costs of childbearing by changing monetary support to families, the childcare system, or parental leave provision. Because most economic recessions in the past were of relatively short duration, their impact on fertility rates was temporary (Lee 1990).[4] Therefore, much of our overview deals with short-term swings in fertility rates in the developed world and ignores major long-term alterations in fertility patterns that are typically caused by other factors.

We proceed as follows. After highlighting important methodological issues, we review research results concerning the association between economic downturns—as measured by GDP decline, falling consumer confidence, and rising unemployment—and fertility trends. We also examine findings on the association between economic recession and partnership formation, marriage, and divorce, all of which indirectly influence fertility changes. We then turn to three major economic recessions in the twentieth century: the Great Depression of the 1930s, the oil shocks of the 1970s, and the economic shocks in Central and Eastern Europe during the 1990s. We explore selected factors and mechanisms through which economic recession was found to affect fertility and show that fertility responses to economic crisis vary by sex, labor market, number of children, and social status. We also analyze preliminary evidence on the fertility impact of the recent (2008–2009) economic recession. Finally, we summarize major research findings.

Methodological considerations

Because our focus is on the most developed countries (including Eastern and Southeastern Europe), which were hardest hit by the recession,[5] we pay little attention to the evidence for less developed areas, where the effects of the recession may differ. The widely used terms economic recession, economic crisis, and financial crisis are frequently employed interchangeably and rather loosely. We employ the term *economic recession* to refer to a period of decline in economic activity that lasts longer than a few months (Claessens and Kosse 2009).[6] Symptoms of economic recession typically include rising unemployment and involuntary part-time work as well as heightened employment uncertainty, falling consumer confidence and housing prices, and frequently also declining or stagnating wages, lower inflation, tighter credit availability, depreciation of assets accumulated in stocks, pension funds, and property, and increased perception of distress. We consider a variety of indicators,

including the effects of unemployment and economic uncertainty that were not necessarily experienced during periods of recession. This approach allows us to elucidate evidence from numerous studies whose main focus is often unrelated to recession.

Our review is based on a wide range of research, which implies a diversity in methods, data, terminology, and models used. Recession is measured by various indicators, and fertility rates are assessed using such measures as the period total fertility rate, completed fertility, and age-specific and order-specific data. We do not aim to identify the precise relationship between a particular measure of recession and a specific indicator of fertility. Rather, we sketch a general picture of how the recession, broadly defined, affects fertility. We split the analysis into two main parts, one referring to the aggregate population-wide effects of recession on fertility rates, and the other focused on individual-level findings and mechanisms of the influences of recession on fertility behavior.

An economic recession may affect fertility because for many individuals it implies a bad economic situation, lower income, increased job demands, and related symptoms; because it leads to a sudden and unexpected deterioration of economic conditions relative to aspirations and expectations; or because it entails widespread uncertainty without actually affecting the lives of many people (Tausig and Fenwick 1999).[7] Although much of the literature takes a static approach, looking at the effects of a "bad situation" rather than of the relative impact of "worsening conditions," we believe that an unexpected deterioration in economic conditions is of higher importance, in line with the arguments about the role of relative expectations (Easterlin 1980). Taking unemployment as an example, we are less interested in whether high unemployment depresses fertility than in whether and how a sudden increase in unemployment, usually linked to the deterioration in economic circumstances, affects fertility. Many countries may experience high structural unemployment, which is taken into account by individuals in shaping their plans and expectations for the future. However, a rise in unemployment, even from a comparatively low level, signals that the economic conditions are worsening. While we do not restrict our study to this type of evidence, our preferred "model specification" studies to what extent a change in unemployment level stimulates a change in fertility level. Another potentially valid specification may ask whether a rise in unemployment leads to a long-lasting change in fertility, persisting for some time even when the rate of unemployment eventually declines. Such a specification implies different underlying mechanisms and may lead to predictions different from those of the previously mentioned specifications. However, this type of research is rare.

Some terms commonly used in the literature may have ambiguous meaning. For instance, *fertility postponement* is often not clearly defined and understood (Ní Bhrolcháin and Toulemon 2005), and few studies differenti-

ate between temporary fertility decline that may later be "recuperated" and a permanent (quantum) fall in fertility (among the exceptions, see Neels 2010 for a cohort perspective and Örsal and Goldstein 2010 for a period view). In an aggregate perspective, postponement is frequently conceptualized as a decline in fertility rates, concentrated at younger ages, which is later followed by a "compensatory" fertility increase at older ages (*recuperation*), and does not result in a corresponding fall in completed cohort fertility.[8] In practice, it is difficult to distinguish between "true" period fertility decline (quantum effect) and "apparent" fertility decline driven by the shift in the timing of births (tempo effect). Thus, the interpretations related to the timing and quantum effects on fertility of the factors associated with recession may to some extent be subjective. However, short-term fertility changes, with the exception of severe crises such as the Great Depression of the 1930s, are unlikely to have a measurable impact on the number of children women and men will have at the end of their reproductive lives.

Economic recession and fertility trends

Research on the effect of economic recession on fertility usually supports the idea that fertility responds negatively to downturns in the business cycle. In other words, most studies find a pro-cyclical relationship between economic growth and fertility in the developed world. Recessions often lead to a postponement of childbearing, especially of first births, which can later be largely compensated during times of economic prosperity (Neels 2010). Rindfuss, Morgan, and Swicegood (1988: 87) pointed out that "fertility delay in the West is a time-honored, normatively approved response to harsh economic conditions." Typically, fertility decline during a recession is temporary, usually followed by a compensatory rise in fertility (or at least a slowing in its pace of decline). These downward shifts in fertility start with a short time lag of one to two and a half years.[9] The negative relationship between economic crisis and both marriage and birth rates has also been noted in historical studies related to the nineteenth and the first half of the twentieth century (e.g., Lee 1990, Van Bavel 2001 for Belgium; Yule 1906, Teitelbaum 1984, and Tzanatos and Simons 1989 for Great Britain; Bengtsson, Campbell, and Lee 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, Stokes, and Cornwell 2000 for Cameroon).

From a theoretical perspective, the idea that fertility responds positively to economic prosperity and negatively in times of crisis has been pursued for centuries. For instance, Adam Smith linked the rate of economic development and growth to "multiplication of the species" (Spengler 1976: 173). Becker (1960: 231) compared children to durable goods, demands for which would increase with a rise in couples' income and with a decline in their "price."

Easterlin (1973, 1976) made an important modification of these classical economic arguments, emphasizing the role of income relative to couples' economic aspirations. In his view, fertility varies with the relative affluence of the younger cohort, which is gauged against their childhood experiences within their parents' household. In contrast, Butz and Ward (1979a and 1979b) suggested that with rising employment of women, fertility trends are likely to become counter-cyclical. For women, children would be most expensive to raise during times of economic prosperity, and such periods would therefore be associated with low fertility rates. Although Butz and Ward's hypothesis found support in their analysis of US data pertaining to the first half of the 1970s, later research by Macunovich (1996) indicated that American 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 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 a recession as outcomes of frequently countervailing forces where some individuals find it advantageous to have a child during economically uncertain times, whereas others will decide to postpone the next birth or refrain 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 trends

Many studies draw a link between economic recession and fertility decline when interpreting fertility trends (e.g., Ogawa 2003 for Japan; Rindfuss, Morgan, and Swicegood 1988 for the United States), but few provide a formal analysis using aggregate indicators of economic performance such as the gross domestic product (GDP). GDP decline often correlates with a subsequent fall in the fertility rate.[10] A simple descriptive analysis in Table 1 confirms that this was a dominant occurrence across most of the rich low-fertility countries during the last three decades. While, on average, the period TFR declined slightly more often than it increased in 26 OECD 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 the likelihood was also elevated in the years with a mere stagnation in the GDP (i.e., GDP growth of less than 1 percent), when the TFR declined in two-thirds of the 60 observations. In contrast, in the years with GDP growth of 1 percent or more, there were almost as many observations of a rise in TFR as a decline. We provide additional analysis of this association in the Appendix.

TABLE 1 Association between GDP change and change in the period total fertility rate (TFR) in 26 low-fertility countries, 1980–2008 (using one-year time lag between change in GDP and change in TFR)

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

NOTE: The most recent GDP data pertain to 2007 and the most recent TFR data to 2008. Included are all OECD countries as of 2009 except Iceland, Luxembourg, Mexico, and Turkey (see also Appendix). The GDP time series for the Central European countries (Czech Republic, Hungary, Poland, Slovakia) begin in 1991–93. Excluding these countries does not alter our results.
DATA 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.

This correlation often dissipates in a multivariate model. This does not mean that economic downturns have no influence on fertility, but rather that indicators other than the GDP may more readily identify the pathways through which economic recession affects fertility trends. For instance, a study of Australian fertility over 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 recession (as measured by GDP decline) on first-birth rates, controlling for unemployment and a number of social, economic, and family-related characteristics of the women studied. Compared to non-recession periods, conception rates leading to first births were reduced by 21 percent in years of economic recession.

In post-Communist countries of Central and Eastern Europe, Billingsley (2010) 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; a similar result was obtained in a more extensive model of first births in Hungary (Aassve, Billari, and Spéder 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) showed that GDP is positively linked to fertility in a macro-level analysis, and that 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 rates, even when controlling for unemployment. Using a longer time series of data on changes in GDP, births, and marriages over 1908–1990 Palloni, Hill, and Aguirre (1996) found a procyclical association between GDP change and marital births with a one-year gap in only five out of 11 Latin American countries analyzed, suggesting that the response of fertility to economic shocks was minor in most cases.[11]

Arguably, the perception of crisis can be better reflected by the indicators of consumer confidence, which have been employed in explanatory models of short-term fluctuations in the TFR in the Netherlands since the early 1980s (de Beer 1991, de Jong 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 (around 1.5 percent of total births; the time lag between the two time series is 2.25 years).[12] More recently, Fokkema et al. (2008: 774–776) applied a regression model with a two-year 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 half is attributable to first births and half to second births.[13] 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 associated with fertility decline

Compared with GDP change, rising unemployment is a more tangible indicator of the impact of economic crisis and one that 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 and partnership formation on the other has been repeatedly identified across developed countries. The effect of male unemployment appears to be particularly important, arguably in line with the continuing salience of male income for family formation. High and persistent unemployment among young adults, coupled with unstable jobs and high levels of employment uncertainty, has become one of the most prominent explanations of low and delayed partnership and family formation in Southern Europe, especially in Spain (Ahn and Mira 2002, Baizán, Michielin, and Billari 2002, Simó Noguera, Golsch, and Steinhage 2002, Simó Noguera, Martin, and Bonmati 2005, Adsera 2004 and 2010, d'Addio and d'Ercole 2005, Billari and Kohler 2004). In a cross-country comparison, unemployment rates have been nega-

tively correlated with period total fertility rates in Europe since the mid-1990s (d'Addio and d'Ercole 2005: Figure 17). This relationship has also been found in micro-level studies that use selected aggregate-level indicators of period or regional conditions.

Many studies attempt to distinguish between the effects of male and female unemployment. Örsal and Goldstein 2010, studying 22 OECD countries, demonstrated a negative effect of an increase in both male and female unemployment on period total fertility rates in 1976–2008. This pro-cyclical effect has grown over time, especially for women. Looking at unemployment levels rather than trends, Adsera (2010) found that across Europe high female unemployment has led to first-birth postponement since the 1980s (but not in the 1970s and the early 1980s), and some effect of unemployment was also found for second and third births. High unemployment has a particularly depressing effect on fertility when it is combined with a high share of self-employment (Adsera 2004).[14] This relationship suggests a positive influence of more stable public-sector jobs among women, for whom work stability (and guaranteed return to employment) supports higher fertility. In most countries, public-sector jobs are also less likely to be affected by 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: a one-percentage-point increase in regional unemployment increased the likelihood of having a first birth by 3 percent (Schmitt 2008: 42).

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 agrees with the analysis by Rindfuss, Morgan, and Swicegood (1988) of long-term trends in first births from 1917 to 1980, 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 US women, whereas Mocan's (1990) econometric analysis of American fertility trends identified 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 rates of first and second births among women below age 30 (de Cooman, Ermish, and Joshi 1987). Neels (2010), looking at the effects of aggregate unemployment on fertility in Belgium, France, and the Netherlands, concluded that high unemployment rates exerted negative pressure on first-birth rates one year later, especially among women below age 30.[15]

Fertility in East Asia is also negatively affected by unemployment. An analysis of municipal data for Japan suggested that rising unemployment

among young men contributed significantly to the TFR decline in 2000–04 (Ogura and Kadoda 2008). In Taiwan, monthly time series of birth rates were negatively affected by periods of rising unemployment between 1978 and 2000 (Huang 2003).

Extensive research on the effects of unemployment on birth rates in the Nordic countries shows that aggregate unemployment trends, especially at younger ages, affect fertility as much as individual experience of unemployment. Kravdal (2002) analyzed jointly the effects of individual and aggregate unemployment on first and higher-order births in Norway. Using simulations, he found that rising unemployment led to a reduction in the period TFR of 0.08 during the recession around 1993. This decline was dominated by the aggregate effect rather than by individual experiences of unemployment.[16] Pronounced swings in fertility rates in Sweden have been associated with fluctuations in the business cycle, supporting a notion of pro-cyclical fertility (Andersson 2000) or, as Hoem and Hoem (1996) termed it, roller-coaster fertility. 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 status (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 to the usual association between recession and fertility: whereas first births declined from 1992 onward, there was a continuing upward trend in second and higher-order births throughout the recession (Vikat 2002, 2004). This finding suggests the importance of welfare and family policies for moderating or even reversing the impact of recession on fertility (see concluding section).

Effect of recession on partnership formation, marriage, and divorce

Rising unemployment stimulates delays and declines in marriage and partnership formation, which often indirectly contribute to the decline in first-birth rates. However, the direction of causality in the marriage/fertility relationship is ambiguous, as lower marriage rates during economic downturns may arise because couples do not yet want to have a child and therefore also see little need to marry. Prioux (2003: Figure 4) has presented a clear-cut example of an inverse relationship between the youth unemployment rate (at ages 20–24) and the rate of first-union formation in France, indicating that difficulties in the labor market lead couples to defer both marriage and entry into cohabitation.

Delayed marriage has the 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 during times of economic uncertainty (e.g., Ahn and Mira 2001, Castro Martín 1992).

Outside Europe, countries in East and South-East Asia have experienced a marked postponement and decline in marriages, which account for a large portion of their fertility decline in recent decades (Chang 2006, Matsukura, Retherford, and Ogawa 2007, Jones 2007). These trends have been most thoroughly analyzed in Japan (e.g., Ogawa and Retherford 1993, Ueno 1998, Retherford, Ogawa, and Matsukura 2001, Takahashi 2004, Matsukura, Retherford, and Ogawa 2007), where the assumptions about cohort trends in first-marriage rates remain an important component of fertility projections (Kaneko et al. 2008). Retherford, Ogawa, and Matsukura (2001) described a link between economic recession and postponement of marriages in Japan, suggesting that recession retards income growth and makes marriage unaffordable for many young people. In South Korea, Eun (2003) argued that the 1997 economic crisis, which brought higher unemployment, sharply rising job instability, and the rise of temporary jobs among the young, has affected trends in marriage, fertility, and divorce and that marriage postponement was the most significant proximate determinant of declining fertility. At least two Asian countries appear to show an opposite pattern, however. In Indonesia, the severe economic crisis of 1997–98 disrupted a long-term trend toward later marriage, increasing the likelihood among younger men and women of marrying in 1998–99 (Nobles and Buttenheim 2006). In Taiwan, Huang's (2003) modeling of monthly data suggested that marriage rates were positively affected by unemployment. Finally, in the United States, annual unemployment trends had a negative effect on women's entry into marriage as a first union when individual characteristics were controlled, while they had no effect on the entry into cohabitation (Berkowitz King 2005).

It is less clear how recession affects divorce and union dissolution. Roughly speaking, two contrasting effects operate in tandem (Fischer and Liefbroer 2006). Economic instability increases financial and psychological stress for many couples, which should lead to a higher rate of divorce. At the same time, divorce often entails considerable costs of legal settlement, a move to a new household, and the purchase of consumer durables, while coping with a decline in disposable income. The "relative cost" of divorce should rise in uncertain economic times, thus lowering divorce rates (see Fischer and Liefbroer 2006 for more detailed review of the relevant arguments).

In addition to these main presumed linkages, more nuanced effects of economic conditions on divorce may be hypothesized—for example, through changes in women's economic opportunities and labor market participation (Hellerstein and Morrill 2010). Traditionally, studies since the 1920s have identified the pro-cyclical nature of divorce, espousing the relative costs

argument (see the research cited in South 1985, White 1990, and Fischer and Liefbroer 2006). South (1985), studying US data, posited that a more sophisticated analysis shows that the opposite effect prevails. This countercyclical view has recently been embraced by Gary Becker, who suggested that recessions tend to raise divorce rates (Luscombe 2008). The evidence remains mixed, however. Fischer and Liefbroer's (2006) analysis of divorce in the Netherlands, controlling for individual-level conditions, concluded that unfavorable economic circumstances lead to higher divorce rates. A simple time-series of consumer confidence and divorce in the Netherlands, not controlling for individual-level effects, reached the same conclusion. A contrary finding was reported by Hellerstein and Morrill (2010), whose macroeconomic model of divorce in the United States consistently predicts a decline in divorce rates during periods of rising unemployment.[17]

Economic crises and fertility in the twentieth century

The Great Depression

We noted earlier that historical time series of economic and demographic indicators suggest that business cycles were positively linked with fertility swings in the past. Analyses of the Great Depression of the 1930s generally confirm this observation, although the Depression did not affect the long-term decline in birth rates in the West. Caldwell (2008: 430 and Table 1) suggested that the fertility decline associated with the 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 a five-year period (1929–34), Van Bavel (2008) found no convincing correlation between GDP change and the net reproduction rate in 11 Western countries during the interwar period. Continuous long-term fertility decline was also noted by Greenwood, Shesadri, and Vandenbroucke (2006), who state that in the United States and Western Europe "it is hard to detect a strong structural break in fertility due to the Great Depression" (p. 205). Moreover, fertility decline halted in many countries around 1933 despite few signs of a return to economic prosperity (Caldwell 2006); paradoxically, in some cases a long-term fertility increase commenced at a time of widespread poverty and unemployment.

Because the Great Depression was particularly severe in the United States, its impact on US fertility has been studied with special interest. Most studies find that the crisis had an antinatal effect (e.g., Rindfuss, Morgan, and Swicegood 1988, Andorka 1978: 119). A classic investigation 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 positive correlation between the factory employment index and total live births in 1919–37; a similar finding of a pro-cyclical trend in births and marriages in the interwar period has been reached in a careful correlational analysis by Kirk and Thomas (1960) and by Becker (1960). Kirk and Thomas concluded that economic indicators such as annual trends in per capita income, industrial production, and employment explain nearly 60 percent of the fertility variance in 1920–57, of which about half influenced fertility indirectly via trends in nuptiality (p. 249). Ryder's (1980) decomposition has demonstrated that the Great Depression led to a substantial postponement of childbearing, which put downward pressure on the period TFR. The long duration of low fertility during the Great Depression can also be discerned in the US cohort fertility series (Campbell 1978, Cutright and Shorter 1979, Morgan 1996), mainly through the increase in the number of childless women and women who had only one child. Childlessness peaked among women born in 1901–10, who were the most severely affected by the Depression (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 recent recession the most severe postwar global economic downturn took place in the mid-1970s, following the huge rise in oil prices in 1973 and the subsequent energy crisis. Research on some European countries suggests that this recession—in a manner similar to the Great Depression—might have accelerated ongoing fertility decline and postponement, which had been underway in most countries since the late 1960s (e.g., Hobcraft 1996 for England and Wales; Lesthaeghe 1983 for Belgium). Demographic studies mainly attribute the observed decline to the sweeping changes in values and attitudes that also had their roots in the 1960s (e.g., Lesthaeghe 1983 and 1995); some studies suggest that the declines in fertility and marriage were facilitated by the rapid spread of the contraceptive pill (van de Kaa 2001, Goldin and Katz 2002).

De Cooman, Ermish, and Joshi's (1987) analysis concluded that fertility rates in England and Wales in the 1970s were 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 contraceptive pill use, partly induced by fears of the pill's side effects, 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 showed that fertility started falling in the period of rapid economic growth in the 1960s and that fertility decline was not more marked in regions with greater increases in unemployment.

In the United States, a sharp decline in the total fertility rate in the 1960s and 1970s, with a trough of 1.76 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 drop was probably unrelated to the recession and was less pronounced than in the previous years of economic expansion (Butz and Ward 1979a).

Economic shocks in Central and Eastern Europe after 1989

The sharp fertility decline in Central and Eastern Europe during the 1990s has frequently been attributed to the economic crisis, anomie, and disruption following the collapse of Communism (e.g. Ranjan 1999, UNECE 2000; see also the section on economic uncertainty below). Nevertheless, economic trends in the region differed from those of a typical economic recession experienced by Western European countries. Therefore, the post-Communist fertility decline should be seen as a specific case of profound economic and social transformation accompanied by the frequently severe symptoms of economic crisis. In almost all countries in the region, the economy stagnated or declined for many years, and unemployment emerged and rose sharply. In addition, many countries experienced high levels of inflation. The trends in 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 danger of a potential error of confusing a major shift toward delayed and lower fertility with short-term correlations associated with the economic cycle looms particularly large here (Philipov and Dorbritz 2003).

Many studies of individual countries in Central and Eastern Europe emphasize the negative effect on fertility of economic uncertainty, unemployment, inflation, and declining public support for families (see contributions cited in UNECE 2000, Philipov and Dorbritz 2003, Sobotka 2004 and 2008, and Frejka 2008). Deep economic depression contributed to the observed disruptions in fertility trends. However, a number of observations suggest that changing economic conditions can explain only part of fertility change in the 1990s. In many Central and Eastern European countries, rapid fertility decline began before the economic recession took place (UNECE 1999). The resumption of economic growth by the late 1990s initially did not produce a perceptible recovery of fertility (Philipov and Dorbritz 2003). Finally, countries that underwent a relatively smooth economic transformation, such as the Czech

Republic and Slovenia, experienced as pronounced a fall in total fertility rates as the countries that suffered protracted economic shocks, such as Bulgaria, Russia, and Ukraine (Philipov and Dorbritz 2003, Sobotka 2003).

Childbearing across Central and Eastern Europe has been postponed until later ages, inducing tempo distortions that explain a considerable portion of the TFR decline (Sobotka 2003, Philipov and Kohler 2001). The most precipitous shift in fertility took place in East Germany (former GDR) following German unification in 1990. The period TFR fell to an extreme low level of 0.77 in 1993–94 (Conrad, Lechner, and Werner 1996) and subsequently started a gradual recovery, converging to a West German level of 1.38 in 2008 (Goldstein and Kreyenfeld 2010). Although childbearing delays constitute an expected consequence of economic crisis, a puzzling observation is that the countries least affected by the economic crisis experienced the sharpest rise in the age at first birth (Sobotka 2003, Billingsley 2010). Thus, in contrast to the observations for some other regions, better economic performance and rapidly rising opportunity costs of childbearing in Central and Eastern Europe seemed to be more conducive to childbearing delays than was the economic recession.

Differential impact of recession by sex, education, and employment status

Unemployment and employment instability are perhaps the most salient consequences of economic recession. Employment instability has multiple forms, including layoffs and limited job opportunities, but also an increased incidence of involuntary part-time work, time-limited work contracts, changes of employers, and a threat of downward job mobility. Economic downturns are not indiscriminate with respect to age, skills, sex, migrant status, and number of children already born. They first affect male-dominated jobs with a 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 lower levels of job protection, are at greater risk of losing their jobs than prime-age workers. In contrast, women are often employed in public and service sectors such as health care and social services that are initially less affected by downturns (Verick 2009).

Rising differences by social and occupational status in the opportunity costs of childbearing are an important cause explaining some of the observed differentials in fertility response to economic recession. Because women still bear most of the time costs associated with childrearing, women with higher occupational position and higher wages face higher opportunity costs than those with low incomes, actual or potential (Schultz 1974, Becker 1981, Gustafsson and Kalwij 2006). Economic recession sharpens these disparities. Having a child may become too costly for better-educated women with a good employment position. They are motivated to increase their labor

market attachment and postpone childbearing for fear of losing their job and jeopardizing progress in their career. In contrast, among women with lower education and income, the chances of finding a good job deteriorate sharply during recession, which often makes parenthood relatively more affordable compared to the alternative of low-wage work or long-term unemployment. Childbearing could become a strategy for poorer women to structure their lives (Friedman, Hechter, and Kanazawa 1994) and to receive financial support from the welfare system, especially when cash transfers to women with children are substantial. In such cases, less-educated women are likely to increase their fertility in times of crisis and to further reduce their labor market attachment as a result (see also OECD 2009b). Thus, a recession may widen socioeconomic differentials in childbearing, stimulating a rise in childbearing rates among the less educated and a reduction in fertility among the better educated. The same case can be made for many migrants—insofar as they are entitled to various social, family, and child-related benefits—as the skill distribution of migrant populations in most European countries is skewed toward lower education levels (OECD 2007, UNESCO 2009) and migrants' employment is often highly sensitive to fluctuations in the labor market.

Sex-specific effects of unemployment

Research suggests that unemployment leads to different childbearing propensities for men and women. Among childless men, being unemployed or out of the labor force negatively affects the propensity to become a father. This outcome is consistently found in studies of individual countries (e.g., Simó Noguera, Golsch, and Steinhage 2002 for Spain; Kravdal 2002 for Norway; Lundström 2009 for Sweden) as well as in a comparative analysis for 14 industrialized countries (Mills, Blossfeld, and Klijzing 2005). Because a large majority of women interrupt work after giving birth and maternity and parental leave allowances usually do not fully compensate for their lost wages, males' breadwinning capacity remains of paramount importance for couples' childbearing decisions. In addition, most men earn more than their partners, and unemployment, low income, or unstable job position makes them unattractive for marriage or long-term partnership (Oppenheimer 1994).

For childless women, the situation is less clear-cut. Many studies find that women who completed education and are not in formal employment have a higher likelihood of giving birth than those employed (e.g., Francesconi and Golsch 2005 for the United Kingdom; Simó Noguera, Golsch, and Steinhage 2002 for Spain; Meron and Widmer 2003 for France; Liefbroer 2005 for the Netherlands), but this difference could be explained by selectivity. Some women decide not to pursue a career or choose to concentrate on family life prior to employment. In addition, some of these women may display weaker labor market skills and face more limited work opportunities.

In contrast to men, women's unemployment is often associated with higher first-birth rates (Francesconi and Golsch 2005 for the United Kingdom; Andersson 2000 for Sweden; Schmitt 2008 for Finland, Germany, and the United Kingdom; Özcan, Mayer, and Lüdicke 2010 for East Germany), although a negative relationship has been found in several countries (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, level of education, and parity (Vikat 2004).

Length of unemployment is a critical factor in the relationship between unemployment and first-birth propensity among women. Short-term unemployment does not have a marked impact (Schmitt 2008), while long-term unemployment typically shows a strong and negative effect for men and usually also for women (Adsera 2010), although the effect for women varies with different welfare policies and labor market contexts.[18] Long-term unemployment in France was found to be 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, which often differ from effects on first births. Kravdal (2002) showed that unemployment depressed first and second birth rates in Norway, but led to elevated third and fourth birth rates among men. Unemployed women in Finland also showed higher rates of third births (Vikat 2004). Further, the effects of unemployment are often differentiated by social status (see below). Educational, ethnic, and cultural selectivity of couples who desire larger family size might explain some of the observed contrasts in the effect of women's unemployment on childbearing behavior (e.g., Kravdal 2002).

Effects of income on the relationship between unemployment and fertility

The detrimental effects of unemployment on the income of prospective parents can be partly or fully offset by various welfare arrangements, which may explain some of the contrasting findings from different periods and countries. Although unemployment can lower the affordability of having children, generous unemployment benefits can reduce economic losses associated with loss of work. When employment opportunities are poor, child-related welfare benefits make the experience of unemployment more conducive for childbearing, as indicated by the findings linking generous parental leave allowances to higher fertility (d'Addio and d'Ercole 2005).

Andersson's (2000) analysis suggests that relatively high first-birth rates among unemployed women in Sweden are supported by both unemployment benefits and entitlement to parental leave that amounts to 80 percent of previous income for a duration of up to 390 days, with a flat rate for an

additional 90 days (OECD 2011). In particular, women receiving higher unemployment benefits had higher propensity to enter motherhood (Andersson 2000, p. 308). The introduction of a cash-for-childcare subsidy in Norway in 1998 was intended partly to provide a cash benefit to parents who preferred to care for their children at home rather than working and enrolling their children in public child care. The policy reduced incentives for women to participate in the labor market, as a fixed payment was provided regardless of employment status. The take-up was highest among the less educated, low earners, and immigrants (Schøne 2004, Aassve and Lappegård 2009). Marginalized groups may find such subsidies especially important for their childbearing decisions during periods of economic hardship, when job opportunities are particularly scarce.

The varied effects of uncertainty

The impact of uncertainty on fertility 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, Klärner, and von der Lippe 2008) and differentiated by social status. Uncertainty may raise fertility in poor countries, where children provide care and resources to elderly parents, but it is likely to lower fertility in countries where a substantial income is guaranteed to the elderly through public transfer systems (Sinn 1998).

High levels of uncertainty are generally expected to have a negative influence on childbearing decisions.[19] For instance, McDonald (2002: 430) posited that market capitalism with diminished welfare support leads to greater competitiveness and increased economic risks to individuals, who adopt risk-averse behaviors and refrain from reproduction. Bernardi, Klärner, and von der Lippe (2008) outlined two 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 personal uncertainty about the future course of one's life as a major consequence of job instability and stresses alternative coping pathways. A widely cited argument by Friedman, Hechter, and Kanazawa (1994) suggested that having children may serve as a strategy to reduce personal uncertainty. They wrote: "The principal global strategies available to ordinary individuals in the United States in the 1990s are stable careers, marriage, and children.… [T]he 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" (pp. 382–383).

Relevant research has been undertaken on Central and Eastern Europe, where the economic recession has been accompanied by a major restructuring of society and the economy. Ranjan's (1999) theoretical model suggests that declining fertility in Central and Eastern Europe was an "optimal reaction"

to income uncertainty during the economic transition. Conrad, Lechner, and Werner (1996) argued that sudden uncertainty about the future resulted in a temporary avoidance of marriage and childbearing in East Germany after German reunification in October 1990. More nuanced results come from studies analyzing individual data. Bhaumik and Nugent (2002) analyzed influences of 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 2010) used German panel data for 1984–2006 to study both objective measures (unemployment, low income) and subjective measures (economic worries, low life satisfaction) of uncertainty. She demonstrated that the impact of both types of uncertainty did not significantly alter first-birth rates when all women were considered, although the reaction to uncertainty differed sharply by education (see below).

Severe economic crises, such as those experienced in some post-Communist countries of Europe, may result in widespread feelings of distress, anxiety, and depression (see Philipov 2003, Philipov, Spéder, and Billari 2006, and Perelli-Harris 2006 for discussion of their effects on fertility intentions and fertility). Perelli-Harris (2006) found that a higher level of subjective well-being (as measured by life satisfaction and future outlook) had a strong positive effect on childbearing desires and actual childbearing of married women in Russia with at least one child. Their husbands' subjective well-being, however, had a significant positive effect on intentions only. Economic uncertainty also exerts an influence on fertility indirectly. An important conditioning factor is the availability of support from individuals' social networks. When individuals can 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 Fratczak (2007) for Poland; and Philipov, Spéder, and Billari (2006) for Bulgaria and Hungary.

Social status disparities in first-birth patterns

Women and men often react differently to economic recession depending on their social background, especially their educational attainment. Two mechanisms, which are not always separated in the literature, may explain this varied response. First, increased unemployment, work uncertainty, and lower income affect some social groups more than others. Second, these economic problems could elicit a stronger fertility reaction in some population groups than others.

Less-educated and low-skilled men, who are most affected by economic recession, are likely to show the largest decline in the likelihood of entering

parenthood. Oppenheimer, Kalmijn, and Lim (1997) emphasized that the factors which constitute an obstacle for marriage among men often form a combination of low education, stop-gap employment, part-time jobs, and low earnings. All of these effects are likely to be exacerbated during recession.

The evidence suggests that highly educated women react to employment uncertainty by adopting a postponement strategy, especially if they are childless, whereas less-educated women often increase or retain their rate of entry into motherhood under economic uncertainty (e.g., Özcan, Mayer, and Lüdicke 2010 for Germany). This conjecture is supported by the persistence of early childbearing among the most disadvantaged women (in terms of education, income, or labor market position) in Central and Eastern Europe during the period of economic transition (Kharkova and Andreev 2000, Kohler and Kohler 2002, and Gerber and Cottrell 2006 for Russia; Kantorová 2004 for the Czech Republic; Kreyenfeld 2010 for East Germany; Perelli-Harris 2008 for Ukraine). During the early 1990s recession in Finland, women with low education were more likely to have a child when unemployed (Vikat 2004). Kreyenfeld's (2005 and 2010) studies are particularly informative in analyzing differential responses to uncertainty. She shows that, in line with intuitive expectations, unemployment, economic worries, and low levels of life satisfaction lead to a sharp reduction in rates of first births among highly educated women. However, among the least-educated women she finds a minor *positive* effect of economic worries and low life satisfaction on first births and a strongly significant *positive* effect of unemployment on first-birth risks.

Vulnerability of young adults to recession

The evidence discussed above often indicates that economic recession primarily affects young adults (Schmähl 2003, Verick 2009). In turn, the fertility response to economic recession is usually most pronounced among younger people, in part also because most of them are childless and often aim to fulfill the common prerequisites for family formation and childbearing: achieving secure income, acquiring good housing, and accumulating resources (Hobcraft and Kiernan 1995, Kravdal 1999, Neels 2010). Pension and labor market reforms in recent decades have tended to make the young increasingly disadvantaged (Skirbekk, Stonawski, and Sanderson 2010). Examples include labor market liberalization in Spain, which created an "insider/outsider" labor market in which mainly young adults lost employment stability (de la Rica and Iza 2005); or European pension reforms that often left younger cohorts facing the double burden of pre-funding their own pensions while providing transfers for the current elderly. Across Europe, younger people have been exposed to increasingly precarious, lower-paid, and lower-quality employment, giving them uncertain future prospects (Mills, Blossfeld, and Klijzing 2005). The economic recession implies fewer new jobs and a hiring freeze in

many firms and institutions. Trade unions tend to emphasize employment stability for seniors rather than for the young (Oswald 1987).

The relative worsening of the 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 of the delay in family formation, as many couples wait to have children until they have secured an adequate level of income. Two additional factors that determine childbearing decisions among young adults, housing availability and prolonged education, are often affected during economic downturns.

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 growth of disposable income for young adults has slowed in recent decades, housing prices have risen considerably, often more than doubling since the early 1990s (OECD 2005). The rise in housing costs often leads to postponed and lower fertility (Mulder 2006, Rindfuss and Brauner-Otto 2008, Simon and Tamura 2008), especially in countries where home ownership is a precondition for family formation and rental housing is limited. Until 2007, economic prosperity and availability of cheap credit and mortgages had to some extent counterbalanced the negative effects of rising housing costs. Cheap credit fueled a housing construction boom in many countries and encouraged couples to acquire spacious apartments and houses. Because living in spacious housing and a child-friendly environment has been associated with higher fertility (Kulu and Vikat 2007, Ström 2009), the boom in housing construction could have contributed to rising fertility in the early 2000s (Leland 2008).

The decline in housing prices during the recent recession has in most countries been modest in comparison with the increases observed in the last two decades (Global Property Guide 2009, Goldman Sachs 2008). Home ownership often entails large initial debt, which becomes difficult to service in times of economic uncertainty. In addition, mortgages became more difficult to obtain as credit conditions tightened at the beginning of the recent downturn, and the construction of new houses plummeted, reducing availability. On balance, we expect that in most countries the negative effects of lower disposable income, diminished housing construction, and reduced availability of mortgages will lead to postponement of births. This conjecture is supported by a rise in the proportion of young Americans who have returned to their parents' household (Wang and Morin 2009).

Lack of employment opportunities is likely to contribute to prolonging the time young people spend in education as the value of human capital increases in a competitive labor market and education reduces the risk of future unemployment and job instability (Abowd and Lemieux 1993, Kohler, Bil-

lari, and Ortega 2002). Many young people will seek to improve their work prospects or simply enroll in education because being a student can signal a higher social status than being unemployed or out of the workforce (Dornbusch, Gentilini, and Giavazzi 2000). In Italy, Spain, Sweden, and parts of Central and Eastern Europe, the educational system expanded rapidly and the numbers of young people enrolled at universities surged during economically unstable times in the 1980s and 1990s (e.g., Hoem 2000, Kohler, Billari, and Ortega 2002, Kotowska et al. 2008).

Further expansion of tertiary education could lead to later and fewer births as better-educated women tend to have higher levels of childlessness and lower rates of fertility (Blossfeld and Huinink 1991, Skirbekk 2008). Billari, Manfredi, and Valentini (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, Kohler, and Prskawetz (2004) investigate the influence of Swedish school-age regulations, which (in a random way) affect students' school-leaving age, and find that a higher school-leaving age results in a significantly later timing of marriage and childbearing.

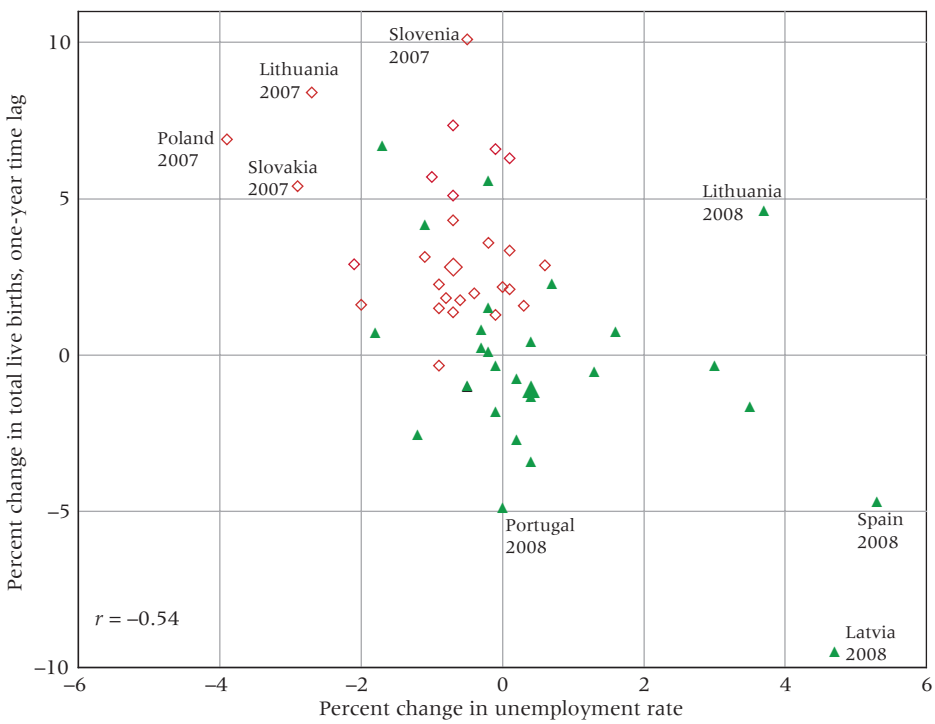
The recent recession: Preliminary evidence

Although the recent economic recession, starting in 2008, has been declared over in most countries it affected, its impact on fertility rates across the developed world may extend into the next few years. Two factors are mainly responsible for this prolonged effect: a time lag between the recession and its fertility impact and the additional effect of cuts in government expenditures, necessitated by rising budget deficits. Thus, recent data on births and fertility for 2009 give only a preliminary glimpse of the fertility responses to the recent recession.

These data are broadly in line with the past evidence presented above. In the United States, where the recent economic downturn led to a doubling in the unemployment rate from 5 percent in December 2007 to 10 percent in October 2009 (Martínez-García and Koech 2010), birth rates started declining in 2008. This decline accelerated in 2009, when the preliminary estimate of the period TFR of 2.01 stood appreciably below the period TFR of 2.12 recorded before the onset of the recession (Hamilton, Martin, and Ventura 2010). A report by Livingston and Cohn (2010) shows a close correlation between per capita income and the birth rate in 25 US states since 2000 and links the recent fall in the number of births to the recession. A survey conducted by the Pew Research Center supports this view, with many young adults reporting that they have postponed family formation because of the recession: 21 percent of respondents aged 25–34 claimed they postponed marriage and 15 percent that they postponed having a child (Wang and Morin 2009).

Similarly, the recent recession marked a trend reversal in fertility rates in Europe, following their rise over the decade through 2008 (Goldstein, Sobotka, and Jasilioniene 2009). Changes in the number of live births in the European Union suggest a close link between the recession and fertility trends. In 2008, the last year when most of the realized births had been planned and conceived in economically better times, 26 of the 27 countries of the EU recorded a rise in the number of live births, with an EU-wide increase of 2.8 percent over the previous year. Germany was the only country that recorded a slight decline in 2008. In contrast, in 2009, 15 EU countries registered a fall in the number of births, with the EU-wide total down by 1.1 percent over 2008 (Eurostat 2010). Spain, where unemployment surged to 20 percent, was among the countries that have experienced a sharp reversal in fertility rates, with the period TFR falling from 1.46 to 1.40 between 2008 and 2009 (INE 2010). Figure 1, which

FIGURE 1 Relationship between (a) annual change in unemployment rate in 2007 and 2008 (4th quarter) and (b) annual change in the number of live births one year later, European Union countries. Data pertaining to year-to-year unemployment change in 2007 (pre-recession) and births change in 2008 are marked by diamonds; data pertaining to year-to-year unemployment change in the last quarter of 2008 (start of the recession) and births in 2009 are marked by triangles.



NOTES: Enlarged markers show the data for the European Union as a whole. Years listed next to data points for selected countries correspond to the year when change in unemployment rates was measured; change in total births was measured one year later.
DATA SOURCE: Eurostat 2010.

plots the annual change in unemployment rate in 2007 and in the fourth quarter of 2008 in the EU countries against the annual change in the number of births one year later, shows a close negative correlation between these two trends (the correlation coefficient reached –0.54). The European Union as a whole shifted from the upper-left quadrant of declining unemployment in 2007 and rising births in 2008 to the lower-right quadrant of rising unemployment in 2008 and declining number of births in 2009.[20]

A particularly pronounced fertility fall occurred in Latvia, one of the countries worst affected by the economic crisis, where only drastic reductions in the government budget and an ensuing decline in salaries saved the country from bankruptcy. As Latvia's GDP plummeted by 18 percent in 2009 and the unemployment rate soared from 5 percent at the end of 2007 to 20 percent at the beginning of 2010, the fertility reaction was almost immediate. A previously gradual rise in the period TFR, reaching 1.44 in 2008, reversed sharply, falling to an estimated 1.16 in 2010 (our estimate is based on the total number of births reported by the Central Statistical Bureau of Latvia). As depicted in Figure 2, birth trends inversely mirrored trends in the unemployment rate with a time lag of only nine months. The most recent data point in Figure 2 indicates a rise of 6.4 percentage points in the unemployment rate between the first quarter of 2009 and the first quarter of 2010. By

FIGURE 2 Change in unemployment rate by quarter (related to the same quarter in the previous year) and change in the number of live births nine months later (related to the same quarter in the previous year), Latvia 2007–2010

NOTES: Unemployment rate pertains to total population aged 20–64 and is based on quarterly labor force surveys. Quarterly changes in unemployment and in live births are compared with the same quarter one year earlier in order to eliminate the influence of seasonality and short-term fluctuations.
SOURCES: Central Statistical Bureau of Latvia 2011 and Eurostat 2011.

contrast, the number of live births nine months later declined by 5.8 percent in a year-to-year comparison (i.e., the number of births in the last quarter of 2010 was compared to the number of births in the last quarter of 2009). The Latvian example, so far unmatched in other developed countries during the recent recession, clearly suggests that a severe economic recession may spark an unusually rapid and pronounced fertility reaction.

Conclusions

We have provided a broad review of research on the effects of economic recessions on fertility, discussing both the empirical evidence and the mechanisms and pathways through which various symptoms of recession affect aggregate fertility rates and individual fertility behavior. We view our work as a foundation for a more systematic investigation. Future research should investigate both theoretical and conceptual issues: a precise delineation of the economic and fertility indicators used, envisioned time lags between economic recession and fertility, and contextual and policy factors that can influence the recession/fertility relationship. In addition, the model design, pertaining to the expected influences of economic levels, trends, or changes in trends on fertility, often needs to be better specified. Many of the published studies we reviewed above are vague or muted about these important theoretical and methodological issues.

Two types of studies dominate the research. The first one has linked fertility levels to economic conditions, often as a snapshot at one point in time. This research is usually motivated by aims other than studying the effects of business cycles. While it can provide valid insights and inferences about some of the impacts of economic recession, these studies should be interpreted with caution. The second type takes a more dynamic approach, examining whether a change in economic conditions leads to a change in fertility. This design is more appropriate (and more frequently used) for studying the impact of economic recession. Other research designs are infrequent.

The evidence is not unanimous, but most studies find that fertility tends to be pro-cyclical, reacting to the ups and downs of the business cycle. These cyclical waves are usually relatively small (typically, on the order of a few percentage points) and of short duration. They can therefore be overshadowed by long-term secular trends in fertility caused by factors other than economic recession. This fact explains why a number of studies of fertility during the Great Depression of the 1930s and again in the 1970s found no convincing link between the recession and fertility change: both periods saw a continuation of long-term fertility declines that had started well before the recession began. The temporary fertility decline during recession is frequently interpreted as a result of childbearing postponement, an interpretation that is especially pertinent to first births. Using familiar terminology, we can say that recession leads mainly to a tempo effect and only a minor, if any, quantum

decline in fertility. A delineation of these two components of fertility during times of economic crisis has been rarely attempted, however (for an exception, see Örsal and Goldstein 2010).

Trends in fertility rates often show correlation with GDP growth. Our simple analyses have illustrated this relationship for low-fertility developed countries after 1980. Periods of economic recession or stagnation were frequently followed within one or two years by a decline in period fertility rates. However, measures of unemployment and consumer confidence appear to be more suitable indicators that reflect more closely the impact of the downturn on individuals and that were repeatedly found to be related to fertility swings, including those during the recent recession. The available evidence indicates that a *change* in unemployment or in consumer confidence matters more for fertility changes than the *levels* of these indicators.

We discussed a number of interrelated factors and mechanisms that affect fertility in combination and whose effect is often difficult to single out: experiences of unemployment and work instability, declining wages, rising economic uncertainty, difficulties in acquiring adequate housing, and spending more time in education. Findings on social status differentiation in the fertility response to economic recession cast doubt on the general validity of the intuitively clear idea that uncertainty causes postponement of births. In combination, these differentiated reactions typically push fertility rates during recession to a lower level than they would otherwise have been.

The most important reason why recession is likely to exert downward pressure on fertility is the rise in unemployment and in job instability, which particularly affects young adults. Our discussion of opportunity costs of childbearing suggested that better-educated women in particular may perceive childbearing to be an especially risky strategy during recession and are likely to react by postponing their childbearing plans. In contrast, among men, the least-educated individuals with precarious work position will face more difficulties finding a partner with whom to start a family. Overall, many couples will receive lower wages and have fewer employment opportunities, and their tighter budget would reduce the affordability of children. If this income effect dominates the changing opportunity costs, the net impact of recession would be a reduction in fertility—as is observed in most aggregate-level analyses.

The relationship between economic recession and fertility is contingent upon social and institutional arrangements. Governments seek to moderate the effects of adverse economic conditions on fertility through employment and family policies (Matysiak and Vignoli 2008, Thévenon 2011). Finland is a telling example of a policy that unintentionally led to a slight rise in period fertility at a time of deep economic recession in the early 1990s. The introduction in the mid-1980s of a child allowance to parents who remain at home with a child below age three provided an attractive alternative to unemployment and shrinking work opportunities for many women (Vikat 2004). More recently, a slight rise in fertility rates in Iceland despite severe

economic recession in the first half of 2009 generated media attention, which identified generous parental leave as the cause (e.g., Moorhead 2009). Policies have an important symbolic function, too, giving signals about desirable behavior; thus, 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: 4). At the same time, well-intentioned policies could become ineffective or even counter-productive if unemployment and uncertain employment remain entrenched for long periods of time.[21]

Although much can be learned from the experience of past recessions, the recent economic downturn is in many ways distinct and should caution against over-interpreting the studies reviewed above. Unlike other recent recessions, such as the 1997–98 financial crisis especially affecting Asia and the Russian Federation, or the Scandinavian and Eastern European recession of the early 1990s, the recent recession has strongly affected economies and government budgets across all developed countries. The cultural and institutional context in the developed world is substantially different from the context prevailing during past crises. More women than ever are participating (and competing with men) in the labor market, most couples use reliable contraception that enables them to postpone childbearing, and welfare systems are being increasingly burdened by social security and health costs linked to expanding numbers of elderly as well as by massive government debts inherited from the past or accumulated during the recession. Women's mean age at first birth has reached around 28 years in most countries of Europe as well as in Japan (VID-IIASA 2010), rising by three to five years since the early 1970s. This leaves women and couples less flexibility to postpone parenthood until a later age. In many countries, the current recession coincides with pension reforms that raise the age of retirement, implying that fewer older workers are leaving the labor market and that younger entrants have to compete for fewer jobs and accept lower wages. All of these factors can affect reproductive decisions, potentially strengthening the negative effects of a recession on fertility.

The recent recession can be treated as a natural experiment that can inform both theoretical and empirical research on fertility responses to changing economic circumstances in different societal contexts. The preliminary evidence, mostly pertaining to birth trends in 2009, shows that the previous upturn in fertility rates across the developed world has changed to stagnation or decline in most countries. In a few cases, including the extreme case of Latvia, the recession-driven fertility decline may imply a return to lowest-low fertility (with period TFR below 1.3), a phenomenon that had briefly affected about half of European countries in the late 1990s and the early 2000s (Kohler, Billari, and Ortega 2002, Goldstein, Sobotka, and Jasilioniene 2009). Only if the economic recession and the resulting high unemployment became

protracted—as was the case during Japan's "lost decade" in the 1990s— might its fertility impact also become more lasting, potentially affecting cohort fertility rates. Massive cuts in public spending in many developed countries, including Spain and the United Kingdom, aimed at reducing rising budget deficits, will also affect social and family-related expenditures and potentially also fertility. Hence, the consequences of the recession could affect fertility in two stages—first, directly through rising unemployment and economic uncertainty and later through a decline in monetary support to families with children. In analogy to a widely discussed notion of a double-dip recession, these two stages could lead to a double-dip fertility decline. However, the effects of the recent recession will not be universal and unidirectional, since institutional factors and policies intervene at every step in the link between economic downturn and fertility behavior.

Appendix

Additional illustrations of the association between GDP change and change in period TFR

In addition to the 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 subsequent changes in period total fertility rates (TFR). This preliminary and largely illustrative exercise needs further elaboration and suffers from a number of potential biases, including the sensitivity of the period TFR to changes in the timing of childbearing (Bongaarts and Feeney 1998, Sobotka and Lutz 2009). Because the effects of recession on childbearing behavior are differentiated by sex, age, partnership status, socioeconomic status, parity, and institutional context, our analysis of associations for individual countries and for the pooled dataset for all countries should be seen as a rough assessment of the magnitude to which the TFR trends respond to GDP swings during recession.

We use data for 26 OECD countries (all member countries except Chile, Estonia, Iceland, Israel, Luxembourg, Mexico, Slovenia, and Turkey) for the period 1971–2008. For a few countries the time series of annual GDP data provided by OECD (2009a) 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 GDP change and TFR change in order to accommodate duration of pregnancy and time needed for couples to react to changed economic conditions and alter their childbearing intentions and reproductive behavior.

Table A1 presents correlation coefficients between GDP change and change in the period TFR for all cases in which GDP increased by less than 1 percent or declined, also including the pre-1980 period (all 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 GDP

TABLE A1 Correlation between GDP change and period TFR change in years when GDP increased by less than 1 percent, 26 low-fertility countries, 1956–2008

	Cases (country-years)	Correlation coefficient	
		One-year lag	Two-year lag
All cases, 1956–2008	150	0.25	0.05
1980–2008 only	120	0.27	0.10
Only recessions (GDP growth<0%), 1980–2008	62	0.26	–0.02
Only recessions (GDP growth<0%), 1980–2008 excluding Finland	59	0.38	0.01

NOTE: The latest data on births pertain to 2008. The most recent GDP data pertain to 2007 (one-year time lag) or 2006 (two-year time lag), respectively.
SOURCES: See Table 1.

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

One could argue that the four Central European OECD members (as of 2009 the Czech Republic, Hungary, Poland, and Slovakia) should be excluded since the economic crisis in the 1990s in this region was linked to the widespread societal and economic transformation after the collapse of state socialism. However, their exclusion does not lead to perceptible change in the results.

The weak correlation between changes in GDP and period TFR during 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, covering all periods for which data are available (thus, also the periods of robust GDP growth) in order to obtain a meaningful number of observations for each country. We look at both one-year and two-year time lags and show only the coefficients that were above 0.4 in absolute terms.

The country-specific patterns are mixed, with countries differing substantially in their GDP/TFR relationship as well as in their time lags showing a stronger association. Before 1980, during a time of generally declining fertility, six of the ten countries that showed 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 agrees 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 countries show a positive (pro-cyclical) association between economic growth and period fertility (correlation of 0.4 or stronger) 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 changes in GDP and TFR when using the longer time lag of two years.

TABLE A2 Correlation between GDP change and period TFR change in 26 low–fertility countries, 1956–2008

	Before 1980			1980–2008		
	Period	Time lag (years)	Coefficient	Time lag (years)	Coefficient	Exceptions
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	NA			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	NA			2	0.51	1992–2008 only
Ireland	1971–79	..	..	1	0.63	
Italy	1971–79	..	..	..	..	
Japan	1971–79	1	0.62	..	..	
Korea, South	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	NA			..	..	1991–2008 only
Portugal	1971–79	1	–0.58	..	..	
Slovakia	NA			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.

Notes

Figures in this article are available in color in the electronic edition of the journal.

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1 On the aggregate effect of recession on public health and mortality, see the recent studies by 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); for an overview of the recent evidence on that subject, see Castles and Miller (2010).

2 Guynn 2008. This article quotes Dr. Khalil Tabsh, chief of obstetrics at the University of California: "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," 30 May 2008, «http://www.newsweek.com/id/139267») and an MSNBC feature by Melissa Schorr from 14 January 2009,

titled "Shaky economy means 'bye-bye baby' for some" («http://www.msnbc.msn.com/id/28624299/»).

3 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».

4 It is plausible that long-lasting recessions cause a long-lasting disruption of childbearing patterns, affecting cohort fertility as well. However, we are not aware of studies that explicitly focus on the impact of the duration of recession on fertility.

5 While the global gross domestic product (GDP) contracted by 0.6 percent in 2009, 33 countries classified by the International Monetary Fund as advanced economies saw a GDP fall of 3.2 percent, while the other 149 countries combined experienced a diminished 2.4 percent increase in GDP (IMF 2010).

6 There is no universally accepted definition of recession. Most experts define recession as a decline in GDP in two consecutive quarters, but the National Bureau of Economic Research in the United States, charged with officially declaring a recession, takes a broader number of measures of economic activity (Claessens and Kosse 2009; see also «http://recession.org/definition»), Note that *economic depression* usually refers to a severe recession, in which the GDP shrinks by more than 10 percent (Claessens and Kosse 2009).

7 We thank one of the reviewers who has directed our attention to methodological issues discussed here.

8 In studies using individual-level data, a thorough investigation of postponement requires modeling changes in the shape of a birth hazard function over time. See Timæus and Moultrie (2008: Figure 2) for an illustration of postponement in an analysis of birth hazards by duration since previous birth. Many researchers make inferences about postponement by simply comparing birth hazards between different groups of respondents specified by age, or even without age specification. Such interpretations are often subjective, as lower birth hazard in one group may signal both a lower lifetime birth hazard and birth postponement. Also, in an aggregate-level period analysis, it is often impossible to distinguish between the quantum decline and effects on the timing of childbearing, which jointly affect the aggregate indicators of fertility such as the period total fertility rate (TFR). This methodological difficulty partly stems from the relatively short-term impact of most recessions.

9 Some time lag should be expected even if couples responded rapidly to changing economic conditions, considering the time between the initiation of pregnancy attempts and achieving a conception and between conception and childbirth.

10 The period of rapidly declining fertility rates in the 1970s appears to be an important exception to this general observation, when fertility trends in many countries were either insensitive to the business cycle or were counter-cyclical (see below and the Appendix).

11 The pro-cyclical association was significant at lag one year only in Cuba; it was minor and insignificant in Argentina, Colombia, Costa Rica, and Guatemala. The coefficients for six countries (Chile, El Salvador, Mexico, Panama, Venezuela, and Uruguay) suggested that economic recession might have led to a slight increase in marital births, but none of the coefficients obtained was significant.

12 The index of consumer confidence in the Netherlands is a composite indicator derived from a monthly household survey. It is based on five questions concerning current and envisioned economic circumstances in the country, the current and envisioned financial situation of respondents' household, and their assessment of whether it is the right time to buy expensive items (see more details at «http://www.cbs.nl/en-GB/menu/_unique/_concept/default.htm?postingguid={F8C48716-81BF-42E1-BD83-032463174E98}&concept=Explanatory+notes»).

13 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 –22 in 2009 (CBS Statline 2011, accessed 9 March 2011 at: http://statline.cbs.nl). A regression model used by Fokkema et al. (2008) predicted that the TFR in the Netherlands would fall by (3.0*0.04) = 0.12 between 2009 and 2011 (assuming that the TFR reacts with a lag of two years).

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

15 An additional correlation analysis for Belgium showed that unemployment did not greatly affect the progression to second and higher-order births (Neels 2010: Table 2). The study posited, however, that the inflation rate and purchasing power were more closely related to the progression rate to second and later births.

16 This aggregate effect was linked to a rise in female unemployment in Norway from 2 percent to 4 percent and in male unemployment from 2 percent to 6 percent; these are huge relative jumps, but rather modest levels in comparison with most other countries of Europe.

17 Based on their model, the recent recession in the United States, marked by a 5 percentage point rise in the unemployment rate, would reduce divorce rates by 8.3 percent (Hellerstein and Morrill 2010: 6).

18 Schmitt's (2008) analysis of 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). Özcan, Mayer, and Lüdicke (2010: Table 6) reported a positive effect of unemployment duration on the first-birth rate in East Germany (especially for highly educated women), while they reported a slightly negative effect for West German women.

19 One important distinction is often missing in studies discussing the effects of uncertainty, namely, to what extent uncertainty originates from the personal conditions of individuals and their families and to what extent it is caused by observing other people's experiences or by following media coverage of negative economic, employment, and societal trends.

20 Some countries, however, recorded a continuous increase in period fertility rates. These were mostly countries relatively little affected by the recession (e.g., Norway and Poland). However, a few exceptions, including the recession-affected Iceland, where the period TFR rose from 2.09 in 2007 to 2.22 in 2009, suggest that social policies or other factors may offset the expected negative impact of the recession on fertility.

21 Very long parental leave allowances may be detrimental to fertility rates (d'Addio and d'Ercole 2005, OECD 2011), 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 young entrants to the labor market, and of workers in part-time and precarious jobs and, in effect, dampen fertility (Adsera 2005).

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