

Vanishing Children: From High Unemployment to Low Fertility in Developed Countries

By ALICIA ADSERA*

During the last four decades the average total fertility rate in OECD countries witnessed a dramatic fall: from 2.9 in 1960 to 2.0 in 1975 and then to 1.6 in the late 1990s (reaching 1.25 in Southern Europe). With the exception of the United States, all advanced countries now have fertility rates well below the replacement rate of 2.1. In the absence of either sharp changes in fertility behavior or large inflows of immigrants, their populations are set to shrink, particularly in Europe. Still, within this generalized fall, cross-national differences in fertility behavior have remained significant. By 2000, fertility rates ranged from 2.1 in the United States and over 1.8 in France and Norway to less than 1.3 in Greece, Italy, and Spain.

Most standard accounts attribute the fall in fertility rates to a shift in personal preferences over the size of the family due to either changes in religious beliefs or growing female participation in the labor market. Yet, even though the ideal number of children for men and women 20–34 years old has declined, it is fairly similar across the European Union at around the replacement level of 2.1 (Eurostat, 2001). Hence, the sources of cross-national variation in fertility behavior must lie somewhere else. As women have joined the labor force, fertility rates have adjusted as a function of the institutional structures that shape the job market and determine its long-run unemployment rate. Exploiting the considerable variation of fertility rates and employment conditions across industrial countries, this paper shows that the current demographic

transition is ultimately associated with the constraints of the labor market where fertility decisions are taken.

I. The Puzzle: Labor Markets and Fertility

Starting in the 1960s the massive entry of women in the labor market was coupled with a fall in fertility rates. Female labor participation in OECD countries went up from 40 percent in 1960 to about two-thirds today. Figure 1, which displays total fertility rates and female participation rates for 23 OECD countries in 1975, shows that fertility was lower in countries where women had entered the job market ($R^2 = 0.18$). The sharp decrease in fertility rates could be explained as the logical outcome of competing demands for women's time and the rise in the opportunity cost of having children (William Butz and Michael Ward, 1979; Gary Becker, 1981).

However, as female labor participation kept growing, that negative relationship reversed. By the late 1980s it became positive. Figure 2 reproduces fertility and participation rates in 1996 ($R^2 = 0.43$). Those countries with the lowest levels of participation, such as Greece, Italy, or Spain, also showed the lowest fertility rates, around 1.2–1.3.

The change in the sign of the correlation between fertility and female participation coincides with a sharp rise in unemployment. Unemployment was less than 3 percent before 1975 and went up to about 10 percent in the 1990s. Long-term unemployment became particularly substantial. By 1990, around 50 percent of those unemployed in the European Union had been out of work for more than 12 months. The long-term unemployment rates ranged from around 10 percent in Nordic countries to over 60 percent in Southern Europe.

* Department of Economics, University of Illinois at Chicago, 601 S. Morgan St., Chicago, IL 60607; Population Research Center, University of Chicago; and IZA (e-mail: adsera@uic.edu). Financial help from the Great Cities Institute at the University of Illinois and from NICHD is gratefully acknowledged.

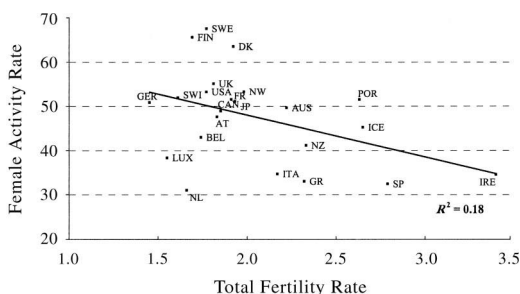


FIGURE 1. FEMALE ACTIVITY RATE AND TOTAL FERTILITY RATE IN OECD COUNTRIES, 1975

Notes: Female activity rate is the labor-market participation rate (percentage).

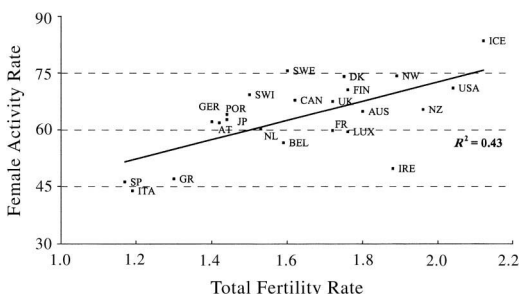


FIGURE 2. FEMALE ACTIVITY RATE AND TOTAL FERTILITY RATE IN OECD COUNTRIES, 1996

Notes: Female activity rate is the labor-market participation rate (percentage).

The increase in unemployment hit women particularly hard. In the European Union the average female unemployment rate rose from 2.5 percent in 1970 to 6.5 percent in 1980 and then to around 11 percent from the mid 1980s to the late 1990s. In countries with high female unemployment, the gender gap in both short-term and long-term unemployment rates was large for the young and for married women, especially those with young children (Ghazala Azmat et al., 2004). In Southern Europe, female unemployment rates climbed above 15 percent in Greece and Italy and above 20 percent in Spain by the mid 1990s, 7–12 points higher than the corresponding rates for males. The rapid feminization of the labor force in countries with traditionally low female participation collided with rigid labor-market institutions geared toward prime-aged male workers and resulted both in relatively higher female unemployment

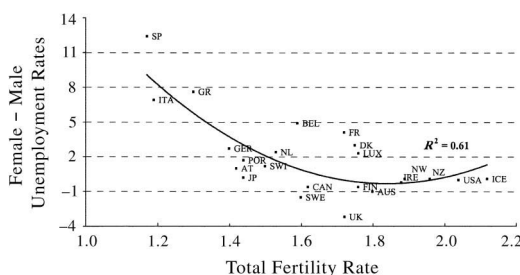


FIGURE 3. DIFFERENCE BETWEEN FEMALE AND MALE UNEMPLOYMENT RATES AND TOTAL FERTILITY RATE IN OECD COUNTRIES, 1996

Notes: Unemployment rates are percentages.

rates and in lower fertility.¹ Figure 3 shows that, among OECD nations in 1996, the total fertility rate was lower the larger the gap between female and male unemployment rates.

A standard microeconomic model of fertility predicts that the associated fall in opportunity costs makes a temporary unemployment spell a good time for childbearing. Yet persistent unemployment, particularly hitting young workers and female workers of all ages, should have the opposite effect. Joblessness in this context carries a large lifetime income penalty. Its associated drop in human-capital accumulation significantly increases the risk of future unemployment and leads to lower future wages and benefits. This negative income effect is particularly severe when the market exit happens early in a career. Since maternity demands may require a short (partial) withdrawal from the market, women would rather postpone childbearing until they accumulate sufficient human capital. In addition, long-term aggregate unemployment also endangers spousal earnings and trims down expected household income. This further reduces overall fertility.

¹ Giuseppe Bertola et al. (2002) show that countries with high employment protection have lower unemployment rates of prime-aged individuals compared to younger workers and that union wage-setting institutions “lower the male unemployment rate relative to the female unemployment rate by 4.4–6.2 percentage points” (p. 29). Strict regulation has also led to the expansion of temporary employment that hampers long-run family planning (see the June 2002 issue of the *Economic Journal*).

TABLE 1—COX PROPORTIONAL HAZARD MODEL OF TRANSITION TO A BIRTH (1980–2001)

Variable	First child	Second child	Third child
Female – Male unemployment ($t - 1$)	0.978 (-10.1)	0.983 (-6.46)	0.966 (-7.10)
Long-term unemployment ($t - 1$)	0.996 (-5.44)	0.993 (-8.58)	0.983 (-7.18)
Subjects:	47,906	24,110	16,171
Failures:	22,111	15,792	5,035

Notes: The table presents estimated hazard ratios with grouped robust variance (t statistics in parentheses). Models include the education, birthplace, and fertility history of each individual, year dummies, and maternity benefits, log income per capita, and shares of government employment and self-employment in each country.

II. Data and Methodology

I use the 1994–2000 waves of the European Community Household Panel Survey to reconstruct fertility histories of around 48,000 women in 13 European countries (Austria, Belgium, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom). I limit the sample to women 40 years old or younger at the time of each interview. Older women would be more likely to have children living outside the household who would not be counted by the survey.

I estimate transitions to the first three births with a Cox proportional-hazard model. For a woman i who enters a state (e.g., first birth) at time $t = 0$, the (instantaneous) hazard rate function at time $t > 0$ is assumed to take the proportional-hazards form

$$(1) \quad \lambda_{it} = \lambda_0(t) e_i \exp(\sum \beta_j X_{ij})$$

where $\lambda_0(t)$ is the nonparametric baseline hazard function; X_{ij} is a set of j covariates summarizing observed differences between individuals and between countries where individuals live at time t ; and β_j are the parameters to be estimated. The dependent variable is months to a birth from either the previous birth or, for the first birth, from age 16.

While synthetic indexes such as total fertility rates can be subject to temporary over- or underestimate if there are sudden shifts in the timing of births, the analysis of the transition to each birth produces a more accurate account of the underlying changes in behavior.

I use two measures of job uncertainty for female workers: the difference between a country's female and male unemployment rates and the percentage of all unemployed that have been out of work over 12 months.²

I control for birthplace, education, mother's age at first birth, and gender of previous children. Additional controls of country conditions include prevalence of self-employment, the share of public-sector employment, GDP per capita (in terms of purchasing-power parity, 1995), an index of maternity benefits, and time dummies. I obtained data on the structure of the labor market from the OECD *Labour Force Statistics* and data on maternity benefits from *Social Security Programs throughout the World* (U.S. Department of Health and Human Services). The sample starts in 1980. Time-varying economic conditions are lagged one year. Results are robust to the inclusion of country dummies.

III. Results

Table 1 presents the estimated hazard ratio of the two covariates of interest (the gender unemployment gap and long-term unemployment) for the first three children. The hazard ratio on the difference between female and male unemployment rates is below 1 in all three columns and significant at a 1-percent level. This means that a higher gender gap in unemployment within a country is accompanied by a slowdown in the transition to motherhood and to further

² Data on long-term unemployment starts in 1985 for Portugal and in 1991 for Luxembourg, Italy, and Greece.

TABLE 2—PREDICTED PROPORTION OF WOMEN HAVING EXPERIENCED A BIRTH

Birth category	F – M rate = 0		F – M rate = 10	
	LTUR = 20	LTUR = 60	LTUR = 20	LTUR = 60
By age 35	0.819	0.770	0.744	0.691
By 8 years since first child	0.832	0.778	0.740	0.679
By 8 years since second child	0.460	0.352	0.331	0.248
Number of children:	1.81	1.58	1.48	1.28

Notes: “F – M rate” is the difference between female and male unemployment rates; “LTUR” is the long-term unemployment rate. The table presents results of simulations from estimates in Table 1. All other covariates are set at the sample mean. The number of children is obtained by adding the predicted proportion of women at different parities in each column.

births. The hazard ratio is the lowest in the transition to a third child. Further, in countries where long-term unemployment is rampant, childbearing occurs significantly later.

Table 2 presents the predicted proportion of women who would have different numbers of children in different settings. In a country with no gender gap in unemployment and a moderate 20-percent long-term unemployment rate (under the 30-percent average), around 82 percent of women would have become mothers by age 35. By contrast, in countries with a 10-point difference between female and male unemployment rates and a 60-percent long-term unemployment rate, only slightly over two-thirds of women would have had a child by age 35. Similar differences persist into the transition to a second child. The negative effect of persistent female unemployment is particularly large in the case of the third birth. Eight years after the birth of a second child, only one in four women will have had a third child in countries with hysteretic unemployment and a large gender unemployment gap. Once they become mothers, women are likely to plan for a two-child family, but under harsh economic conditions, very few venture into larger families.

The predicted proportions of women with one, two, and three children in each column of Table 2 combine to calculate a raw estimate of the total number of children for an average woman facing different labor-market conditions.³ Where male and female unemployment

rates are similar and joblessness is short-lived, fertility rates are around 1.81, close to the current rates of the Nordic countries and Ireland. However, when unemployment rates are particularly high for women and unemployment is highly persistent, the estimated fertility is only around 1.28, similar to that prevalent in Southern Europe. These simulations closely match the high and low ends of the distribution of fertility rates within Europe and their underlying labor-market conditions.

IV. Inadequate Labor-Market Institutions

The positive correlation between fertility rates and female participation shown in Figure 2 is a result of the way labor-market institutions jointly affect childbearing and participation decisions (Adsera, 2004). A low gender gap in unemployment and certain contractual arrangements create a favorable environment for combining family and work. Among those arrangements, an abundance of government jobs (tenured positions in Europe) provides strong incentives for women to transit faster to motherhood while remaining employed (Sherwin Rosen, 1996). Also, flexible labor legislation and widespread part-time employment facilitate the dual role of mother–worker (Adsera, 2005).

Not surprisingly, fertility behavior has changed most dramatically in nations with low (but rapidly growing) female participation where joblessness has been more prevalent and persistent—particularly among women. Strict regulations that favor traditional full-time male employment in these countries, notably in Southern Europe, hinder part-time employment

³ The measure could slightly over- or underestimate the ultimate fertility depending, for example, on the proportion of women who have more than three children.

availability (OECD, 1995).⁴ As women continue to enter the labor force, labor-market institutions need to be adapted to these new workers to minimize the trade-offs connected with childbearing in order to encourage fertility.

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⁴ In separate estimates I drop both unemployment measures in Table 2 and substitute the employment protection legislation index (EPL) from the OECD combined with information from the International Organization of Employers to extend the series to the early 1980s. The simulated number of children for a country with very flexible legislation (EPL = 0.5) and small share of government employment (15 percent) is around 1.72—closely matching the United Kingdom in 1995. In those with a moderate EPL of 2.3 but an extensive public sector (30 percent), predicted fertility is 1.71—similar to Sweden in 1995. In countries with tight labor markets (EPL = 4.1) and scarce government jobs it falls to 1.36—close to Southern Europe in the mid 1990s. Details are available from the author upon request.