

Comments on *The Future of American Fertility*  
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The paper by Preston and Sten takes on a formidable task: that of forecasting the future of American fertility. Predicting future responses in human behavior is never easy, and given the large swings in fertility behavior over the last century, fertility rates seem to often be the result of factors that are unobservable to researchers. However, the authors make progress in increasing our understanding of fertility responses to a set of demographic and economic factors, such as the role of ethnicity, educational attainment, and relative wages between men and women.

Figure 1 shows actual period total fertility rates that have been experienced since 1917, as well as predicted future period fertility rates under three alternate scenarios for projecting Social Security finances based on the 2004 Trustees Report. The figure shows that while fertility rates have been stable over the last few decades, previous fluctuations in fertility rates were much higher than the range of projected fertility rates under the three alternate scenarios. However, the impact of even these historically modest fluctuations in terms of Social Security projected finances is enormous: the difference between the 75-year actuarial deficit varying only the assumption on fertility from the high fertility (low cost) assumption to the low fertility (high cost) assumption is 0.70 percent of taxable payroll, or a present value of almost \$2 trillion. This amount represents approximately half of the current shortfall in projected Social Security benefits over this window. This fact highlights both the important role that fertility plays in pay-as-you-go programs such as Social Security, and the difficulty in predicting with any level of certainty what fertility rates will look like in the future.

The authors begin by cataloguing several factors that have been thought to influence fertility. Sociological determinants include the role of social expectations and norms related to the number of children a woman decides to have and the role of out-of-wedlock births, social rewards of parenting, and the ethnicity of the mother which may play a role in forming cultural attitudes towards children and values and practices related to childbearing. Technological determinants include factors that may reduce fertility levels, such as the advent of the birth control pill and abortion, and factors that may increase fertility levels, such as advances in medical treatments for adults who suffer from infertility. Lastly, economic factors that may influence fertility include educational attainment and earnings of both men and women, unemployment rates, and the value of owner-occupied housing.

There are two aspects of fertility that are important – timing and volume. Volume, in the context of period fertility rates, refers to the change in age-specific fertility rates which add up to the total fertility rate. A shift in the timing of births, by contrast, could have no effect on the total fertility rate. Figure 2 highlights the change in the mean age of mother at childbirth over the same period as Figure 1. During years of high fertility rates, the mean age of mother tends to be higher, but in recent years, there has been a trend of higher ages of childbearing without corresponding movements in underlying fertility rates. It is also interesting to note that while all three cost scenarios by Social Security predict a slight increase in the mean age of mother, the three scenarios do not differ from one another in this regard.

The authors discuss several empirical facts about fertility in the United States and how it relates to international fertility levels. A large factor in the reduction in the total fertility rates after 1976 is the shift from families with 4 or more children to families with 2 children, while the increase in families with 0 or 1 child was small. More than a third of births in 2005 were out-of-

wedlock, representing a large shift compared to 1960 and deemphasizing the role of marriage in explaining fertility outcomes. While it is commonly argued that high levels of Hispanic immigration account for the U.S.'s relatively high fertility rates, the total fertility rate of non-Hispanic whites in the U.S. is still high by international standards. Social norms likely play a role in explaining differences in international fertility levels, such as traditional mindsets that discourage mothers from working and unmarried women from having children. Americans are more religious than Europeans, and within the U.S., church attendance is positively correlated with fertility (though the effects may be at least partially attributable to self-selection).

The main results of the Preston and Sten paper relate to the association of three particular factors with fertility rates, and the predicted influences of these three factors on future fertility. The three factors examined are: the correlation between female education and fertility; fertility levels by ethnicity; and the association of female and male earnings with fertility levels. The authors use variation over time and geographic area to estimate the responses and find that the magnitude of the correlation between fertility and female education has declined, the differential between Hispanic and non-Hispanic white fertility has widened, and higher female earnings are associated with lower fertility, while the opposite is true for male earnings.

To predict what will happen in the future, the authors forecast how these three components will change and use their results to predict what fertility will look like. Higher predicted female education levels are predicted to lead to slightly lower fertility, changes in ethnicity are predicted to have the opposite effect, and increases in relative female earnings are predicted to have a potentially large negative effect on fertility.

The authors acknowledge several caveats in interpreting these as causal determinants of fertility. Perhaps the largest confounding factor in regressions that use geographic variation as a

source of identification is selective migration. Unobservable factors such as tastes for work and childbearing may influence where a woman chooses to locate. In addition, reverse causation is also a concern: geographic characteristics that may depress fertility rates (for instance, high costs of housing) may cause women to make larger investments in human capital, thus raising their earnings. Exogenous shifts in earnings levels are difficult to isolate. One place to look in future studies of female earnings and fertility levels may be variation in after-tax earnings over time, across states, and across households.

Another issue in interpreting the authors' results as a causal effect of earnings on fertility is mismatch between the timing of the fertility decision and the value of the covariates. If there was a large change in relative female earnings from the time when women made their fertility decisions and the time of the survey, the results of this analysis will be biased. A similar point could be made about other covariates which may change within a geographic area over time, such as unemployment, housing prices, and male income.

In their analysis, the authors use median earnings of full-time, full-year female workers as a proxy for market opportunities for women. However, it is possible that two geographic areas with the same level of median earnings among full-time and full-year workers may differ in the underlying reservation wage of the female population in that area if they have very different levels of female labor force participation. It is unclear whether omitting the female labor force participation rate would dramatically affect their results, and including this covariate would introduce similar identification problems as discussed above such as simultaneous causation and mismatch of timing.

The authors estimate the effects of female education, ethnicity, and earnings separately, but it is possible that there is an interaction effect of these three factors. Do highly educated

individuals respond more to relative wages than women with low levels of education? Do ethnic groups respond differently to relative wages? The answers to these questions would provide a larger picture of how these three factors relate to fertility behavior.

As the authors state, the association between education and fertility behavior has changed from decade to decade. This fact highlights the difficulty of using their estimates to predict future fertility levels if this association may change in the future. Similarly, there is reason to believe that future generations of Hispanic immigrants will not share the same high fertility rates as their ancestors.

The evidence presented in the paper is inconclusive about the effects of housing prices on fertility. The authors find that a higher median price of owner-occupied houses is associated with higher fertility, against their intuition that higher housing prices should increase the cost of having additional children due to larger space requirements. This result is puzzling, but the authors state that this may be due to a wealth effect: wealthier individuals can afford to live in more expensive houses and have more children. Further investigation into this question would be an interesting area for future research, particularly with recent fluctuations in home prices over time which may serve as an additional source of identification.

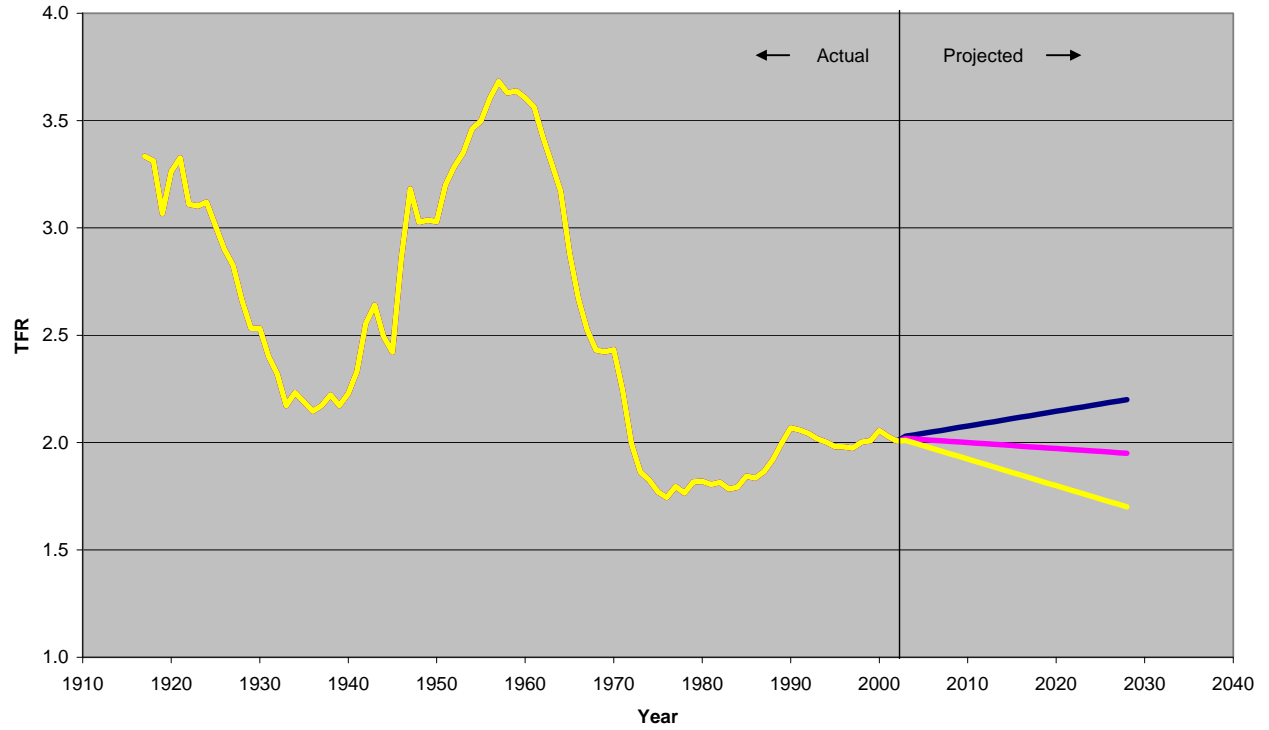
The authors mainly focus on volume rather than the timing of births. However, each has different implications for programs like Social Security. Because Social Security financing largely depends on the ratio of young workers to retirees, changes in timing of births have a transitional effect, but no long-run effect on the old-age dependency ratio (once the first delayed generation grows to be in the old age category). By contrast, as mentioned earlier, changes in volume can have large effects on Social Security financing. Figure 3 simulates the old-age dependency ratio under two scenarios: one is simply the intermediate scenario as defined by

Social Security, and the other has the same underlying total fertility rate, but adjusts the timing of births to change according to past changes in timing. The old-age dependency ratio is defined as the ratio of the number of people age 65 and older to the number of people age 20-64. Note the delay-adjusted old-age dependency ratio is higher than the old-age dependency ratio, but that the difference between the two ratios decreases once the population has matured.

Overall, the Preston and Sten paper provides an interesting look at many factors that influence fertility. The analysis highlights the difficulties in predicting characteristics of future fertility, and outlines several problems with isolating exogenous factors that influence fertility behavior.

**Figure 1**

**Actual and Projected Period Total Fertility Rates  
Social Security Administration Cost Scenarios**



**Figure 2**

**Mean Age of Mother at Childbirth  
Social Security Administration Cost Scenarios**

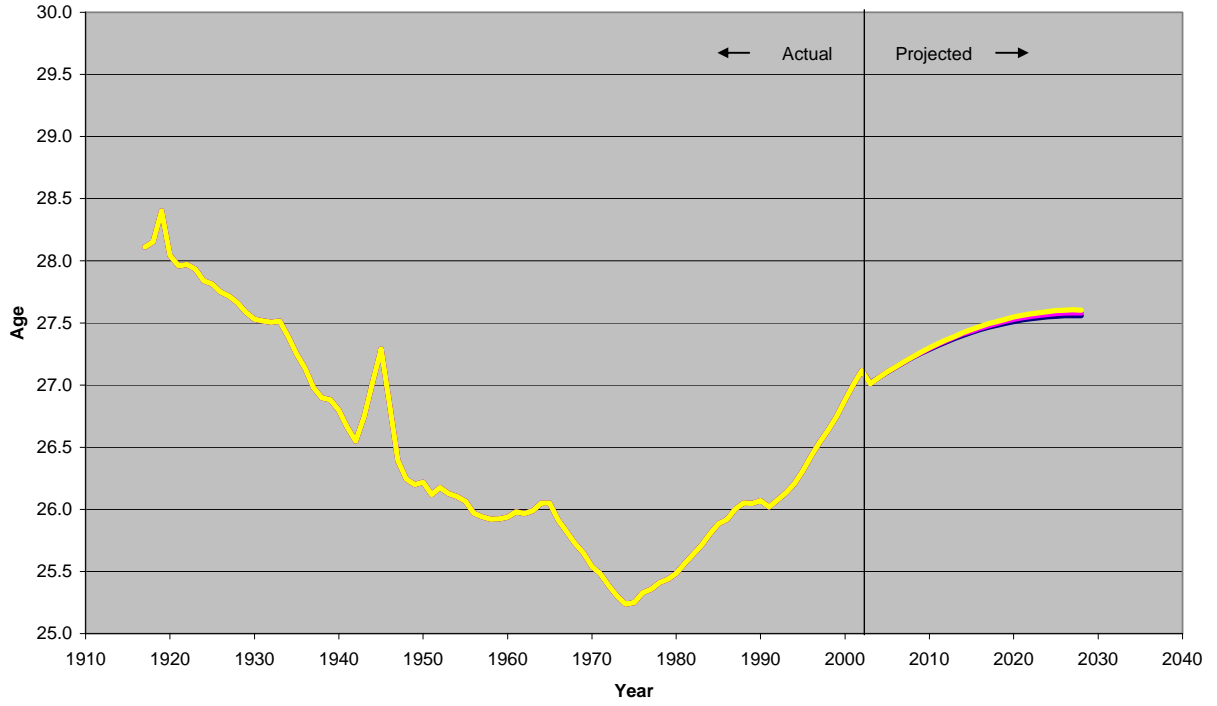




Figure 3

### Projected Old-Age Dependency Ratios

