Understanding the Fertility-Economy Link for Teenagers

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The 1990s and early 2000s have seen major changes in both the economy and fertility patterns. For the economy, there was a long and robust economic expansion, with especially large economic gains for minorities and teenagers, followed by a lingering recession. For fertility, this period has seen large declines in fertility through the decade for both 15–17 (see Figure 1) and 18–19-year-olds (see Figure 2), with even larger declines among black teenagers. Consistent with these trends in teenage fertility, the rate of sexual activity has declined through the 1990s, while the use of contraception has increased, both to an increasing degree for black relative to white teenagers.
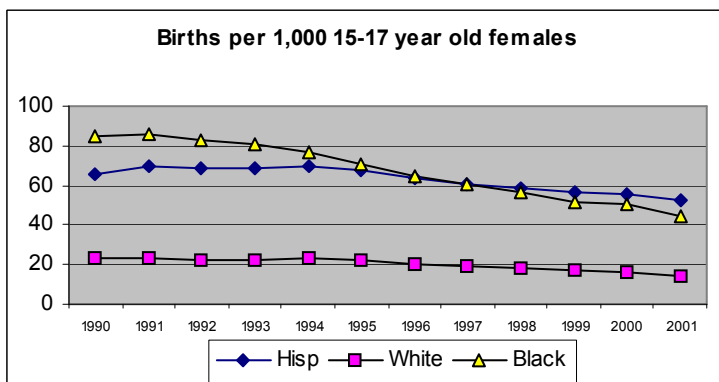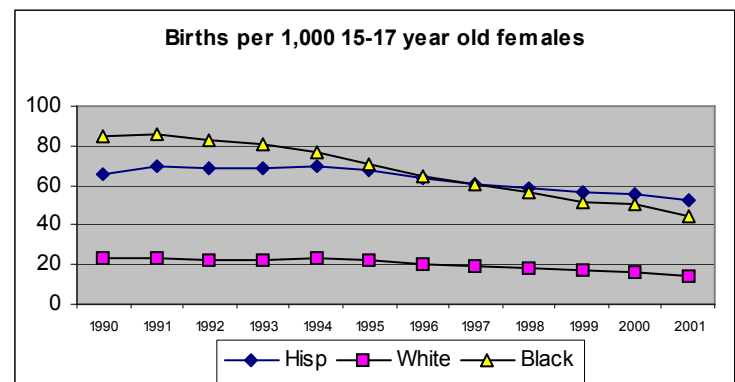
Figure 1	**Figure 2**

These nearly simultaneous and large changes in fertility-related outcomes and the economy suggest the possibility of a causal pathway from the economy to fertility. That is, for teenagers, a stronger economy—more job opportunities and higher wages—makes time off to raise children more valuable, depressing fertility and perhaps the factors directly leading to fertility; in more formal economic terms, the substitution effect outweighs the income effect. This would be in contrast to existing studies, which appear to find positive effects of the economy on fertility at all ages—teenagers and adults (Levine, 2002; Matthews et al., 1997). There are alternative explanations to those from the income and substitution effects. One could argue that teenagers are busier with a stronger economy, so that they have less time for dating and sexual relationships. In addition, it is possible that, with a stronger economy, female teenagers have more female role models who are working and fewer on welfare. This could help foster a sense of an economic future that would make teenage childbearing more costly.

This project aims to improve our understanding of the connection between the economy, the proximate determinants of fertility (i.e., the factors that directly contribute to fertility), and fertility itself for teenagers. Using individual-level behavior data from the National Longitudinal Survey of Youth-1997 (NLSY-97), we will:

(1) Estimate how the economy affects the fertility of teenagers and its proximate determinants: the rates of sexual activity, contraception use, pregnancy, abortions, and fertility itself;

(2) Examine whether there are differences in these effects across racial-ethnic groups and family backgrounds (e.g., divorced parents, poverty status);

(3) Use a proximate determinants framework to decompose the changes in the teenage fertility from changes in the economy into changes at each proximate determinant.

The NLSY97 data available to this project will cover the period 1997 to 2002, spanning the end of the major expansion and the recession that followed. The fertility-related outcomes will be:

- Sexual activity: Number of times the respondent had sex in the last year (annualized for questions on "since the last interview");
- Contraception:
  - Number of times the respondent had sex without contraception in the last year (annualized);
  - Percent of time the respondent used contraception, among those who had any sex;
- Pregnancies: Whether the respondent became pregnant since the last interview;
- Abortions: Whether the respondent had an abortion since the last interview;
- Births: Whether the respondent had a live birth since the last interview.

Our key independent variable—the economy—varies across geographic areas (here, states), so we can apply difference-of-difference methods to control non-parametrically for state of residence and time, which will factor-out generic influences on teenage fertility-related outcomes. The resulting estimates will indicate whether within-state changes in the economy led to within-state changes in the proximate determinants of fertility and, through those proximate determinants, to changes in fertility itself. We will use the resulting estimates to interpret the changes in teenage fertility since the early 1990s. To what extent does the economy explain the overall declines? To what extent does the economy explain the relative decline across racial/ethnic groups?

Besides using more current data, this analysis will make another contribution over previous related work: We will use more appropriate economic variables. The economic variables used in previous analyses (Matthews et al., 1997; Levine, 2001; and Levine, 2002) are narrowly defined employment measures. For example, Levine (2001), who uses a methodology most similar to what we propose, uses the state teenage employment-population ratio. These narrowly defined economic variables are calculated from national survey data and are based on a limited number of observations, which could cause sampling error, especially for smaller states. This, in turn, could cause attenuation bias in the estimates of the effects of the economy on the fertility outcomes, which usually biases the coefficient estimates toward zero. In addition, the narrowly defined economic variables may be endogenous in that exogenous fertility shocks could affect the employment variable—e.g., an exogenous increase in teenage fertility could cause fewer females to work. Our first economic variable is the overall state unemployment rate, which is much less subject to sampling error bias and less subject to exogenous fertility shocks because the variable represents all workers in a state. We will also use an alternative economic measure, suggested by Bartik (1991), that measures the economic growth rate in a state by multiplying the percentage of workers in the state who are in each industry by the national output growth rate for each industry. This should be purely exogenous to teenage fertility-related behavior.

Finally, we will perform simulations to determine how much the rates of sexual activity, lack of contraception, pregnancies, abortions, and birth rates changed for teenagers in the 1990s as a result of the economic changes.

Table 1 presents some preliminary findings for a sample of 15 to 18 year old females. By the time of the presentation, the analysis will be augmented by another year's data, a more detailed analysis on the timing of births, more state economic variables, a breakdown by race/ethnicity, and more appropriate econometric models. The first three outcomes are dichotomous outcomes, the fourth is a percent, and the last two are positive integers. These models call for nonlinear probability and Tobit models. Nevertheless, for the preliminary models here, we just use linear probability models and ordinary least squares. The models include state and year fixed effects, as well as several variables representing family background.

The preliminary results suggest that, when the economy is weaker (unemployment rate is higher) teenage females are less likely to use contraception and slightly more likely to get pregnant.

Table 1. Results from preliminary models for females, age 15-18.

	Coefficient estimate on the state unemployment rate
Had a birth since the last interview	0.003 (0.004)
Became pregnant since the last interview	0.009* (0.005)
Had an abortion since the last interview	0.000 (0.003)
Percent of sexual encounters used birth control (among those who had any sex)	-0.036** (0.014)
Number of times had sex without contraception	1.192 (1.475)
Number of times had sex	1.307 (2.517)

Note:
Standard errors are in parentheses.
** indicates statistical significance at the 5-percent level.
* indicates statistical significance at the 10-percent level.