The Great Recession, Job Loss, and Fertility: Evidence from North Carolina

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Long Abstract

If history is to serve as a guide, then the recent economic crisis, the so-called Great Recession, may lead to a decrease in the American birth rate. The Great Depression, to which the recent economic recession has often been compared, is believed to have depressed fertility (Rindfuss, Morgan and Swicegood 1988; Fishback, Haines and Kantor 2007). Though the recent economic crisis did not approach the severity of the Great Depression, preliminary indicators suggest that it also decreased the birth rate. When compared to 2007, the American birth rate in 2010 had decreased from 69.5 to 64.7 per 1000 women; this translates into 315,500 fewer babies born in 2010 relative to 2007 (Sutton and Hamilton 2011). This decline represents the biggest multiyear decrease in births seen in the past 30 years (Sutton, Hamilton and Mathews 2011).

One of the key features of the Great Recession was job loss, which could explain why fertility rates declined. This study investigates the relationship between job loss and fertility by asking the following questions. First, how does community-wide job loss impact on the birth rate? Second, does job loss experienced during the Great Recession (GR) have different impacts than job loss experienced at other times? Third, do the associations between job loss and fertility vary by women's marital status and level of education?

Establishing a causal impact of community-wide job loss on fertility can be difficult, as cross-sectional correlations between local employment rates and fertility are likely to reflect omitted variable bias (e.g., a poor local educational system may affect both employment and fertility) and reverse causality (e.g., a pro-natalist local trend may cause a decrease in employment). To address the potentially endogenous nature of unemployment rates to fertility, this study instead utilizes measure of sudden increases in forced separations from employment. These forced separations, as shown in previous studies and confirmed in our own tests, appear to typically occur because of changes in local circumstances that are unrelated to changes in the characteristics of the workers (e.g. increased pressure from globalization). Such job losses are considered exogenous "shocks" to the workers (Jacobson, LaLonde and Sullivan 1993; Stevens 1997) and allow us to estimate the causal effect of job loss on fertility rates.

Our study makes several contributions to the literature, building on recent work that uses a similar analytic strategy to investigate the relationship between job loss and fertility (Amialchuck 2008; Lindo 2010). First, this is the first study of which we are aware to compare the effects of community-wide job loss experienced during the GR to community-wide job loss experienced at other times. GR job loss might have had larger effects on fertility because of its

severe and pervasive nature; those who remained employed during the GR might nevertheless have changed their fertility behavior because of general feelings of economic unease and insecurity. Second, our study is the first to utilize monthly, rather than yearly or quarterly, rates of job loss and births. Monthly data are critical because they allow us to calculate the elapsed time between the month of job losses and the month of birth and thereby permit us to separately distinguish changes in the birth rate that come through either the termination of existing pregnancies or through contraception efforts. Third, because of the richness of our data, we are able to provide estimates separately by maternal marital status and education. Our results demonstrate that both factors influence the magnitude and the direction of the association between community-wide job loss and fertility rates.

Method

Data

Birth data come from the North Carolina Detailed Birth Record Database (NCDBR) compiles questionnaires obtained at the time of birth certificate filing for all live births in the state. The NCDBR contains maternal demographic information, including age, race, and residence at time of delivery. It also provides the exact date of birth and gestational age at birth, allowing us to identify the timing of conception. Our sample includes births that occurred to women who were between the ages of 20 and 39 and resided in NC, totaling 2,148,119 births that were conceived between April of 1990 and April of 2009 (this span corresponds to the range when we can observe job losses three months prior to the conception, e.g., no earlier than January of 1990, and nine months after conception, e.g., no later than December of 2009). We generate county-level monthly birthrates that serve as the dependent variables in our analysis. We index birthrates by the month they were conceived, rather than the month of delivery, since pre-pregnancy and early pregnancy are the relevant time periods for women to make fertility decisions. We calculate birthrates to married and unmarried women, divided by educational attainment (a high school degree or less, some college, and a Bachelor's degree or more). Birthrates for each county-month are calculated, for each subgroup, as the number of births conceived that month in that county to women in that marital status and education group per 1,000 women in that marital status and education group in that county as measured in the 1990 U.S. Census. We fix the denominator over time because county-level annual estimates of subgroup populations can be unstable, which could result in volatility in our birthrate measures

The independent variable of interest, community-wide job loss, was obtained from the NC Employment Security Commission, which provides monthly information on any business that shuts down or lays off workers. Based on this information, we have constructed, for all 100 counties and for the years 1990-2009, a database that includes the company name, industry, and number of workers terminated, and from that have determined the total jobs lost in each county

in each month. When matched with the NCDBR, the resulting dataset has 22,800 county-month-year records. Importantly, the data include the date the closing or layoff was announced (by convention, and in many cases by legal requirement, closings or layoffs should be announced 60 days prior to the actual event). Thus, we are measuring the effect of a change in information about the local economy, and not the actual job losses themselves; we hypothesize that women will react to economic news, not to the delayed implications of that news. Using announcement dates also strengthens our ability to make a causal estimate. We conduct additional tests to see if fertility behaviors change prior to the announcement (if, for example, community residents heard rumors prior to the job loss announcement and women altered their fertility behaviors in response); results (not shown) suggest that they do not. We scale total job losses in the county each month by the 1990 working-age (age 16-64) population in that county.

Though data are limited to one state, results from our study are potentially generalizable to other locations. The tenth most populous state in the US, with more than nine million residents, North Carolina has a diverse population living in both rural and urban settings. Additionally, North Carolina has experienced significant ongoing job losses due to pressures from globalization that began well before this most recent economic downturn; the types of job lost in North Carolina, primarily in the manufacturing and service sectors, mirror similar losses around the country. North Carolina also has a birth rate and non-marital fertility rate that track closely with the US as a whole. Moreover, it is important to note that North Carolina is the only US state that provides data on gross job losses by industry for each county in the state. No other state does so even on a much less fine basis (such as annually, or at the level of the entire state). Thus, North Carolina is the only state in which an analysis such as this can be conducted that uses local monthly variation in job losses to understand time-sensitive local phenomena such as birth rates.

Analytic plan

To model the effect of community job loss on birthrates, we use ordinary least squares regressions, in which we estimate the effect of the number of recently-announced jobs lost in a given county in a given month on the subsequent birthrates for women in that county. Job loss announcements are measured relative to pregnancies that are at two different stages. First, we examine the effects of job loss on pregnancies that already exist and are 0-4 months post-conception, whose manifestation as births can be affected by abortion behavior but not contraception. Second, we examine effects on pregnancies that may occur in the next 1 to 3 months, whose translation to births could be affected by changes in the conception rate (due to changes in contraception) and/or by decisions about abortion made after conception occurs. We also include a dichotomous indicator for whether the conception occurred during the GR (between December of 2007 and June of 2009), and an interaction term between community-wide job loss (measured at either 0-4 months post conception or 1-3 months pre-conception) and

the GR indicator. A significant coefficient on the GR indicator indicates that women altered their fertility during the GR because of factors unrelated to community-wide job loss itself. A significant coefficient on the interaction term between GR and job loss indicates that job loss experienced during the months of the GR had a different impact than job loss experienced during other time periods.

All models include dichotomous indicators for county of residence, month of conception, year of conception, and county over-time trends. The fixed effects for county, month, and year, and the county time trends are important to include because they let us control for persistent differences between counties, for seasonality of conception, for any event that may have affected all counties in the state that year, and for different over-time trends within each county, respectively. Using this approach means that our estimates isolate the effect of job losses that are "shocks" to a county, relative to the overall economy in the state each year and relative to the county's own gradually evolving labor market. Likewise, our estimates isolate birthrate "jumps" in a county, relative to overall birthrates for that demographic group in the state that year and relative to the county's own gradually evolving birthrate for that demographic group. We then measure the relationship of job loss shocks to jumps in the rate of births conceived around that time in order to identify the effects of job losses on fertility. Heteroskedasticity-robust standard errors are clustered at the county level to allow for non-independence of observations.

Results

Results are presented in Table 1. To facilitate comparisons of the effects of job loss on subgroups with different underlying birth rates, coefficients are expressed as the percent change in the birth rate arising from a job loss to 1% of a county's working age population. For each subgroup (e.g., unmarried, high school or less) three coefficients are presented: a main effect of the Great Recession (e.g., having a conception that occurred between December of 2007 and June of 2009), a main effect of community-wide job loss (occurring either 0 to 4 months after conception, or 1 to 3 months before a conception), and an interaction between GR and job loss.

The results suggest that effects of the GR and job loss varied by marital status and educational attainment. Unmarried women with a high school diploma or less increased their fertility in response to job losses in their communities 1-3 months prior to conception (column 2). These effects did not vary if job loss was experienced during the GR, and the GR itself did not have an effect on their fertility. Among married women with a high school diploma or less, fertility decreased in response to community-wide job losses occurring 0-4 months after conception, but only if those job losses occurred during the GR. There was no main effect of job loss for this group, and like their unmarried counterparts, they did not change their fertility in response to the GR. Results for unmarried women with some college mirrored those of married women with a high school diploma or less: a decrease in the birth rate in response to community-

wide job losses experienced 0-4 months after conception during the GR. Finally, married women with some college or a college degree decreased their fertility in response to the GR, but did not change their fertility in response to job loss or job loss experienced during the GR.[1]

To address concerns that our findings could represent a spurious correlation between job loss and fertility rates, we estimated the effect of job losses that occurred 6 to 9 months after conception on the share of those conceptions realized as births. In the third trimester, a woman can do little to affect the outcome of her current pregnancy. We would therefore expect there to be no significant association between job loss over this period of pregnancy and birthrates. Results indicate no significant relationships, and generally small point estimates. We infer from these findings that results presented earlier are not driven by spurious factors, as such factors would be unlikely to drive results solely within the narrow time frame on which our method focuses. These findings also provide reassurance that job loss announcements are unanticipated; if information about upcoming job losses typically leaked prior to announcement, then women would have been able to respond to the news prior to their third trimester. Finally, these results demonstrate that job loss announcements do not change the fetal death rate in late pregnancy, which makes the possibility that they impact miscarriage earlier in pregnancy less plausible.

Discussion

Our results show that community-wide job losses affect the fertility rate, especially during the Great Recession, although effects varied by women's marital status and level of education. Unmarried women with a high school diploma or less appear to perceive a period of forced separation from employment as an opportune time to have a child, presumably because the opportunity costs of having a child are low. This group may have a hard time establishing a firm foothold in the labor market during the best of economic times, and therefore may not perceive that job loss during the GR as different from job loss occurring at other times. For married women with a high school degree or less and single women with some college (two groups whose attachments to the labor force likely differ from unmarried women with low levels of education), community-wide job losses that occurred after a child had been conceived likely increased the cost of a child, and the economic malaise associated with the GR may have heightened the uncertainty about being able to afford that child. Women in those groups appeared to have responded by increasing their termination behaviors. Among married women with at least some college education, the GR, but not job loss itself, was associated with a reduction in fertility. This suggests that the ripple effects of the GR, including declining housing prices and decreases in the stock markets (two factors which may have been felt most acutely by better educated mothers), may have led to a decrease in fertility.

[1] In results not shown, we also test whether the recessions of the early 1990s and 2000s were associated with a differential effect of job loss. These interaction terms were not significant, nor was there any main effect of the 1990s or 2000s recession.

References

Amialchuck, A. (2008). The Effect of Husband's Earnings Shocks on the Timing of Fertility. University of Houston.

Fishback, P. V., M. R. Haines and S. Kantor (2007). "Births, Deaths, and New Deal Relief During the Great Depression." Review of Economics and Statistics 89: 1-14.

Jacobson, L. S., R. J. LaLonde and D. G. Sullivan (1993). "Earnings Losses of Displaced Workers." American Economic Review 83: 685-709.

Lindo, J. M. (2010). "Are Children Really Inferior Goods? Evidence from Displacement-Driven Income Shocks." Journal of Human Resources 45: 301-327.

Rindfuss, R. R., S. P. Morgan and G. Swicegood (1988). First Births in America: Changes in the Timing of Parenthood. Berkeley, University of California Press.

Stevens, A. H. (1997). "Persistent Effects of Job Displacement: The Importance of Multiple Job Losses." Journal of Labor Economics 15: 165–188.

Sutton, P. D. and B. E. Hamilton (2011). Recent Trends in Births and Fertility Rates through 2010. NCHS Health E-stats. National Center for Health Statistics, Hyattsville, MD.

Sutton, P. D., B. E. Hamilton and T. J. Mathews (2011). Recent Decline in Births in the United States, 2007–2009. NCHS data brief, no 60. Hyattsville, MD, National Center for Health Statistics. .