

Did the Great Recession Affect Fertility? Examining the Impact of Job Displacements on the Timing of Births in the U.S.

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Abstract

We examine the impact of job losses during the Great Recession on fertility in the United States. We find that for married/cohabiting couples, job losses of males during the recession decreased the likelihood of birth. In contrast, job losses of married/cohabiting females had no impact, on average, on fertility because of opposing age-specific effects. While younger women were reducing fertility after job losses to cope with the loss of income, older women, aged 40 and above, were more likely to have a child following their job loss. Moreover, we find that job losses of single/non-cohabiting females decreased the likelihood of birth, particularly for women below the age of 25. This negative effect on fertility persisted in the medium-term, up to three years following the job losses. Overall, these results suggest that job losses during the recession may be partly responsible for the recent decline in the U.S. birth rates.

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1. Introduction

The Great Recession in the United States is the longest recession in the post-World War II era, lasting from December 2007 to June 2009. It had enormous impacts on the U.S. economy as output decreased by 4% and 8.7 million jobs were lost (Labonte 2010; Bureau of Labor Statistics 2014). Since its start, the unemployment rate rose from 4.7% to its peak of 10% in 2009 (Bureau of Labor Statistics 2016). Also, since 2007, the United States experienced a decline in overall fertility rate (Comolli and Bernardi 2015; National Center for Health Statistics (NCHS) 2017).¹ This raises the question of whether this recession is responsible for the recent U.S. fertility decline.

It is critical to answer this question for several reasons. First, it is important to learn if couples are spacing or reducing births as a strategy to cope with the effects of the recession, which consequently reduces the fertility rate (Cinnirela, Klemp, and Weisdorf 2017). Second, if the recession did affect fertility outcomes, there are important implications for the future labor market and population outcomes in the United States. Third, there is a large literature on the impact of past economic downturns on fertility (Sobotka, Skirbekk, and Philipov 2011).² However, the scope and length of the Great Recession are larger and longer than the typically studied downturn (National Bureau of Economic Research 2018), and therefore, its effect can be different from the previously studied shocks. Finally, fertility choices have crucial effects on a mother's health, and our understanding of the determinants of the choices is vital. Despite its importance, there has only been limited research on this topic. One cause of the U.S. fertility

¹ There was a tiny increase in birth rates in 2014, which was followed by a decrease in 2015 (NCHS 2014, 2015).

² For a comprehensive review of the literature on economic downturns and fertility, see Sobotka, Skirbekk, and Philipov (2011).

decline may be the reduction in the housing wealth of homeowners during the recession, as shown by Lovenheim and Mumford (2013). Another cause may be job displacements/losses. Therefore, the goal of our study is to examine the impact of job displacements during the Great Recession on fertility in the United States.

Several studies find that a loss of real income through shocks, such as unemployment (Mocan 1990; Adsera 2004; Bono, Weber, and Winter-Ebmer 2012; Currie and Schwandt 2014), economic downturn (Palloni, Hill, and Aguirre 1996; Adsera and Menendez 2009; Sobotka, Skirbekk, and Philipov 2011), increase in food prices (Bengtsson and Dribe 2006), and crop loss (Alam and Portner 2018), can decrease fertility. This is because households space births to cope with the effect of a sudden loss of income as children are costly in the short-term. In contrast to these studies, Lindo (2010) finds that male job losses in the United States increase short-term fertility as it reduces the individuals' future earnings growth, which consequently reduces any incentive to delay childbearing. Lindo further finds that households are less likely to have children in the long run leading to a net reduction in total fertility in the long run.³

In addition to the income effect, job losses can also have differing effects on fertility based on gender and changes in the opportunity cost of time. Schultz (1985) and Schaller (2016) find an inverse relationship between the opportunity cost of a woman's time and fertility.⁴ This suggests that when a woman becomes unemployed, her opportunity cost of time decreases, and

³ As enough time has not passed since the occurrence of the Great Recession to examine its long-term effect, we limit our study to short-term and medium-term effects of the recession on fertility.

⁴ Schultz (1985) provides evidence that an increase in women's value of time relative to men's time led to a decrease in fertility in Sweden during the period 1736 to 1946. Similarly, Schaller (2016) finds that an improvement in women's labor market conditions reduces fertility.

consequently, she may decide to have a child during the period of unemployment. In contrast, Huttunen and Kellokumpu (2016) use data from Finland to show that while a male loss of income does not affect fertility, job loss for highly educated women decreases fertility because of longer-term career concerns. Given the different results of the impact of job loss on short-term fertility in prior studies, it is not clear how job losses during the most recent recession may have affected fertility. It is also important to note that as the chances of being re-employed quickly after a job loss were likely to have been significantly lower during this recession, given its magnitude and scope, relative to ordinary economic conditions, the effect of job losses during the Great Recession can be different than the ones examined in prior studies.

Only a handful of studies (Schneider 2015; Schneider and Hastings 2015; Muz 2017) examine the impact of increased unemployment in the United States during the Great Recession on fertility. However, these studies have several data limitations, primarily because they use aggregated data. For example, Schneider (2015) and Muz (2017) use aggregated area level conditions, such as the annual state or county unemployment rate, as independent variables and the aggregate area level fertility rate as the outcome variable. There are three limitations arising from the use of such a technique. First, it is not possible to interpret the findings using such aggregate data. It is unclear from the studies whether job displacement of an individual itself affects their fertility or whether the high unemployment in an area causes employed people to be fearful of future job loss and to consequently postpone conceptions and births, which then decreases the fertility rate. Second, it is not possible to identify the exact timing (month) of the job loss and the timing of birth when using annual data. As the job displacements and births could have happened at any point in those (annual) time ranges, the degree of measurement error

is likely high for such estimations.⁵ Third, these studies are unable to examine the channels through which fertility is affected (income effect vs. opportunity cost of mother's time) or to separate the differential effects of job loss by gender, age, marital status, and income. As their focus on overall fertility may mask important heterogeneity, they do not provide the complete picture of the effect on fertility. Schneider and Hastings (2015) also use state level economic conditions which make them prone to the same limitations. Although they use individual level data for fertility, the cross-sectional nature of the data does not allow them to control for potential endogeneity associated with job losses, household socioeconomic status, and fertility. Moreover, they only study non-marital fertility. Lastly, all three studies only examine the short-term impact of the recession on fertility, i.e., fertility within a year of job displacement.

In our study, we address these issues by using detailed individual level panel data, including monthly job loss and fertility history, and employing an individual fixed effects model. We find that for couples who are married or cohabiting, only job displacements of males during the recession led to a decline in the likelihood of childbirth. This suggests that households were postponing conceptions/spacing births to cope with the loss of jobs. We find no positive rebound in fertility within the four years following the job losses during the recession, which suggests that the job losses are having a longer-term negative effect on fertility. We also find important

⁵ Muz (2017) examines the impact of quarterly state unemployment on fertility rate four quarters later. While this decreases the measurement error for unemployment, this increases the measurement error for fertility. This is because the author is examining the impact on conceptions only three months following the shock. However, many households may not change their fertility decisions immediately following a shock, because it is too early for them to know whether the loss of income will persist. Instead, they are likely to search for another job and use their savings/borrowing to cope immediately after the shock.

heterogeneity in effects by income, age, and gender. In contrast to males, job loss for married/cohabiting females had no impact, on average, on births. This is because there were opposing age-specific effects on fertility – while younger women were spacing births after a job loss to cope with the loss of income, older women, ages 40 and above, were more likely to have a child following their own job loss. Due to a shorter remaining period of fecundity, older women wanting a child are less likely to space births. As the chances of being re-employed quickly after a job loss are significantly lower during the recession, a period of unemployment provides her the window to conceive since the opportunity cost of her time is low. Furthermore, we find evidence that lower-income households are more likely to space or reduce births following job losses compared to higher-income households. This suggests that as these lower-income households may have lesser savings or wealth that can act as a buffer, they space or reduce births to cope with the effects of job loss.

We observe a different effect for females who are single or are not cohabiting with a partner: their own job displacement led to a decline in the likelihood of birth, particularly for women below the age of 25. Unlike married households, these job losses cause a sustained decline in fertility up to three years following the loss of jobs. While this study is not able to examine the effect on the lifetime total fertility of women because enough time has not passed since the end of the recession, the persistent negative effect on fertility even in the medium-term suggests that job displacements are at least partly responsible for driving the longer-term decline in fertility for single women that has been observed in macro level data by other studies (Astone, Martin, and Peters 2015).

This study makes several important contributions to the scant literature on fertility impacts of the recession. First, this is the first study, in our knowledge, that employs individual or

household level longitudinal data to examine the impact of job losses during the Great Recession on fertility. Detailed individual level data allows us to match the timing of the key variables, month and year of both job loss and fertility. Thus, in contrast to prior studies, we can precisely identify the effect of a specific case of individual job loss on birth. The use of panel data also helps our identification. While we are able to exploit the unanticipated nature of this recession, many of the job losses are likely not random. Hence, we use individual fixed effects to control for time-invariant factors that may bias the results, including unobservables that may affect both the job loss and fertility.

Second, in contrast to prior studies, detailed individual level data allows us to examine the channels through which job losses during the recession affects fertility, i.e., whether the job losses affect fertility through the loss of income or through the changing opportunity cost of time of mothers. Third, while prior studies have examined the longer-term effect of unemployment on fertility (Currie and Schwandt 2014), this is the first study to examine the medium-term impact of U.S. job losses specifically during the Great Recession on fertility, i.e., up to four years following the job losses during the recession. This is particularly important because it can help us understand whether job losses during the recession are partly responsible for the decline in the U.S. fertility since 2007, as well as understand the persistence of such effects of the recession. Fourth, detailed individual level data also enables us to examine important heterogeneity in the effects. For example, we find differences in effects by gender, marital status, age, and income of household members. All these allow us to comprehensively understand the different ways in which the job losses affected fertility.

It is worth noting that while individual fixed effects control for time-invariant factors, it does not control for other potential time-varying factors that may affect both job loss and

fertility. These factors can include changes in homeownership status, home valuations, amount of rent paid, health status, health problems, and occurrences of divorces or separation.

Employing detailed data, we are able to do a series of robustness checks that show that these factors do not bias the results.

The paper proceeds as follows: we describe the data in Section 2 followed by summary statistics and a description of the empirical methodology in Sections 3 and 4, respectively. Section 5 presents the results and a detailed discussion of the results. The study concludes with a summary and implications of our findings in Section 6.

2. Overview of the Data

Description of the Survey

The data used in this paper comes from the Panel Study of Income Dynamics (PSID). This survey was conducted annually from 1968 through 1997 and biennially thereafter. The PSID is a nationally representative survey using the 1968 U.S. population with an additional oversampling of low-income households. Over the decades, PSID has continuously tracked these individuals and their children. As members of original households grow up, move out, and form their own economically independent households (split-offs), they are interviewed separately, increasing the overall number of interviews conducted in each wave.

As we are primarily interested in the effects of the Great Recession, we use the PSID survey rounds from 2003 to 2013 for our analysis. We employ job loss data from the 2005 to 2013 rounds, and we use data for control variables from the immediate prior survey rounds (so that they are prior to job loss and are not affected by the job loss variable), i.e., 2003 to 2011

rounds. We use the 2003 round as the data cut-off point because there was a recession in the United States in 2001 that may bias the variables in the 2001 round.

Fertility History

We use detailed fertility data in our analysis which comes from the PSID's Childbirth and Adoption History File. This is a supplemental file of the PSID that covers all female members of the households aged 12-44 at the time of the interview. These individuals are asked retrospective questions about their adoption and birth histories, including the month and year of birth, of all their children at the time of their first interview. These histories are updated in each succeeding survey rounds. Therefore, we are able to access total fertility history for all eligible females in the sample until the year 2014. As our analysis should focus on individuals who are fertile, i.e., have the ability to give birth, we focus on the fertility of females aged 15 to 44. The units of analysis in this study are married and single women aged 15 to 44 during the years of the surveys. This brings our final sample to 2,235 married women and 1,239 single women.

Employment History

The PSID is particularly suited for this study because of its detailed information on employment. In each survey round, PSID asks questions on employment of the male and female heads of the household, who are typically the oldest couple or single member of the household.⁶ For unmarried couples, the employment data is collected for couples living together for at least

⁶ For married and/or cohabiting couples, PSID calls the male head as the "head" of the household and the female head as the "wife". For a single or non-cohabiting female who is the head of the household, PSID calls her the "head." To ensure clarity and to avoid confusion on terminology, instead of using the terminology of "head" and "wife", we use the terminology "male head" and "female head."

12 months. If they are cohabiting for less than 12 months, the employment data is collected only for the head originally living in that household. Since fertility behavior is likely to be different depending on an individual's relationship status, we separate our analysis for the two types of relationship status: (i) females who are married or cohabiting with a partner for at least 12 months, and (ii) females who are single, separated, divorced, or not cohabiting with a partner for 12 months or more.⁷ To keep the terminology simple throughout the paper, we will refer to the two groups as married and single.

PSID uses the event history calendar method to collect data on the employment history of heads for the survey year and the year prior to the survey. Through this method, the survey asks questions on each job held in that time period, which ensures the availability of a continuous timeline of an individual's employment. In terms of questions relevant to our study, it includes questions regarding whether they stopped working at a job during that period. If a household head reports stopping work, the survey asked them the reason for stopping work. In this study we define a person to have suffered from a job displacement/loss if the person reported any of the following reasons for stopping work: "laid off," "fired," "company folded/ changed hands/ moved out of town," and "employer died/went out of business." We use this job

⁷ Following prior studies on fertility, we only examine the effect on fertility for married couples and single females. We cannot do fertility analysis of men who are single, not cohabiting with a partner, or cohabiting with a partner for less than 12 months. This is because we do not have important information on non-cohabiting partners, such as age of the partner which determines their fecundity. So, if a single man does not have a child, we are unable to find whether this is because that person decided to not have a child or whether this is because his partner does not have the fecundity to conceive a child. Therefore, we cannot examine the impact on likelihood of having children by single men. Additionally, it is important to note that as PSID does not collect data on relationship status, we are unable to identify whether individuals are single or whether they are in a relationship with a non-cohabiting individual.

displacement/loss definition following the methodology of Stevens (1997), Lindo (2010), and others who examined the impact of job displacement using PSID data. Other reasons reported by individuals for not continuing work, which are not part of our job displacement definition, are: strikes, quitting the job, retiring from employment, and the prior job being only a temporary/contractual job. While prior studies had to rely on unemployment data and not job loss data, the PSID is very useful for this study as it allows us to identify actual job losses and avoid cases of voluntary unemployment. In addition to the question on the reason for leaving a job, respondents were also asked the timing (month and year) of the job displacement. Given the gestation period of nine months between conception and birth, the information on timing allows us to identify births that occur too quickly after a job loss and are unlikely to have been affected by the job loss.

A possible concern may be that job loss or childbirth may cause individuals to leave the survey, consequently biasing the results. To test this theory, we conduct two separate estimations to examine the effect of job loss and the effect of childbirth on the incidence of individuals leaving the PSID survey. We find that neither job loss nor childbirth predicts the incidence of individuals leaving the survey.⁸

Timing of Job Losses and Births

Given our interest in the consequences of the Great Recession, we use job displacement data from the five consecutive survey rounds conducted in 2005, 2007, 2009, 2011, and 2013.⁹

⁸ Results are available on request.

⁹ Even though job displacement data is available for the 2015 round, we do not include it in our sample because PSID does not have fertility data for the years following 2015.

Since the Great Recession spanned from December 2007 to June 2009, we define job losses during the recession as those that occurred from January 2008 to June 2009, which are reported in the 2009 survey round. We exclude December 2007 from our analysis because no job losses were reported for that month in our sample. Based on this definition, we create a dummy variable to represent job displacement during the recession, where 1 represents job loss during the recession, and 0 otherwise.

To capture the short-term fertility effects of job losses during the Great Recession, we focus on births occurring during the recessionary period as well as one year after the end of the recession. Since we consider job losses from January 2008 to June 2009, births occurring between October 2008 and June 2010 count as births in the short-term following the job losses during the recession. We do not examine the effect on births before October 2008 because, with the typical gestation period of nine months, the earliest job losses reported in January 2008 cannot affect births before October 2008. We also consider births that occur in the two years following the short-term effect, between July 2010 and June 2012, to examine whether job losses during the recession continue to have lasting effects in the medium-term.

We also correct for job losses that may be occurring during pregnancies. If a birth occurs within eight months following a job loss, then it likely means that the mother was already pregnant when the job loss occurred, i.e., the job loss could not have affected the birth outcome. Therefore, job loss dummies are changed to 0 where births occur before the completion of the nine-month gestation period. For example, if a job loss occurred in February 2009, it cannot affect births before November 2009. So, if a birth occurs somewhere in between those two

months, the corresponding job loss dummy is changed to 0, because the job loss could not have affected the timing of that particular birth.¹⁰

We also examine the impact of job losses during a non-recessionary period as reported in the survey rounds of 2005, 2007, 2011, and 2013, on the likelihood of birth. For each round, any job loss that occurs during the prior year to June of the survey year was assigned a value of 1, or was 0 otherwise.¹¹ Analogous to the short-term and medium-term durations in the recessionary period, we separately focus on (i) births occurring between October of the year prior to the survey to June of the year following the survey for short-term effects, and (ii) the two years following it for the medium-term effects. Table 1 provides the details of the timing of job loss and births examined for each survey round in the short-term and medium-term.

Control Variables

In addition to detailed job loss and fertility data, PSID asks detailed questions on household wealth and income. Based on the questions, PSID calculates three condensed variables that we use as controls: total household wealth, total household income, and value of home equity where the household may be staying.¹² The survey also has household level data, such as the number of

¹⁰ Our results remain robust if those observations are dropped where births occur within eight months of job loss.

¹¹ To test that our results do not depend on the choice of short-term cut-offs, Appendix Table A12 presents the results where we examine job loss data for 21 months instead of the 18 months, i.e. job losses from January 2004 to September 2005, January 2006 to September 2007, and so on for each of the survey rounds. Job losses between October to December of the survey year cannot influence births because of the nine months gestation period.

¹² Total household wealth is calculated by adding all liquid and illiquid wealth owned (not including equity in the home owned where the household is staying) minus debt of the household. Data on the following categories are used for total wealth calculation: value of all household checking and savings accounts, assets owned in business or farm,

household members, and individual level data, such as individual's age, gender, education, race, and religion. All these variables provide us with a rich set of controls for our estimations. To ensure that the control variables are not affected, and consequently biased, by the job displacement variables, we use controls from the prior survey rounds, i.e., rounds 2003 to 2011.

We supplement the PSID job loss data with annual state unemployment data for the survey years from the Bureau of Labor Statistics (2017). As state level economic conditions may influence workers' expectations on future employment and income, and consequently affect fertility decisions, it is important to control for the state unemployment rate.

3. Summary Statistics

We first examine the summary statistics for the key variables used in the analysis. Table 2 presents the summary statistics of job losses to give a sense of the proportion of individuals and households that suffered job losses. Overall, we find that 18.2% of married couples and 17.8% of single females experienced job loss at least once over the five rounds. On average, 4.6% of married couples experienced job loss in a survey round, of which 2.6% are male job losses, and 2.1% are female losses. As expected, job loss rates are substantially higher during the recession (2009 round). 7.8% of married households experienced a job loss during the recession, with

total value of additional real estate owned where the household is not staying, value of stocks owned, value of any vehicles that the household owns, and value of any other type of assets owned not covered in the other questions. Household debt include value of credit card debt, student loan debt, medical debt, legal debt, loans from relatives, farm or business debt, real estate debt of other real estate owned where the household is not staying, and value of other debts not covered in the prior questions. Similar to the wealth calculation, value of home equity is calculated by subtracting the remaining principal amount of the home loan from the value of home. Total household income is calculated by adding last year's taxable income, last year's transfer income, and social security income.

4.9% are male job losses, and 3.1% are female losses. Similarly, for single females, average job loss rate in a round is 4.3%, but the rate jumped to 5.6% during the recession.

Next, in Figure 1, we plot our main dependent variable, birth rates, over the five survey rounds for married and single females. The birth rate for married females was around 17% in the pre-recessionary rounds of 2005 and 2007. However, the birth rate decreased sharply to 15.4% during the recessionary period (2009 round). This sharp decline suggests the possibility of a relationship between job losses during the recession and consequent births. Birth rate decreased further to 14% in the 2011 round and remained steady in the 2013 round. In contrast, the birth rate for single females increased from 5% in 2005 to 7% in 2009, subsequently falling to around 4.5% in the 2011 and 2013 rounds.

Table 3 compares the demographics of households in the sample that experienced job losses during the recession to households that did not, for married females (Columns 1 to 3) and single females (Columns 4 to 6). For married individuals, we find small and statistically insignificant differences between the two groups in terms of birth rates, family size, and the number of children. Females who experienced job losses during the recession are slightly younger (difference of 0.8 years) and slightly less educated (difference of 0.7 years) compared to females who did not experience job loss during the recession. There also exist significant differences based on race and religion. A greater percentage of black households and a smaller percentage of white households report job losses during the recession. Similarly, a smaller percentage of protestant Christians experienced job losses during the recession.

For single females, we observe small differences in magnitude in birth rate, family size, religion, and race between households that did and did not experience job loss during the

recession. However, females in households with job losses are older, have more children, and have slightly fewer years of education compared to females with no job losses.

Table 4 presents the summary statistics of income and wealth of households. Similar to Table 3, we find that the characteristics are very similar for married households that did and did not experience job losses during the recession. We do not find significant differences in per-capita wealth and per-capita household income between those households. When looking at disaggregated income measures of per-capita income of male head and per-capita income of female head, we again find no significant differences between the two groups. However, households with job losses have significantly lower equity in home compared to households with no job loss during the recession. In contrast, for single individuals, households with no job loss during the recession have significantly higher income, wealth, and home equity than households that experienced job losses.

While the focus of this study is to understand the effect of job losses during the Great Recession, it can be useful to examine the effects of job losses in other periods as well. We present supplementary summary statistics in Appendix Tables A2 and A3 that compares households that experienced job losses in at least one survey round to households that never experienced job losses. We find that households that experienced job losses were likely to have a lower income, lower wealth, less education, and higher birth rates compared to households that never experienced job losses. These differences are consistent with findings from prior research on job loss and fertility (Lindo 2010). The differences in some of the individual and household characteristics lend support to the inclusion of these as control variables in our estimation to ensure that our estimates are not biased.

4. Empirical Methodology and Specification

This paper uses a linear model with individual (woman-level) fixed effects to find the effect of job displacements during the Great Recession on the likelihood of birth.¹³ We use the following specification to estimate the short-term effect of job loss on the likelihood of birth:

$$\begin{aligned} Birth_{i,j,t} = & \beta_0 + \sum_k \beta_{1,k} U_{k,j,2009} + \sum_k \beta_{2,k} U_{k,j,t1} + \beta_3 StateU_{j,t} + \beta_4 X_{i,j,t-1} \\ & + \sum_t \beta_{5,t} Round_t + \delta_i + \gamma_{j,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where i , j , and t denote individual, household, and survey rounds. *Birth* is a dummy variable where 0 represents no birth and 1 represents the birth of a child. U_k represents two dummy variables indicating the unemployment from job loss of the k^{th} person of the household, where k represents the male or female head. To distinguish the effect of job losses during the recession, we separate job losses into two sets of variables: (a) job losses during the recession, and (b) job losses during a non-recessionary survey round. $t1$ represents the non-recessionary survey rounds, i.e., 2005, 2007, 2011, and 2013. Our main coefficients of interest are $\beta_{1,k}$, which are the coefficients of the job loss variables from the 2009 round, i.e., the recessionary period.

δ_i represents the individual fixed effects. The individual fixed effects allow us to control for time-invariant characteristics associated with the individual such as gender, race and religion, constant preferences, month and year of birth, household and area characteristics, and other time-invariant factors. This estimation strategy addresses concerns of unobserved heterogeneity

¹³ A linear model is preferred over a non-linear model as it allows easier interpretation of the coefficients. We conduct robustness check using fixed effects (conditional) logit model and find very similar results using this technique in terms of both, the sign of the effect and statistical significance of the coefficients. Results for fixed effects logit model are presented in the Appendix Table A1.

arising from the correlation between these time-invariant factors and both job loss and birth outcomes that can bias the results.

To control for potential time-varying factors that may bias our estimations, we use a rich set of control variables. It is possible that state level economic conditions influence workers' expectations regarding future likelihood of employment, which may then affect their fertility decisions. We include the average annual state unemployment rate, *StateU*, to control for this. *X* represents a set of household level control variables which include per-capita value of household wealth, per-capita household income, per-capita home equity, and family size.¹⁴ Since job losses can have an effect on these controls, we use the lagged values for these variables from the previous survey round ($t-1$), which are also prior to the job losses, thus avoiding endogeneity concerns. *Round* represents a set of dummy variables representing the five survey rounds. We use the month of interview, represented by γ_j , to control for seasonal variations. Standard errors are clustered at the household level. To ensure national representativeness, we use the PSID weights for all estimations in the paper.

5. Results and Discussion

Main Effects

Table 5 shows the estimated coefficients of the impact of job losses during the recession on the likelihood of birth in the short-term among married women. In column (1), we report the

¹⁴ As we control for family size, we do not separately control for the number of children, as the family size is inclusive of it. It is important to note that, given how individual fixed effects work, if the number of children remain the same over all five rounds, the fixed effects will control for it in the estimations. If the number of children changes over the rounds, then the *family size* variable will account for that change in the estimations.

results from the ordinary least squares (OLS) technique without individual fixed effects.¹⁵ We find that the job loss of a female head during the recession decreases the likelihood of birth by 12.1 percentage points, and the job loss of a male head decreases the likelihood of birth by 8 percentage points. Both effects are statistically significant.

The OLS estimation without fixed effects does not account for individual or household level unobserved heterogeneity. To control for time-invariant factors that may be correlated with both job loss and birth outcomes, we use an individual fixed effects model in columns (2) and (3).¹⁶ For the estimation in column (2), we include only the main explanatory variables, i.e., the job loss variables. In contrast to the results in column (1), we find different results for the fixed effects model. Job loss of a male head continues to have a significant effect and its coefficient increases to 11.1 percentage points. This suggests that couples are trying to cope with male job loss by spacing their births. However, the effect of job loss of a female head during the recession decreases to only 4 percentage points and is statistically insignificant. This suggests that the fixed effects is able to control for factors that were biasing the prior results. Going forward, we will be using the individual fixed effects model as our preferred estimation method.

For estimation in column (3), we add all the control variables in the regression. The estimated job displacement coefficients remain qualitatively similar and have the same statistical significance as in column (2). Similar to the effects of job losses during the recession, only job

¹⁵ As fixed effects are not included, we include additional controls for this estimation, such as age, race, religion, education of female head, and education of male head.

¹⁶ The sample size is larger for the fixed effects model (columns 2 and 3) compared to simple OLS (column 1) because the simple OLS estimation controls for male and female head's education which have missing observations, which consequently reduces the sample size.

loss of a male head during non-recessionary period reduces the likelihood of birth and job loss of a female head does not affect the likelihood. It is worth noting that the magnitude of the coefficient of male job loss during the recession (11.4 percentage points) is about 35% greater than the coefficient of job loss in non-recessionary periods (8.5 percentage points). However, this difference is not statistically significant, and this may be because of a lack of statistical power.¹⁷ We also find that state unemployment has a small and statistically insignificant effect on the likelihood of birth. This suggests that people's fertility decision is not influenced by state level economic downturns.¹⁸

¹⁷ Among male heads who suffered job losses during the recession, only 25% of them also lost jobs in a non-recessionary period, which is only 1.1% of the entire sample of individuals. The difference may have been statistically significant if we had greater power in our estimation, which would require a greater fraction of individuals to experience job losses in both recession and non-recessionary period. While our estimations only focus on the individual level behavior, it is worth noting that that even if job losses during the recession had the same effect as job losses in non-recessionary period, there would still be a doubling of effect on fertility at the macro level. This is because the male job loss rate in our sample almost doubled during the recession (as did the national unemployment rate). So, even if the individual effect of job loss during the recession and the non-recessionary period is statistically the same, twice the number of individuals experiencing job loss during the recession should lead to twice the effect on births, given that job losses during non-recessionary period also has a statistically significant effect on the likelihood of birth. Such back-of-the-envelope calculation suggests that there should be fertility differences at the macro level, irrespective of the lack of significant differences in the individual level estimation.

¹⁸ Another way of conducting this estimation is to pool all male and female job losses together (regardless of survey round). It is likely that such an estimation will rely on higher job losses during the recessionary period to drive the results. We find very similar results using that model where male job losses have a large and statistically significant decrease in fertility and female job losses have a small and statistically insignificant effect. We prefer the model

We examine the impact of job losses of single females on their births in Table 6. In column (1), we include only the job loss variables in the regression. In contrast to married couples, we find that a job loss of a single female head during the recession leads to a statistically significant decrease (6.2 percentage points) in the likelihood of birth. This suggests that single females are also potentially using fertility decisions as a mechanism to cope with the effect of job loss during the recession. We include all our control variables in column (2) and find that the coefficients of the job displacement variables remain qualitatively similar (8.2 percentage points). However, job displacement in other periods has a zero effect (coefficient is 0.1 percentage point) on the likelihood of birth. Thus, unlike the results for married households, there is a statistically significant difference between the coefficients of job loss during the recession and during the non-recessionary period. This means that an average single individual was significantly more likely to space births during the recession compared to the non-recessionary period. Similar to the married sample, the state unemployment rate continues to have a statistically insignificant impact.

Effect on Couple's Income

Next, we examine the effect of job loss on a couple's total labor income for married households and individual labor income for single individuals. We do so to examine whether there is a differential effect on income by the gender of the person losing the job, which may then explain the differential effect on fertility.¹⁹ We have previously found that male job loss in

presented above because it helps us understand how job losses specifically during the Great Recession affect fertility decisions, which is the focus of our study. Results are available on request.

¹⁹ We examine the effect on couples' total combined income for married households instead of individual income because, a person's job loss may cause the spouse to work more and therefore lead to more income. For example, a

married households and female job loss in single households reduce the likelihood of birth, but job loss of females in married households do not affect the likelihood (results from Tables 5 and 6). One potential reason is that male heads are traditionally the primary income earner for many married households, and the income of female heads is the main source of income for single females. This may explain why a job loss of these individuals causes a substantial decrease in fertility, via a decrease in household income. This may also explain why a wife's job loss in married households does not influence fertility outcomes as the average decrease in their income following job loss may be small. We test this hypothesis in Table 7 where we examine the effect of job losses on the level and the logarithm of total labor income.²⁰

We find some evidence to support the income hypothesis. Results for married households show that job losses of male heads during the recession significantly reduce the level of the couple's combined labor income (panel a). It is also associated with a substantial drop in income as a share of total income (panel b). This suggests that the income effect following male job losses may be responsible for the fertility effect.

In contrast, job losses of married female heads during the recession do not significantly reduce the level of the combined labor income or the share of the income lost. However, job losses of married female heads in non-recessionary periods significantly reduce combined labor income (panel a) but not lost income as a share of total income (panel b). Given this evidence of

male head's job loss may cause the spouse to work more and earn more to compensate the effect of male job loss, and vice versa, which may then influence fertility decision. Therefore, if we do not examine the effect on the couple's total income, we can be missing important income effects following a spouse's job loss, which may not consequently explain the effect on fertility.

²⁰ We would like to thank the editor and one of the reviewers for suggesting this estimation using the log of income.

a decrease in income following female job losses in non-recessionary periods (panel a of Table 7), along with the evidence of no decrease in subsequent fertility in those non-recessionary periods (column 3 of Table 5), the results suggest that fertility may not be affected through the income channel following job loss of married females.

Similar to the results of married males, job losses of single females during the recession cause a significant reduction in the level of their labor income (panel a) and a significant decrease in income as a share of total income (panel b). In contrast, job losses of single females in non-recessionary periods do not significantly affect labor income. These income effects are in line with the fertility results of single females in Table 6 where we found that job losses during the recession affect fertility but job losses in non-recessionary periods have no effect on fertility. These results support the hypothesis that the income effect of job loss is at least partly responsible for the effect on fertility.

Heterogeneous Effects

It is possible that job displacements have important heterogeneous effects that are masked in the average effects in the prior estimations. In this section, we search for heterogeneity in the effects of job losses in two factors that play crucial roles in fertility decisions: the age of a woman and the income of a household.

First, we examine heterogeneity by age, which can vary depending on the gender of the individual losing the job. Theoretically, there can be two types of age-related effects following a female job loss. A decrease in household income following a female job loss will lead to greater stress and uncertainty, which may cause women of all ages to postpone conception/births. On the other hand, if a woman loses a job and she is unable to find other employment, the opportunity cost of her time will decrease, and she may become more likely to try to conceive a child. For

older women with fewer years of fecundity left, the probability of births may be higher compared to a younger woman who will be fertile for a longer period and therefore can postpone births. Given the two opposing effects (income effect vs. opportunity cost of time effect), the direction of the overall effect of female job losses for older and younger women is unclear.

When a husband loses a job, the heterogeneous effect by age is simpler to understand. There will be an increase in stress and uncertainty due to the loss of income, but the opportunity cost of the wife's time does not decrease. Thus, there will be an incentive to space births following a husband's job loss. In such a scenario, a younger wife may be more likely to space births following a husband's job loss, as she is likely to have more years of fecundity left compared to an older woman.

To investigate the differential effects of job losses by age, we divide women in the sample into five age ranges: ages 24 years and below, 25-29, 30-34, 35-39, and 40-44 years.²¹ Columns (1) and (3) of Table 8 present the proportion of women in each age group by marital status. Not surprisingly, there is a greater proportion of single women (36.6%) relative to the proportion of married women (24.2%) in the youngest two age groups of 29 years and below. Columns (2) and (4) present the proportion of total births among married individuals and single individuals for each age group. For married individuals, we find that individuals aged 34 and below account for 80% of the births. Similarly, for single individuals, the same age group represents 90% of all births.

Table 9 reports the estimated coefficients of the impact of job losses separated by age-groups. In column (1), we examine the impact for married individuals. We find that the job loss

²¹ Our sample size does not allow us to examine the effects by each specific years of age.

of a male head causes a significant decline in the likelihood of birth (magnitude between 23 and 29 percentage points) for women in the two youngest age groups, i.e., women aged 29 and below. This shows that as younger women are likely to be fertile for a longer time, these couples postpone future births to cope with the loss of income in the short-term.

Job losses of married females have a negative effect on the likelihood of birth for all age groups below 40 years, but the effect is statistically significant only for the age group 30 to 34. However, following the job losses of the oldest group of women, i.e., ages 40-44, there is a statistically significant increase in the likelihood of birth by about 6 percentage points. This result is in line with our hypothesis that older women are more likely to give birth following their job loss to account for their comparatively limited fecundity. This result also partly explains why a female's job loss does not have a statistically significant negative effect on the overall likelihood of birth for married couples: the positive effect on fertility for older women slightly compensates for the negative effect for comparatively younger women, which leads to a lower magnitude of the negative effect on overall fertility following a female job loss.

Column (2) presents the results of the age-specific analysis for single women. Job losses of younger women, i.e., ages 24 and below, lead to a statistically significant decline in the likelihood of birth. This suggests that younger females are more likely to postpone conceptions and delay childbirth to later years to cope with income loss.

We also examine the heterogeneous effect of job loss on fertility by household income. Given some households are spacing births following job displacements, it is possible that the decline in fertility is greater for poorer households relative to wealthier households. This is because the lower income households have lesser savings and wealth to fall back on following a job loss compared to wealthier households, and consequently may be more likely to cope with

job loss by spacing births. To understand whether income level plays a role in fertility choices, we interact the job loss variables during the recession with household income from the prior survey round. The results are presented in Table 10. We find a positive and statistically significant effect for the interaction between income and female job loss during the recession. This suggests that poorer households are less likely to have a birth following a female job loss compared to higher income households. This confirms the idea that lower income households have a greater incentive to space births following job losses.

We do not observe a significant effect for the interaction terms of male job loss for married households and female job loss for single households. We observe a significant effect only for married females likely because their opportunity cost of time decreases following a job loss, and females from wealthier households can afford to have a child while also depending on their partner's income. However, we do not observe wealthier single females having significantly more likelihood of having a child following their job loss compared to poorer households likely because they do not have a partner to fall back on like their married counterparts.

Medium-Term Impact

Our focus until now has been on the immediate impact of job displacements on births. To understand whether these fertility effects are temporary or permanent, it is important to examine the longer-term impact on fertility. Given enough time has not passed since the recession to examine the permanent impact on fertility (i.e., the number of births at the end of a mother's fertility), we examine the medium-term impact of the recession on fertility in Table 11. We use an estimation specification for the medium-term effect that is similar to the one used for the short-term effects, but with two adjustments. (i) We examine the impact of job displacements on

births that occur in the two years immediately following the short-term period (detailed earlier in Table 1).²² (ii) To ensure that that our medium-term estimates are not biased, we control for job losses that occur in the following survey round prior to the conceptions of those births.

We present the medium-term results for married individuals split into the first year (column 1) and the second year (column 2) immediately following the short-term period. Given male job loss led to a decline in fertility in the short-term, it is important to understand whether that decline represents a temporary postponement of birth or a longer-term decrease in fertility. We find that in the first year, there is a small and statistically insignificant increase in the likelihood of birth following both male and female job losses. Then in the second year, there is a small and statistically insignificant negative effect on fertility following both male and female job losses. The results suggest that we do not observe a positive rebound in fertility that counteracts the significant decline in fertility in the short-term following male job loss during the recession. This medium-term result may partly explain why we are observing sustained low births rates in the United States at the national level.

We do the same analysis for single individuals in columns (3) and (4). Interestingly, in the first year immediately after the short term, female job loss continues to have a sustained negative and statistically significant impact (6.6 percentage points) on the likelihood of birth. Therefore, female job loss may at least partly explain why, at the national level, the greatest medium-term decline in fertility following the recession occurred to single women primarily in their 20s, as found by Astone, Martin, and Peters (2015). The negative effect on fertility is persisting for a

²² As we do not have birth history data beyond 2014, we are unable to include the job losses reported in the 2013 round in our medium-term analysis. This leads to fewer observations for our medium-term estimations compared to the short-term estimations reported earlier.

longer period for single individuals likely because the single females who were losing jobs during the recession had lower income and wealth relative to those not losing jobs (summary statistics in Table 4). Hence, this may indicate that these females belonged to households with lower socioeconomic status and may have consequently experienced poorer labor market conditions for a period much longer than the recession. Lastly, in column (4), we observe a small and statistically insignificant positive rebound in the likelihood of birth following job loss, which shows that we do not observe a rebound in fertility in our study period. If there is no positive rebound in fertility in the future, then there will be a permanent reduction in total lifetime fertility of these women because of the job losses during the recession.

Robustness Checks

We conduct several robustness checks of our results. While individual fixed effects control for time-invariant factors, one potential concern may be of omitted, time-varying factors driving the results. A key factor, which is correlated with the recession and may also affect fertility decisions, is the housing market crash in 2007. We address this concern by controlling for three reported variables from PSID that capture the effect of changes in the U.S. housing market: (i) dummy variable representing the status of homeownership, (ii) home valuation, and (iii) value of rent. To test whether changes in the housing market affected the regression results on how job loss affects fertility, we include the three housing variables as controls in Table 12. Even with the inclusion of these housing variables, we find that the coefficients of job loss variables remain qualitatively similar to those in our main fertility estimations.

It is possible that other time-varying factors, such as health problems of household members and divorces or separations of couples, may bias our results by both increasing the risk

of job loss and decreasing the willingness to have a child.²³ First, we explore the issue of health problems using detailed data on health shocks in the PSID. Individuals were asked the following general questions on health outcomes:

- (i) “Would you say your health in general is excellent, very good, good, fair, or poor?”, where 5 represents “excellent” and 1 represents “poor.”
- (ii) “Compared to your health say, two years ago, would you say your health is better now, about the same, or worse?”
- (iii) “Do you have any physical or nervous condition that limits the type of work or the amount of work you can do?”

Using these three questions, we create three sets of variables on health outcomes of male heads and female heads: health status ratings ranging from 1 to 5, a dummy variable representing whether their health is worse than two years ago, and a dummy variable representing whether the individual has an illness that limits their work. Using these health data, we examine the impact of job losses on the likelihood of birth after controlling for the health measures. Those results are presented in Appendix Table A4, and we find that our results remain robust after the inclusion of the health measures as controls.

The survey also asks a series of specific questions on whether the individual ever had certain medical conditions. The survey specifically asks about the following medical conditions: stroke, heart attack, heart disease, high blood pressure or hypertension, asthma, chronic lung disease, diabetes, arthritis, memory loss, cancer, and psychological problems in the form of emotional, nervous or psychiatric problem. Using the data on specific medical conditions, we

²³ We would like to thank one of the reviewers for suggesting these useful robustness checks.

create two sets of variables for the male and female heads: a dummy variable representing whether an individual ever had any of these medical conditions and a dummy representing whether an individual had the medical condition for the first time ever in the current survey round (i.e., in the last two years). After controlling for these health conditions, we find that our coefficients remain qualitatively similar to the main estimations (Appendix table A5).

Second, we also test whether divorces or separation biases our results. Household heads who were separated or divorced are part of our single sample. It is possible that the stress of separation led to a job loss and the separation itself reduced the likelihood of childbirth. To test whether separation/divorce biases our results, we examine the impact of job losses on the likelihood of birth after controlling for separation and divorce in the single sample. Given we have data on whether individuals are separated or divorced through their reported relationship status, we use a dummy variable as an indicator of divorce or separation. The results are presented in column 1 of Appendix table A6 and it shows that the job loss of female head during the recession continues to have a negative and statistically significant effect.

It is also possible that our results for the married sample are biased as individuals are dropped from the married sample when they divorce or separate. To check whether our results are biased, we keep the observations of individuals who divorced or separated in our married sample even after the divorce/separation. We find that our results remain robust after controlling for separation and divorce in the estimations, and the results are presented in column (2) of Appendix table A6.

Another concern may be that our results are driven by a time trend that primarily affects individuals who are more likely to experience a job loss; something that cannot be controlled with individual fixed effects or survey round dummies. To address this concern, we estimate two

additional models. First, we interact a linear time trend with different individual and household level characteristics, such as household wealth, household income, home equity, education, and age-range dummies, for the fertility regressions. Second, as time trends may be non-linear in nature, we interact survey year dummies with the same set of individual/household characteristics. We find that the coefficients of the job loss variables remain qualitatively similar after controlling for both types of time trend interactions with individual and household characteristics. The results are presented in Appendix tables A7 to A10. The very small difference with our main results indicates that our results are not driven by a differential time trend that may be experienced by certain types of individuals or households.

Our main estimation was based on the assumption that the recession was unanticipated, and consequently, job losses during the recession were unanticipated. However, if households were, in fact, able to anticipate the shock, they may have changed their behavior in response to the expected shock, biasing our results. We examine in two ways whether households were anticipating job loss during the recession. First, Lindo (2010) indicates that individuals may be able to anticipate job loss or layoffs because the workers sometimes experience fewer hours of work and lower pay long before the actual job loss. We test whether this holds with our data by examining whether changes in income in prior years predict current job loss. More specifically, we estimate the impact of change in income over prior two survey rounds on job loss in the current survey round. While this estimation is likely inherently endogenous, it may still provide useful suggestive evidence. As shown in the results in Table 13, we find that prior income change does not predict job displacement. This shows that individuals with a prior decrease in income should not be able to predict job loss.

Another test of whether households are expecting the job loss is to reverse the main estimation, i.e., whether childbirth predicts job displacement. If households are changing fertility decision based on anticipation of job loss, then fertility decisions should predict job displacement in the regressions. So, we reverse our main estimation where we estimate whether childbirth in the prior round predicts job loss in the current round. Our estimations show that births have no impact on job displacement. The results are presented in Appendix Table A11.

6. Conclusion

In this paper, we examine the impact of job losses during the Great Recession on the likelihood of birth. For married couples, we find that job losses of male heads during the recession led to a significant decline in the likelihood of birth in the short-term, and no positive rebound in fertility in the medium-term. This suggests that job losses during the recession are having a longer-term negative effect on fertility. In contrast, job losses of female heads during the recession do not affect the likelihood of birth in the short-term or medium-term because of differential effects by mothers' age on fertility following female job losses. The negative short-term effect on fertility of younger women following female job loss is partly compensated by a positive impact on fertility for older mothers. Older mothers are more likely to have a birth following a job loss as they have fewer years of fertility left and their opportunity cost of time decreases following the job loss.

For single females, we find that a job loss during the recession leads to a significant decline in the likelihood of birth. The fertility decline even persists into the medium-term, which suggests that the recession is having a much longer-term impact on single females and their fertility decisions.

The findings of this study can explain the medium-term fertility outcomes and can have long term fertility implications in the United States. According to the U.S. Department of Health and Human Services, the birth rate of single women has been decreasing since the recession (NCHS, 2017). Our findings indicate that job losses may explain at least part of that decline in fertility. The same report also suggests a general decline in fertility for married individuals since the recession as well. Our findings suggest that male job losses may have contributed to that decline. In the medium term, our study shows that there has not been a positive rebound in fertility following the initial decline, which explains, at least partly, the continued low birth rates in the United States. However, it is possible that a positive rebound in fertility may occur in later years, something for which we will need future research. Additionally, to be able to predict future birth rates, there is a need for further research that examines other factors, including demographic factors, that may have also contributed to the recent decline in the U.S. fertility rate.

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Table 1: Timing of job loss and births for each survey round

Survey Year	Timing Examined For:		
	Job Loss	Short-Term Births	Medium-Term Births ²⁴
2005	January 2004 - June 2005	October 2004 - June 2006	July 2006 - June 2008
2007	January 2006 - June 2007	October 2006 - June 2008	July 2008 - June 2010
2009	January 2008 - June 2009	October 2008 - June 2010	July 2010 - June 2012
2011	January 2010 - June 2011	October 2010 - June 2012	July 2012 - June 2014
2013	January 2012 - June 2013	October 2012 - June 2014	

²⁴ Note that the short-term birth duration overlaps with the previous round medium-term birth duration. We address any biases arising from this overlap in our estimation methodology. Also, note that as we do not have birth data beyond 2014, we are unable to include the 2013 survey round for medium term analysis.

Table 2: Summary statistics of job loss rates

	Married	Single
Fraction of households that experienced:		
Job loss at least once over all five survey rounds	18.2%	17.8%
Male job loss at least once over all five survey rounds	10.2%	
Female job loss at least once over all five survey rounds	9.3%	17.3%
Average job loss rate in a round	4.6%	4.3%
Average male job loss rate in a round	2.6%	
Average female job loss rate in a round	2.1%	4.3%
Job loss during recession	7.8%	5.6%
Male job loss during recession	4.9%	
Female job loss during recession	3.1%	5.6%

Table 3: Summary statistics of demographic characteristics of married and single female heads

	Married			Single		
	Households with no job loss during recession	Households with job loss during recession	Difference	Households with no job loss during recession	Households with job loss during recession	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Birth rate	16.5% (0.423)	15.7% (0.472)	0.8%	4.5% (0.27)	6.0% (0.30)	-1.5%
Family size	3.5 (1.54)	3.6 (1.88)	-0.1	2.3 (2.13)	2.6 (1.68)	-0.3***
Number of children	1.7 (1.50)	1.8 (1.64)	-0.1	1.2 (2.04)	1.8 (1.52)	-0.6***
Age of female head	34.1 (6.91)	33.3 (7.11)	0.8***	32.4 (10.05)	34.2 (10.08)	-1.8***
Years of schooling of female	14.2 (2.79)	13.5 (3.32)	0.7***	13.7 (3.72)	12.7 (3.56)	1***
Years of schooling of male	13.8 (2.99)	12.9 (3.37)	0.9***			
Religion: Catholic	24.8% (0.52)	24.8% (0.55)	0%	18.4% (0.64)	18.4% (0.58)	0%
Religion: Protestant	51.0% (0.59)	44.0% (0.63)	7%***	53.1% (0.76)	54.1% (0.78)	-1%
Religion: Jewish	1.7% (0.18)	2.6% (0.19)	-0.9%	2.8% (0.28)	0% (0.00)	2.8%***
Race: White	86.1% (0.40)	77.3% (0.56)	8.8%***	66.5% (0.66)	61.7% (0.73)	4.8%
Race: Black	6.3% (0.27)	13.0% (0.47)	-6.7%***	27.7% (0.60)	33.9% (0.70)	-6.2%
Number of observations	8119	676		4388	268	
Number of individuals	2066	169		1170	69	

Note: Unless otherwise stated, these summary statistics of demographic characteristics are of female head. The averages are over all five survey rounds. Standard deviations are in parenthesis. For the columns with the differences (columns 3 and 6), *** indicates significance at 1% level; ** at 5%; * at 10%.

Table 4: Summary statistics of wealth and income

	Married			Single		
	Households with no job loss during recession	Households with job loss during recession	Difference	Households with no job loss during recession	Households with job loss during recession	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Per-capita annual household income	12,285 (116,797)	11,735 (31,567)	550	20,760 (50,006)	7,671 (18,997)	13,088***
Per-capita wealth	37,171 (231,088)	34,547 (169,419)	2,624	21,184 (303,080)	822.07 (12,618)	20,362***
Per-capita annual labor income of male head	16,665 (25,448)	15,039 (35,698)	1,626			
Per-capita annual labor income of female head	8,783 (13,900)	8,739 (25,852)	44	19,156 (41,049)	8,364 (18,455)	10,792***
Per-capita equity in home	19,707 (51,382)	12,620 (43,111)	7,087***	12,468 (76,598)	4,366 (31,391)	8,102***
Number of observations	8119	676		4388	268	
Number of individuals	2066	169		1170	69	

Note: Averages are over all five survey rounds. Standard deviations are in parenthesis. For the columns with the differences (columns 3 and 6), *** indicates significance at 1% level; ** at 5%; * at 10%.

Table 5: Impact of job loss during the recession on the likelihood of birth for married female heads

Dependent variable: Specification	Likelihood of birth		
	(1)	(2)	(3)
	OLS	FE	FE
Job loss of male head during recession	-0.080** (0.037)	-0.111** (0.050)	-0.114** (0.055)
Job loss of female head during recession	-0.121*** (0.038)	-0.040 (0.048)	-0.048 (0.050)
State unemployment rate	-0.005 (0.006)		-0.003 (0.006)
Job loss of male head in non-recessionary periods	-0.105*** (0.028)	-0.099*** (0.030)	-0.085*** (0.028)
Job loss of female head in non-recessionary periods	-0.045 (0.031)	-0.048 (0.043)	-0.027 (0.040)
Wealth x 1,000,000	0.033 (0.032)		0.026 (0.023)
Household Income x 100,000	-0.007 (0.004)		-0.018*** (0.002)
Home equity x 100,000	0.016 (0.016)		0.017 (0.029)
Family size	-0.020*** (0.004)		-0.110*** (0.008)
Control for month of interview dummy	Yes	No	Yes
Control for survey round dummy	Yes	No	Yes
Number of observations	8,218	8,795	8,795
Number of individuals		2,235	2,235

Note: Linear Model. Columns 2 and 3 represent individual fixed effects estimations. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. Estimation in column 1 also controls for age, race, religion, and education of female head, and education of male head.

Table 6: Impact of job loss during the recession on the likelihood of birth for single female heads

Dependent variable: Specification	Likelihood of birth	
	(1) FE	(2) FE
Job loss of female head during recession	-0.062** (0.030)	-0.082** (0.032)
Job loss of female head in non-recessionary periods	0.002 (0.036)	0.001 (0.037)
State unemployment rate		0.009 (0.006)
Wealth x 1,000,000		0.005 (0.009)
Household Income x 100,000		-0.000 (0.013)
Home equity x 100,000		0.003 (0.005)
Family size		-0.024*** (0.006)
Control for month of interview dummy	No	Yes
Control for survey round dummy	No	Yes
Number of observations	4,656	4,656
Number of individuals	1,239	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%.

Table 7: Impact of individual job loss on total labor income

Panel (a): Impact on level of total income		
Dependent Variable:	Married couple's total labor income	Single female's total labor income
	(1)	(2)
Job loss of male head during recession	-17,732*** (3,823)	
Job loss of female head during recession	-12,270 (9,577)	-11,238*** (3,004)
State unemployment rate	340.9 (671.1)	149.0 (628.8)
Job loss of male head in non-recessionary periods	-10,423** (4,096)	
Job loss of female head in non-recessionary periods	-10,402*** (3,273)	-4,044 (2,908)
Number of observations	8,795	4,656
Number of individuals	2,235	1,239
Panel (b): Impact on log of total income		
Dependent Variable:	Married couple's total log labor income	Single female's total log labor income
	(1)	(2)
Job loss of male head during recession	-1.101*** (0.415)	
Job loss of female head during recession	-0.153 (0.130)	-1.752* (1.060)
State unemployment rate	0.00872 (0.0249)	-0.0142 (0.0636)
Job loss of male head in non-recessionary periods	0.235 (0.189)	
Job loss of female head in non-recessionary periods	-0.279*** (0.108)	-0.895 (0.702)
Number of observations	8,795	4,656
Number of individuals	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.

Table 8: Proportion of the sample population in each age group by marital status and proportion of births in each age group by marital status

Age group:	(1)	(2)	(3)	(4)
	Proportion of married females	Proportion of total births among married females	Proportion of single females	Proportion of total births among single females
24 and below	6.4%	14.0%	13.1%	44.4%
25-29	17.8%	30.1%	23.5%	30.7%
30-34	26.7%	36.3%	22.6%	14.7%
35-39	27.7%	16.9%	22.0%	7.8%
40-44	21.4%	2.7%	18.9%	2.4%
Total:	100%	100%	100%	100%

Table 9: Impact of job loss during recession on the likelihood of birth by age group

Dependent variable:	Likelihood of birth	
	Married	Single
	(1)	(2)
Male head's job loss during recession		
x Ages 24 and below	-0.233*	
	(0.140)	
x Ages 25-29	-0.285***	
	(0.096)	
x Ages 30-34	0.090	
	(0.163)	
x Ages 35-39	-0.037	
	(0.064)	
x Ages 40-44	-0.038	
	(0.049)	
Female head's job loss during recession		
x Ages 24 and below	-0.049	-0.240**
	(0.151)	(0.104)
x Ages 25-29	-0.001	-0.085
	(0.051)	(0.108)
x Ages 30-34	-0.091**	-0.015
	(0.045)	(0.012)
x Ages 35-39	-0.067	-0.060
	(0.124)	(0.037)
x Ages 40-44	0.061***	-0.022
	(0.018)	(0.015)
State unemployment rate	-0.003	0.009
	(0.006)	(0.006)
Male head's job loss in non-recessionary periods	-0.082***	
	(0.029)	
Female head's job loss in non-recessionary periods	-0.024	0.002
	(0.040)	(0.037)
Number of observations	8,795	4,656
Number of individuals	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for state

unemployment rate, household wealth, household income, household home equity, family size, month of interview and year of survey.

Table 10: Heterogeneous impact by household income of job loss on the likelihood of birth

Dependent variable:	Likelihood of birth	
	(1)	(2)
	Married	Single
Job loss of male head during recession x Household income	-0.148 (0.179)	
Job loss of female head during recession x Household income	0.287** (0.134)	0.197 (0.222)
Job loss of male head during recession	-0.081 (0.074)	
Job loss of female head during recession	-0.162*** (0.049)	-0.105** (0.051)
State unemployment rate	-0.003 (0.006)	0.009* (0.006)
Job loss of male head in non-recessionary periods	-0.086*** (0.028)	
Job loss of female head in non-recessionary periods	-0.027 (0.040)	0.001 (0.037)
Wealth x 1,000,000	0.023 (0.023)	0.006 (0.008)
Household Income x 100,000	-0.013** (0.006)	-0.005 (0.008)
Home equity x 100,000	0.016 (0.029)	0.005 (0.006)
Family size	-0.110*** (0.008)	-0.024*** (0.006)
Number of observations	8,795	4,656
Number of individuals	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. ***

indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.

Table 11: Impact of job loss on the likelihood of birth in the medium term

	Married		Single	
	(1)	(2)	(3)	(4)
Dependent variable (dummies):	Births 0-12 months after short-term birth history	Births 12-24 months after short-term birth history	Births 0-12 months after short-term birth history	Births 12-24 months after short-term birth history
Job loss of male head during recession	0.025 (0.041)	-0.019 (0.031)		
Job loss of female head during recession	0.038 (0.047)	-0.036 (0.029)	-0.066* (0.039)	0.032 (0.032)
State unemployment rate	0.009 (0.005)	0.003 (0.004)	0.004 (0.004)	-0.001 (0.004)
Job loss of male head in non-recessionary periods	-0.047 (0.044)	-0.022 (0.023)		
Job loss of female head in non-recessionary periods	0.013 (0.037)	-0.032 (0.026)	-0.016 (0.018)	-0.014 (0.030)
Job loss of male head in following round	0.016 (0.133)	0.001 (0.026)		
Job loss of female head in following round	0.110 (0.123)	-0.051** (0.022)	0.083 (0.097)	0.019 (0.023)
Number of observations	7,295	7,295	3,876	3,876
Number of individuals	2,235	2,235	1,239	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for household wealth, household income, household home equity, family size, month of interview and year of survey.

Table 12: Impact of job loss on the likelihood of birth after controlling for homeownership, house valuation, and value of rent paid

Dependent variable:	Likelihood of birth			
	Married		Single	
	(1)	(2)	(3)	(4)
Job loss of male head during recession	-0.112** (0.055)	-0.119** (0.056)		
Job loss of female head during recession	-0.050 (0.050)	-0.056 (0.052)	-0.081** (0.032)	-0.073** (0.032)
State unemployment rate	-0.003 (0.006)	-0.002 (0.006)	0.009 (0.006)	0.008 (0.006)
Job loss of male head in non-recessionary periods	-0.083*** (0.029)	-0.081*** (0.029)		
Job loss of female head in non-recessionary periods	-0.028 (0.040)	-0.025 (0.040)	0.002 (0.037)	0.003 (0.038)
Ownership of house (dummy)	0.036* (0.020)	0.000 (0.029)	0.009 (0.015)	-0.009 (0.026)
Value of house		0.013* (0.008)		0.013* (0.008)
Rent paid		-0.049 (0.234)		-0.026 (0.246)
Wealth equity x 1,000,000	0.024 (0.023)	0.018 (0.022)	0.005 (0.009)	0.003 (0.009)
Household income x 100,000	-0.018*** (0.002)	-0.019*** (0.002)	-0.000 (0.013)	0.003 (0.015)
Home equity x 100,000	0.017 (0.029)	0.019 (0.029)	0.003 (0.005)	0.004 (0.005)
Family size	-0.110*** (0.008)	-0.111*** (0.008)	-0.024*** (0.006)	-0.024*** (0.006)
Number of observations	8,795	8,648	4,655	4,539
Number of individuals	2,235	2,233	1,239	1,237

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.

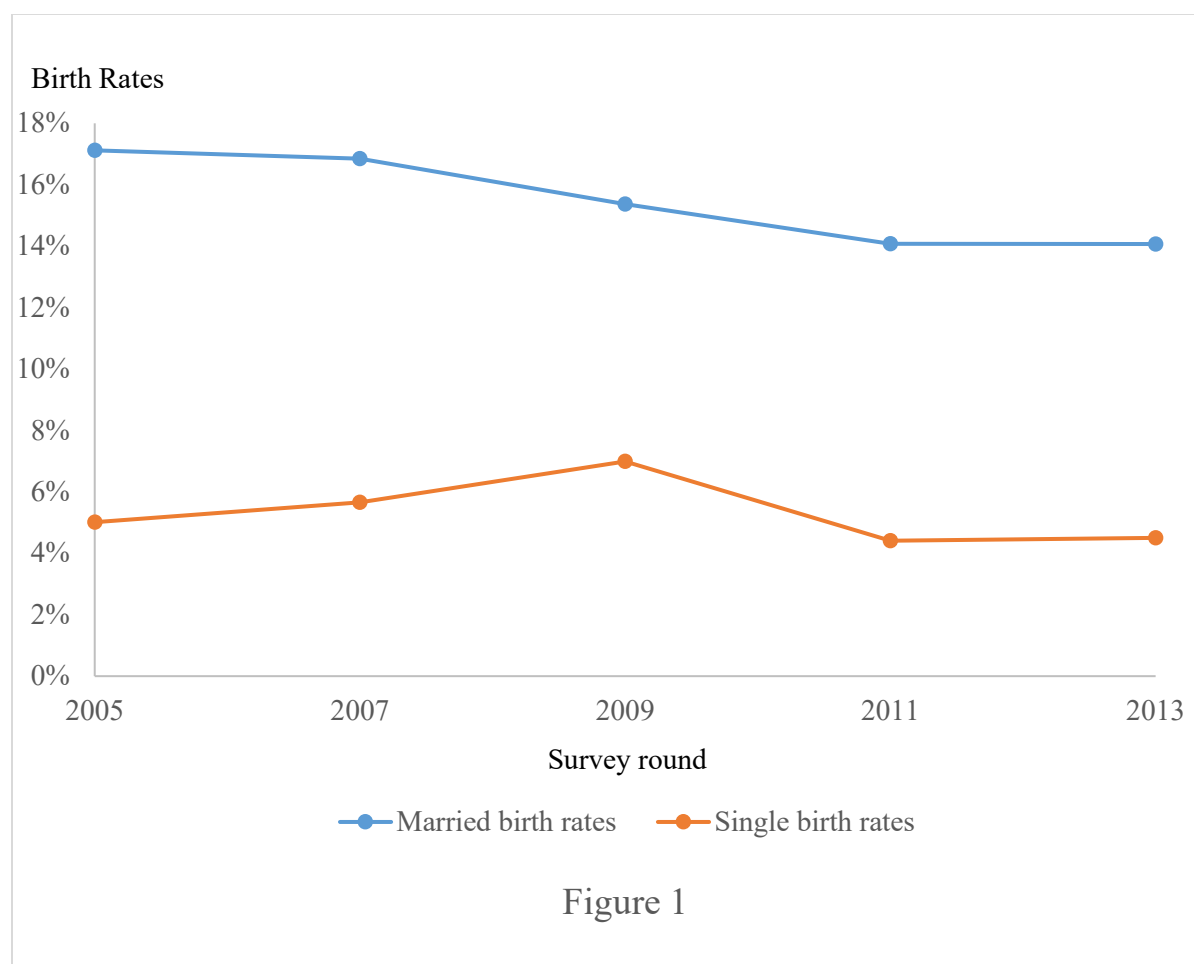
Table 13: Impact of change in labor income in prior two survey rounds on the likelihood of job loss

Dependent variable:	Married		Single
	Job loss of male head	Job loss of female head	Job loss of female head
	(1)	(2)	(3)
Change in income of male head (x \$1,000,000)	-0.002 (0.003)		
Change in income of female head (x \$1,000,000)		0.021 (0.016)	-0.022 (0.020)
State unemployment rate	0.003 (0.002)	0.004 (0.003)	0.002 (0.005)
Wealth x 1,000,000	-0.004 (0.003)	-0.001 (0.005)	0.023 (0.026)
Home equity x 100,000	-0.003 (0.007)	0.003 (0.008)	-0.011 (0.010)
Family size	-0.007** (0.003)	-0.002 (0.003)	-0.005 (0.004)
Number of observations	8,748	8,739	4,616
Number of individuals	2,235	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.

Figure captions:

Figure 1: Birth rates for married females and single females over five survey rounds



Appendix

Table A1: Impact of job loss on the likelihood of birth of married females using logit model

Dependent variable:		Likelihood of birth	
Specification:	Logit model		Conditional (fixed effects) logit model
	Odds ratio	Marginal effects	Odds ratio
	(1)	(2)	(3)
Job loss of male head during recession	0.423** (0.157)	-0.109** (0.047)	0.346*** (0.149)
Job loss of female head during recession	0.211** (0.138)	-0.197** (0.082)	0.450 (0.967)
State unemployment rate	0.982 (0.045)	-0.002 (0.006)	0.986 (0.050)
Job loss of male head in non-recessionary periods	0.318*** (0.134)	-0.145*** (0.053)	0.249*** (0.129)
Job loss of female head in non-recessionary periods	0.377** (0.153)	-0.123** (0.051)	0.351** (0.182)
Wealth equity x 1,000,000	1.046 (0.211)	0.006 (0.026)	1.002 (0.183)
Household Income x 100,000	0.973 (0.034)	-0.004 (0.004)	0.919 (0.402)
Home equity x 100,000	1.08 (0.118)	0.010 (0.014)	0.957 (0.195)
Family size	0.859*** (0.024)	-0.019*** (0.004)	0.604*** (0.036)
Number of observations	8,195	8,195	4,405
Number of individuals			1070

Note: Standard errors are in parentheses and are computed after correcting for correlation and

heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All

estimations control for month of interview and year of survey. Estimation in columns 1 and 2 also controls for age, race, religion, and education of female head, and education of male head.

Table A2: Summary statistics of demographic characteristics comparing households that lost jobs in any period to households that did not experience job loss in any period

	Married			Single		
	Households with no job loss in any period	Households with job loss in any period	Difference	Households with no job loss in any period	Households with job loss in any period	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Birth rate	16.7% (0.422)	15.3% (0.444)	1.4%	4.1% (0.26)	7.9% (0.38)	-3.8%***
Family size	3.5 (1.53)	3.6 (1.75)	-0.1**	2.3 (2.10)	2.6 (2.13)	-0.3***
Number of children	1.7 (1.50)	1.8 (1.57)	-0.1***	1.1 (2.01)	1.6 (2.07)	-0.5***
Age of female head	34.1 (6.79)	33.3 (7.69)	0.8***	32.4 (9.95)	32.9 (10.61)	-0.5
Years of schooling of female	14.3 (2.76)	13.2 (2.98)	1.1***	13.7 (3.68)	12.8 (3.63)	0.9***
Years of schooling of male	13.9 (2.97)	12.9 (3.14)	1***			
Religion: Catholic	24.6% (0.52)	26.0% (0.58)	-1.4%	18.9% (0.64)	14.5% (0.58)	4.4%**
Religion: Protestant	51.4% (0.59)	45.8% (0.63)	5.6%***	53.1% (0.74)	53.5% (0.83)	-0.4%
Religion: Jewish	1.8% (0.19)	1.4% (0.14)	0.4%	3.1% (0.28)	0% (0.00)	3.1%***
Race: White	87.1% (0.39)	76.8% (0.55)	10.3%***	67.4% (0.64)	58.5% (0.78)	8.9%***
Race: Black	5.7% (0.26)	12.5% (0.41)	-6.8%***	26.7% (0.58)	37.1% (0.74)	-10.4%***
Number of observations	7,232	1,563		3,817	839	
Number of individuals	1,828	407		1,019	220	

Note: Unless otherwise stated, these summary statistics of demographic characteristics are of female head. The averages are over all five survey rounds. Standard deviations are in parenthesis. For the columns with the differences (columns 3 and 6), *** indicates significance at 1% level; ** at 5%; * at 10%.

Table A3: Summary statistics of wealth and income comparing households that lost jobs in any period to households that did not experience job loss in any period

	Married			Single		
	Households with no job loss in any period	Households with job loss in any period	Difference	Households with no job loss in any period	Households with job loss in any period	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Per-capita annual household income	12,757 (121,119)	9,368 (23,584)	3,389**	21,776 (50,321)	9,141 (23,200)	12,635***
Per-capita wealth	39,853 (238,854)	20,838 (123,215)	19,014***	22,179 (306,623)	6,977 (127,958)	15,202***
Per-capita annual labor income of male head	17,212 (25,927)	12,854 (26,660)	4,358***			
Per-capita annual labor income of female head	9,038 (14,083)	7,318 (19,027)	1,720***	20,064 (41,147)	9,127 (22,159)	10,937***
Per-capita equity in home	20,627 (52,300)	11,401 (37,558)	9226***	12,972 (76,712)	6,104 (50,912)	6,868***
Number of observations	7,232	1,563		3,817	839	
Number of individuals	1,828	407		1,019	220	

Note: Averages are over all five survey rounds. Standard deviations are in parenthesis. For the columns with the differences (columns 3 and 6), *** indicates significance at 1% level; ** at 5%; * at 10%.

Table A4: Impact of job loss on the likelihood of birth after controlling for changes in health status

Dependent variable:	Likelihood of birth					
	Married			Single		
	(1)	(2)	(3)	(4)	(5)	(6)
Job loss of male head during recession	-0.119** (0.055)	-0.113** (0.055)	-0.118** (0.055)			
Job loss of female head during recession	-0.047 (0.050)	-0.047 (0.050)	-0.051 (0.052)	-0.079** (0.032)	-0.083*** (0.032)	-0.076** (0.032)
State unemployment rate	-0.003 (0.006)	-0.003 (0.006)	-0.003 (0.006)	0.008 (0.006)	0.009 (0.006)	0.008 (0.006)
Job loss of male head in non-recessionary periods	-0.084*** (0.028)	-0.085*** (0.028)	-0.076** (0.029)			
Job loss of female head in non-recessionary periods	-0.026 (0.041)	-0.026 (0.040)	-0.030 (0.041)	0.013 (0.035)	-0.001 (0.037)	0.015 (0.035)
Health status of male head	-0.003 (0.008)					
Health status of female head	-0.011 (0.009)			-0.003 (0.006)		
Health worsened for male head		-0.004 (0.018)				
Health worsened for female head		-0.007 (0.018)			0.028 (0.017)	
Health problem limiting work for male head			-0.003 (0.022)			
Health problem limiting work for female head			0.059** (0.024)			-0.019 (0.020)
Number of observations	8,736	8,795	8,731	4,643	4,656	4,639
Number of individuals	2,233	2,235	2,233	1,239	1,239	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for household wealth, household income, household home equity, family size, month of interview and year of survey.

Table A5: Impact of job loss on the likelihood of birth after controlling for medical conditions

Dependent variable:	Likelihood of birth			
	Married		Single	
	(1)	(2)	(3)	(4)
Job loss of male head during recession	-0.114** (0.055)	-0.114** (0.055)		
Job loss of female head during recession	-0.048 (0.051)	-0.055 (0.051)	-0.081** (0.032)	-0.081** (0.032)
State unemployment rate	-0.003 (0.006)	-0.003 (0.006)	0.009 (0.006)	0.009 (0.006)
Job loss of male head in non-recessionary periods	-0.085*** (0.028)	-0.085*** (0.028)		
Job loss of female head in non-recessionary periods	-0.025 (0.040)	-0.028 (0.040)	0.002 (0.038)	0.001 (0.037)
Medical condition of male head	0.012 (0.015)			
Medical condition of female head	-0.017 (0.015)		0.003 (0.016)	
New medical condition of male head		0.028** (0.012)		
New medical condition of female head		-0.002 (0.013)		-0.006 (0.010)
Number of observations	8,795	8,795	4,656	4,656
Number of individuals	2,235	2,235	1,239	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed

after correcting for correlation and heteroskedasticity within household clusters. *** indicates

significance at 1% level; ** at 5%; * at 10%. All estimations control for household wealth, household

income, household home equity, family size, month of interview and year of survey.

Table A6: Impact of job loss on the likelihood of birth after controlling for divorce or separation

Dependent Variable:	Likelihood of birth	
	Single and divorced sample	Married and divorced sample
	(1)	(2)
Job loss of male head during recession		-0.117** (0.055)
Job loss of female head during recession	-0.081** (0.032)	-0.055 (0.042)
State unemployment rate	0.010* (0.006)	-0.001 (0.006)
Job loss of male head in non-recessionary periods		-0.084*** (0.028)
Job loss of female head in non-recessionary periods	0.006 (0.038)	-0.019 (0.037)
Separation or divorce	-0.129 (0.084)	-0.121* (0.068)
Number of observations	4,656	9,541
Number of individuals	1,239	2,505

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for household wealth, household income, household home equity, family size, month of interview and year of survey.

Table A7 - Impact of job loss on the likelihood of birth for married females after controlling for individual and household level variables interacted with linear time trend

Dependent variable:	Likelihood of birth				
	(1)	(2)	(3)	(4)	(5)
Job loss of male head during recession	-0.114** (0.055)	-0.117** (0.055)	-0.114** (0.055)	-0.127** (0.057)	-0.111** (0.055)
Job loss of female head during recession	-0.048 (0.050)	-0.050 (0.049)	-0.049 (0.050)	-0.047 (0.051)	-0.051 (0.050)
Job loss of male head in non-recessionary periods	-0.085*** (0.028)	-0.084*** (0.028)	-0.085*** (0.028)	-0.081*** (0.030)	-0.086*** (0.029)
Job loss of female head in non-recessionary periods	-0.027 (0.040)	-0.025 (0.040)	-0.027 (0.040)	-0.034 (0.042)	-0.028 (0.040)
Wealth equity x Time Trend	0.004 (0.025)				
Household income x Time Trend		0.138*** (0.037)			
Home equity x Time Trend			-0.009 (0.014)		
Education x Time Trend				0.002 (0.001)	
Age range 24 and below x Time Trend					-0.017 (0.021)
Age range 24-29 x Time Trend					-0.026** (0.013)
Age range 30-34 x Time Trend					-0.016* (0.008)
Age range 35-39 x Time Trend					-0.024*** (0.007)
Age range 40-44 x Time Trend					-0.028*** (0.006)
Number of observations	8,795	8,795	8,795	8,413	8,795
Number of individuals	2,235	2,235	2,235	2,220	2,235

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are clustered at the

household level. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for state

unemployment rate, household wealth, income, home equity, family size, month of interview and a linear time trend.

Table A8 - Impact of job loss on the likelihood of birth for single females after controlling for individual and household level variables interacted with linear time trend

Dependent variable:	Likelihood of birth				
	(1)	(2)	(3)	(4)	(5)
Job loss of female head during recession	-0.081** (0.032)	-0.082** (0.032)	-0.082** (0.032)	-0.085** (0.037)	-0.085*** (0.033)
Job loss of female head in non-recessionary periods	0.001 (0.037)	0.004 (0.037)	0.002 (0.037)	0.001 (0.040)	-0.002 (0.038)
Wealth equity x Time Trend	0.006 (0.007)				
Household income x Time Trend		0.045*** (0.009)			
Home equity x Time Trend			0.006 (0.004)		
Education x Time Trend				0.003** (0.001)	
Age range 24 and below x Time Trend					-0.022 (0.016)
Age range 24-29 x Time Trend					-0.033*** (0.010)
Age range 30-34 x Time Trend					-0.024*** (0.007)
Age range 35-39 x Time Trend					-0.017*** (0.006)
Age range 40-44 x Time Trend					-0.015*** (0.005)
Number of observations	4,656	4,656	4,656	4,564	4,656
Number of individuals	1,239	1,239	1,239	1,234	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are clustered at the household level. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for state

unemployment rate, household wealth, income, home equity, family size, month of interview and a linear time trend.

Table A9 - Impact of job loss on the likelihood of birth for married females after controlling for individual and household level variables interacted with survey year dummies

Dependent variable:	Likelihood of birth				
	(1)	(2)	(3)	(4)	(5)
Job loss of male head during recession	-0.114** (0.055)	-0.118** (0.055)	-0.121** (0.055)	-0.131** (0.057)	-0.113** (0.055)
Job loss of female head during recession	-0.048 (0.050)	-0.051 (0.047)	-0.050 (0.052)	-0.046 (0.052)	-0.053 (0.050)
Job loss of male head in non-recessionary periods	-0.085*** (0.028)	-0.083*** (0.029)	-0.083*** (0.028)	-0.080*** (0.030)	-0.096*** (0.028)
Job loss of female head in non-recessionary periods	-0.027 (0.040)	-0.026 (0.040)	-0.025 (0.040)	-0.034 (0.041)	-0.028 (0.040)
Wealth equity x Survey year dummies	Yes	No	No	No	No
Household income x Survey year dummies	No	Yes	No	No	No
Home equity x Survey year dummies	No	No	Yes	No	No
Education x Survey year dummies	No	No	No	Yes	No
Age range dummies x Survey year dummies	No	No	No	No	Yes
Number of observations	8,795	8,795	8,795	8,413	8,795
Number of individuals	2,235	2,235	2,235	2,220	2,235

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are clustered at the household level. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for state unemployment rate, household wealth, income, home equity, family size, month of interview and year of survey.

Table A10 - Impact of job loss on the likelihood of birth for single females after controlling for individual and household level variables interacted with survey year dummies

Dependent variable:	Likelihood of birth				
	(1)	(2)	(3)	(4)	(5)
Job loss of female head during recession	-0.082** (0.032)	-0.084** (0.033)	-0.083** (0.032)	-0.086** (0.038)	-0.091*** (0.034)
Job loss of female head in non-recessionary periods	0.002 (0.037)	0.004 (0.037)	0.002 (0.037)	0.002 (0.039)	-0.001 (0.038)
Wealth equity x Survey year dummies	Yes	No	No	No	No
Household income x Survey year dummies	No	Yes	No	No	No
Home equity x Survey year dummies	No	No	Yes	No	No
Education x Survey year dummies	No	No	No	Yes	No
Age range dummies x Survey year dummies	No	No	No	No	Yes
Number of observations	4,656	4,656	4,656	4,564	4,656
Number of individuals	1,239	1,239	1,239	1,234	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are clustered at the household level. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for state unemployment rate, household wealth, income, home equity, family size, month of interview and year of survey.

Table A11: Impact of prior birth on likelihood of job loss

Dependent variable:	Married		Single
	Male job loss	Female job loss	Female job loss
	(1)	(2)	(3)
Birth in prior round	0.004 (0.004)	-0.003 (0.004)	-0.001 (0.013)
Wealth equity x 1,000,000	-0.001 (0.002)	0.004 (0.003)	0.019 (0.023)
Household Income x 100,000	0.000 (0.000)	-0.000 (0.000)	-0.004 (0.011)
Home equity x 100,000	0.001 (0.004)	-0.002 (0.007)	-0.002 (0.008)
Family size	-0.001 (0.002)	-0.001 (0.002)	-0.005* (0.003)
Number of observations	8,795	8,795	4,656
Number of individuals	2,235	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed after correcting for correlation and heteroskedasticity within household clusters. *** indicates significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.

Table A12: Impact of job loss that includes job losses from July to September of the survey year on the likelihood of birth

Dependent variable:	Likelihood of birth	
	Married	Single
	(1)	(2)
Job loss of male head during recession	-0.114** (0.052)	
Job loss of female head during recession	-0.047 (0.047)	-0.082** (0.032)
State unemployment rate	-0.003 (0.006)	0.009 (0.006)
Job loss of male head in non-recessionary periods	-0.083*** (0.028)	
Job loss of female head in non-recessionary periods	-0.027 (0.040)	0.001 (0.037)
Wealth equity x 1,000,000	0.026 (0.023)	0.005 (0.009)
Household income x 100,000	-0.018*** (0.002)	-0.000 (0.013)
Home equity x 100,000	0.017 (0.029)	0.003 (0.005)
Family size	-0.110*** (0.008)	-0.024*** (0.006)
Number of observations	8,795	4,656
Number of individuals	2,235	1,239

Note: Linear model with individual fixed effects. Standard errors are in parentheses and are computed

after correcting for correlation and heteroskedasticity within household clusters. *** indicates

significance at 1% level; ** at 5%; * at 10%. All estimations control for month of interview and year of survey.