Cyclical unemployment and infant health

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A B S T R A C T

This study provides evidence on the effect of cyclical unemployment on infant health. We match individual-level data from a detailed survey of mothers and their children in Memphis, TN, with 5-year average census-tract unemployment rates from the American Community Survey. Our findings indicate that a one percentage point increase in the local unemployment rate is associated with a statistically significant increase in the probability of having a low birthweight baby (a baby weighing less than 2500 grams). We also find evidence of a statistically significant decrease in gestational age. These effects are concentrated among infants born to mothers without a college education and into households earning less than $25,000 a year.

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1. Introduction

In recent decades, we have learned more about the degree to which population health is impacted by macroeconomic fluctuations. Stress associated with unemployment has been shown to have a significant negative effect on population health, contributing to depression, suicide, and changes in individual health behaviors such as diet, exercise, and drug use (Blakely et al., 2003; Charles and DeCicca, 2008; Currie et al., 2014; Tefft, 2011; Zimmerman and Katon, 2005). In addition to its importance from a public health perspective, understanding how business cycle fluctuations affect population health is important for the formation of macroeconomic policy. Some have argued that the impact of cyclical unemployment on population health may, in and of itself, justify the role of the government in utilizing counter-cyclical fiscal and monetary policy to attempt to reduce business cycle fluctuations (Stewart, 2001).

It is well understood that stress during pregnancy has an adverse impact on infant health and is typically associated with shorter gestation and low birthweight (for review see Graignic-Philippe et al., 2014). Infant health is of particular interest due to the relatively large and lasting impact it has on individual wellbeing. Studies of identical twins have shown that birthweight impacts growth, educational attainment, IQ, income, and life expectancy (Oreopoulos et al., 2008; Black et al., 2007; Royer, 2009). A recent study by Figlio et al. (2014) provides convincing evidence that birthweight is linked to cognitive development. There is also evidence that there may be an intergenerational impact (Currie and Moretti, 2007). In other words, children with lower birthweight not only have worse outcomes, but they are more likely to have children with low birthweight. Despite the clear link between macroeconomic fluctuations and population health, there is limited evidence on the impact of cyclical unemployment on infant health. Because existing studies on the subject have relied heavily on aggregate-level birth data and have yielded inconsistent results, the topic warrants further investigation (Zilko, 2010).

In this study we use a cross-section of data from a detailed longitudinal study of maternal and infant health, which enrolled 1,503 healthy pregnant women from Shelby County, TN between 2006 and 2011. The enrollment period of this survey coincided with increasing unemployment rates following the 2008 financial crisis. According to data from the Bureau of Labor Statistics, the national unemployment rate increased over the course of 2008 and 2009 from 5.0% to 10.0%, the highest it had been since 1983[1]. Combining detailed individual-level data with newly available 5-year average census-tract unemployment rates from the American Community Survey (ACS) enables us to estimate the impact of

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[1] Data available at http://www.bls.gov/cps/.

cyclical unemployment on infant health using both spatial and temporal variation in the unemployment rate following the financial crisis. The individual-level data allows us to control for a variety of important demographic and maternal health characteristics and behaviors. Additionally, we are able to examine potential heterogeneous effects across different segments of the population based on characteristics such as income and education level.

Our findings indicate that a one point increase in the local unemployment rate is associated with an increase in the probability of having a low birthweight baby—a baby weighing less than 2500 grams—by about 1 percentage point. We also find significant effects when examining gestational age: a one point unemployment rate increase is associated with a decrease in gestational age of 0.65 weeks. Importantly, these effects are concentrated among children born into low education, low income households. We also find limited evidence that increases in the local unemployment rate may affect the probability of having a male child. These findings support a growing literature on the indirect effects of high unemployment rates (Ferrie, 2001; Burgard et al., 2009).

2. Literature

Zilko (2010) provides a review of the literature on the relationship between cyclical unemployment and birth outcomes. The majority of studies within this literature use aggregate time-series data to estimate the relationship between economic contraction and birthweight (Bremberg, 2003; Catalano and Serxner, 1992; Catalano et al., 1999; Dehejia and Lleras-Muney, 2004; Fisher et al., 1985; Joyce, 1990; Joyce and Mocan, 1993). The advantage of using aggregate-level data is that it provides a population-wide estimate of changes in birth outcomes over time. However, there are several drawbacks. First, the inability to control for changing maternal characteristics over time, makes identification of the causal impact of unemployment on birth outcomes difficult. Second, it is not possible to examine the impact of unemployment on potentially vulnerable sub-groups within the population, such as low income households. Zilko (2010) concludes that based on the contradictory findings of these studies, the relationship between unemployment and infant health outcomes remains speculative and that more individual-level studies are needed.

To our knowledge there exists just one study that utilizes individual-level data to examine the relationship between unemployment and birth outcomes. Dooley and Prause (2005) use data from the National Longitudinal Survey of Youth 1979 to estimate the impact of becoming unemployed during pregnancy between 1981 and 1994. Their results indicate that among women who were employed prior to pregnancy, those who became unemployed or underemployed during pregnancy had children with significantly lower birthweight compared to the children of women who retained adequate employment during pregnancy. An important limitation of this study is that the sample includes only women who were employed prior to pregnancy, and women who retained employment during pregnancy are used as a comparison group. The underlying assumption is that both women who are unemployed prior to pregnancy and women who retain employment during pregnancy are unaffected by changes in unemployment rates. There are two reasons to believe that this assumption is false. First, women who are unemployed prior to pregnancy may also suffer stress associated with continued unemployment during pregnancy. Second, women who retain employment during pregnancy may suffer stress during times of high unemployment due to a decrease in perceived job security, or due to loss of employment of a partner, friend, or other family member.

Maternal stress has also been shown to impact in-utero sex selection. In addition to three studies that demonstrate a significant relationship between the secondary sex ratio and economic contraction (Catalano, 2003; Catalano and Bruckner, 2005; Helle et al., 2009), a series of papers by Catalano and colleagues present evidence on this relationship from California, using variation in aggregate unemployment from 1989 to 2001 as well as mass-layoff unemployment insurance claims from 1995 to 2007 (Catalano et al., 2005, 2010, 2012a, 2012b). Additionally, Cotet-Grecu (2016) uses exogenous variation created by exposure to tornadoes to explore the effects of maternal stress on sex ratios. The results of these analyses support the hypothesis that stress related to unemployment contributes to in utero selection against small or otherwise weaker male fetuses. The observable consequence is a lower than expected secondary sex ratio during times of high unemployment, resulting in better than expected health among surviving male babies. There is some evidence that this increase in population health persists, resulting in higher life expectancy among males born in periods with low male to female sex ratios (Catalano and Bruckner, 2006).

This study contributes to the existing literature in several ways. First, by combining a detailed individual-level dataset of mothers and infants with local unemployment rates, we gain insight into the impact of ambient stress associated with high unemployment rates while taking advantage of the precision offered by individual-level data. Second, detailed individual level-data allows us to examine distributional impacts of cyclical unemployment in addition to population averages. Finally, we offer new evidence on the relationship between cyclical unemployment, birthweight, and secondary sex ratios during the most recent economic downturn.

3. A simple theoretical framework

For the purposes of this study we will simplify the comprehensive theoretical framework developed by Zilko (2010) to illustrate the two primary pathways by which economic contraction might impact birth outcomes. Consider the following simple model:

$$y = f(u_D, u_I, x), \tag{1}$$

which explains birth outcome, y, as a function of two different unemployment measures, represented by u_D and u_I, as well as other individual and household characteristics, represented by x. Birth outcomes include infant health outcomes such as birthweight and gestational age.

The model contains two avenues through which unemployment can impact birth outcomes: a direct effect and an indirect effect. The variable u_D captures the direct impact of unemployment, characterized by a loss of employment or decrease in wage for either the mother or another adult in the household, which leads to a decrease in household resources. The other potential unemployment effect is the indirect unemployment impact, which is captured by u_I. This indirect impact may manifest itself through (a) a decrease in perceived job security, (b) a loss of employment for a friend or family member outside of the household, or (c) a decrease in available community resources. Perceived job insecurity has been shown to be associated with declines in both physical and mental health (Ferrie, 2001; Burgard et al., 2009).

As indicated by Zilko (2010) either of these direct or indirect effects may impact birth outcomes through a variety of channels, including changes in fertility choices, severe psychological stress, or changes in behavior such as alcohol or tobacco use, diet and exercise, or prenatal care utilization. In this paper we will focus on estimating the overall impact of unemployment on birth outcomes. However, future work might focus on examining the channels by which this exposure affects birth outcomes.