Long-term Impacts of Short-term Fluctuations

Hannes Schwandt
Northwestern University &
Stanford Institute for Economic Policy Research

Till von Wachter
University of California Los Angeles & NBER

Federal Reserve Bank of Minneapolis, April 10, 2019


Developing a methodology that allows to
- harness power of large cross-sectional data sources (CPS/Census/VitalStats/...)
- spanning a long period of time (1976-2016)
Introduction

- Business cycle fluctuations are temporary

- But potential long-term impacts on young adults entering the labor market

Introduction

- Business cycle fluctuations are temporary
- But potential long-term impacts on young adults entering the labor market

Three main contributions today

1. Broaden analysis to less advantaged labor market entrants
2. Analyze mortality
3. Look at impacts in middle age and beyond

Hannes Schwandt (Northwestern/SIEPR)
Summary of core take-aways

1. Less-advantaged workers suffer larger earnings and employment losses than college graduates
The Economist’s version of our results – “Figure of the Day”

Strokes of bad luck
United States, effect of a one percentage-point increase in the unemployment rate on entry-level earnings
1976-2015, %

Gender
- Male
- Female

Race
- Non-white
- White

Education, years
- 16+
- 13-15
- Less than 12

Years since graduation

Source: “Unlucky Cohorts”, by Hannes Schwandt and Till M. von Wachter, NBER working paper, 2018
The Economist
Summary of core take-aways

1. Less-advantaged workers suffer larger earnings and employment losses than college graduates

2. Positive and increasing impacts on mortality after age 35
Effect on deaths per 10,000

Age

Hannes Schwandt (Northwestern/SIEPR)
Summary of core take-aways

1. Less-advantaged workers suffer larger earnings and employment losses than college graduates

2. Positive and increasing impacts on mortality after age 35

3. Negative wage effects reappear in midlife, along with adverse family formation and fertility outcomes
Effect on log earnings

Age

Log of wage and salary income

Hannes Schwandt (Northwestern/SIEPR)

Long-term Impacts

10 April 2019 7 / 18
Empirical approach
The ideal regression

\[ \text{outcome}_{i,t} = \alpha + \beta_e u_{i,g} + \gamma_e + \delta_s + \lambda_g + \theta_t + \epsilon_{s,t} \]

- with \( u_{i,g} \) unemployment rate at labor market entry
- Estimating profile by years of experience \( e \) (or age \( a \))
The ideal regression

\[ outcome_{i,t} = \alpha + \beta_e u_{s,g} + \gamma_e + \delta_s + \lambda_g + \theta_t + \epsilon_{s,t} \]

- with \( u_{i,g} \) unemployment rate at labor market entry

- Estimating profile by years of experience \( e \) (or age \( a \))

- Two problems in cross-sectional data:
  1. Measurement: Year and state of labor market entry unknown
  2. Selection: Year and state of labor market entry endogenous
Mincerian approach in CPS data

\[ \text{outcome}_{i,t} = \alpha + \beta_{e} u_{r,g}^{\text{minc}} + \gamma_{e} + \delta_{r} + \lambda_{g} + \theta_{t} + \epsilon_{i,t} \]

- “Mincerian” year of graduation: yob + 6 + years of education
- State of residence \( r \) as proxy for state of graduation
Mincerian approach in CPS data

\[
outcome_{i,t} = \alpha + \beta_1 yob_{t-6} + \beta_2 \text{minc} + \beta_3 e + \delta_r + \lambda_g + \theta_t + \epsilon_{i,t}
\]

- “Mincerian” year of graduation: yob + 6 + years of education
- State of residence \( r \) as proxy for state of graduation
- Potentially poor proxy, especially at older ages
- Endogeneity not solved

Hannes Schwandt (Northwestern/SIEPR)
Double-weighted approach in Census/ACS/VitalStats

\[ \text{outcome}_{i,t} = \alpha + \beta_a u_{b,c}^{DW} + \gamma_a + \delta_b + \lambda_c + \theta_t + \epsilon_{i,t} \]

- Dividing population into cohorts by state and year of birth
- “Double-weighted” average graduation year u-rate, using cohort specific migration and educational attainment as weights

\[ u_{b,c}^{DW} = \sum_{A=16}^{22} edu_A u_{b,c}^{A} \sum_{s=1}^{50} mig_{b,s} u_{s,c+A} \]
Double-weighted approach in Census/ACS/VitalStats

\[ \text{outcome}_{i,t} = \alpha + \beta_a u_{b,c}^{DW} + \gamma_a + \delta_b + \lambda_c + \theta_t + \epsilon_{i,t} \]

- Dividing population into cohorts by state and year of birth

- “Double-weighted” average graduation year u-rate, using cohort specific migration and educational attainment as weights

\[ u_{b,c}^{DW} = \sum_{A=16}^{22} \text{edu}_{b,c}^A \sum_{s=1}^{50} \text{mig}_{b,s}^A u_{s,c+A} \]

- Compare Mincerian to double-weighted approach in Census/ACS
Effect on log earnings

Years since Graduation [Age]

CPS, Mincerian (baseline) Census, Mincerian Census, using state of birth Census, Double-Weighted [by age]

Hannes Schwandt (Northwestern/SIEPR)
CPS results
Earnings and household income

- <12 years of schooling
- 12 years of schooling
- 13–15 years of schooling
- 16+ years of schooling

Effect on log income

Years since Graduation

Earnings Household Income

Hannes Schwandt (Northwestern/SIEPR)
Welfare support

![Graphs showing the effect of welfare support on various educational levels over time.](image)}

1. **<12 years of schooling**
2. **12 years of schooling**
3. **13–15 years of schooling**
4. **16+ years of schooling**

- **Medicaid**
- **Foodstamps**

Hannes Schwandt (Northwestern/SIEPR)
Vital Stats mortality results

\[ \text{mortality}_{i,t} = \alpha + \beta_a u_{b,c}^{DW} + \gamma_a + \delta_b + \lambda_c + \theta_t + \epsilon_{i,t} \]
Graphs showing the effect on deaths/10,000 across different ages for accidents, suicides, drug poisoning, and deaths of despair.
ACS/Census/CPS results up to age 50
Impacts in middle age

- In midlife, recession graduates
  - earn less (-1% vs. -3% initially)
  - work more (+0.2pp vs. -0.6pp initially)
  - are more divorced (+1.5%)
  - have fewer children (-1%)
  - and receive less welfare support (-6% vs. +15% initially)
Consequences of adverse labor market entry

1. Negative earnings effects stronger for less-advantaged groups, only partly offset by welfare benefits

2. Mortality impacts after age 35

3. Broad deterioration of labor market and family outcomes in midlife
Consequences of adverse labor market entry

1. Negative earnings effects stronger for less-advantaged groups, only partly offset by welfare benefits

2. Mortality impacts after age 35

3. Broad deterioration of labor market and family outcomes in midlife

⇒ Temporary economic fluctuations have permanent effects on both economic and life trajectories of labor market entrants
Data

- Census / ACS: State of birth, years of education
- CPS: State of residence, years of education
- Unemployment rates: BLS, 1976+ state-level
Contribution to literature

- Conditions at labor market entry

- Midlife mortality / deaths of despair
Poverty by gender and race

Effect on fraction poor

Years since Graduation

Male Female

White Non-white
Effect on log earnings

Effect on perc. earnings > 0

Effect on perc. welfare income

Effect on perc. divorced
Short- and long-term effects of unemployment on fertility
Janet Currie1 and Hannes Schwandt
Center for Health and Wellbeing, Princeton University, Princeton, NJ 08540
Edited by Kenneth W. Wachter, University of California, Berkeley, CA, and approved September 3, 2014 (received for review May 14, 2014)

Scholars have been examining the relationship between fertility and unemployment for more than a century. Most studies find that fertility falls with unemployment in the short run, but it is not known whether these negative effects persist, because women simply may postpone childbearing to better economic times. Using more than 140 million US birth records for the period 1975–2010, we analyze both the short- and long-run effects of unemployment on fertility. We follow fixed cohorts of US-born women defined by their own state and year of birth, and relate their fertility to the unemployment rate experienced by each cohort at different ages. We focus on conceptions that result in a live birth. We find that women in their early 20s are most affected by high unemployment rates in the short run and that the negative effects on fertility grow over time. A one percentage point increase in the average unemployment rate experienced between the ages of 20 and 24 reduces the short-run fertility of women in this age range by six concep tions per 1,000 women. When we follow these women to age 40, we find that a one percentage point increase in the unemployment rate experienced at ages 20–24 leads to an overall loss of 14.2 conceptions. This long-run effect is driven largely by women who remain childless and thus do not have either first births or higher-order births.

Demographers have been examining the effect of economic conditions on fertility for more than a century (1–10). Although some find that fertility is procyclical (8–10), most studies find procyclical fertility; that is, fertility declines in times of rising unemployment (1–7). These fertility reductions may represent a short-run effect (i.e., a one-time effect) or persistent long-term effects on completed fertility, i.e., on the number of children a woman ever bears (a quantum effect).

Our birth data come from the US Vital Statistics natality data, and include ~140 million individual birth records for all births in the United States from 1975 and 2010. These records provide information about the state and date of the child’s birth, gestation length, the age of the mother, and the mother’s own state of birth. In our sample of all live births to US-born women over this period, we focus on the year of conception rather than on the year of birth, because economic conditions at the time of conception likely are more relevant to the decision to have a child. We also treat multiple births as a single conception (i.e., a single fertility choice). Thus, we are counting conceptions that resulted in a live birth. Cohorts are defined using the mother’s own state and year of birth. To obtain rates, we divide conception counts by population estimates that also are constructed at the level of women’s state and year of birth using data from the decennial US Census.

State-level unemployment rates are merged to cohorts’ conception rates at the annual level. Most of our estimates use the weighted average of the unemployment rates in all states in which a cohort gave birth in a given year, with the number of births in each state as weights. Because the number of cohort members giving birth in each state may not be in proportion to the number of cohort members living in each state, we use census data to check on the extent to which the spatial distribution of births reflects a cohort’s overall migration behavior.

Another issue is endogenous migration. Because prospective mothers might migrate to states with lower unemployment rates, using the actual locations of cohort members might cause fertility to appear more procyclical than it actually is. An alternative is to use the unemployment rate in the mother’s own state of birth.
# Long-run Effects on Percent Childless Women

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Percent childless women at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>age 40 (1)</td>
</tr>
<tr>
<td>Effect of average unemployment rate at</td>
<td></td>
</tr>
<tr>
<td>Age 15-19</td>
<td>0.34 (0.25)</td>
</tr>
<tr>
<td>Age 20-24</td>
<td>0.51** (0.20)</td>
</tr>
<tr>
<td>Age 25-29</td>
<td>-0.06 (0.33)</td>
</tr>
<tr>
<td>Age 30-34</td>
<td>0.27 (0.54)</td>
</tr>
<tr>
<td>Age 35-39</td>
<td>-0.01 (0.46)</td>
</tr>
<tr>
<td>N</td>
<td>510</td>
</tr>
<tr>
<td>Mean dep. var.</td>
<td>18.44</td>
</tr>
</tbody>
</table>

Notes: Coefficients from OLS regressions of the percent of childless women on the average unemployment rate at different periods of women's fertile lifecycles are displayed. See notes under Table 2 for further comments. Significance levels: *

*p<0.1, ** p<0.5; *** p<0.01.