

The Post-2007 Declining U.S. Birth Rates imply Significant Societal Shifts in the U.S.*

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This paper explores several potential explanatory factors for the steep decline in birth rates in the United States between 2007 and 2020. The decline in U.S. birthrates offers some significant insights into U.S. society. Changes in birth patterns among recent young adult women moving through the childbearing age group can be directly related to the decline in birth rate from a purely statistical standpoint. We provide evidence that the steep drop in birth rates could be attributed to recent young adults' shifting interests. These shifting priorities represent changes in young adults' preferences regarding having children and aspirations for life. Resonating with the original paper, we conclude with a brief discussion of the implications of the declining birth rate in the United States and its impact on society as an entirety.

1 Introduction

To measure birth rates, the National Center for Health Statistics (NCHS) aggregates data on birth rates for women by age, race, education level, and other factors; the aggregated data for a particular year is the total number of births per 1000 women. Each year NCHS measures birth rates nationwide and analyzes the data to make insights into societal phenomena. For instance, in 1997, NCHS published a paper on how a mother's education level influences the birth rate. In the paper, NCHS asserted that there is a negative correlation between a mother's education level and birth rate. Their study found a direct relationship between years of education and birth rates, with the highest birth rates among women with the lowest educational attainment "1997 Fact Sheet - Mothers Education and Birth Rate" (1997).

In this paper, we gathered data from the American Economic Association, National Center for Health Statistics, and the U.S. population data. With gathered data, we generated graphs and

*Code and data are available at: <https://github.com/UtopianYoungChung/Paper2.git>

tables to observe the trend in birth rates of different demographics, using R (R Core Team 2020). We also uploaded and cleaned data using R (R Core Team 2020), tidyr (Wickham 2021), dplyr (Wickham et al. 2021), tidyverse (Wickham et al. 2019), and haven (Wickham and Miller 2021) packages. Figures and tables were created with knitr (Xie 2014), ggplot2 (Wickham 2016), kableExtra (Zhu 2021), and dplyr (Wickham et al. 2021).

Figure 1 depicts U.S. birth rate trends over the last 40 years. In Figure 1, we can see that the trend is fluctuating relatively stable. However, during the post-2007 recession, it takes a steep decline with no sign of turning back.

In Section 4.1, we discuss how decomposing the decline in the birth rate between demographic groups helps us to have a clearer picture of the topic. As can be seen in ?@fig-2 and ?@fig-3

Section 4.2, briefly discusses the empirical relationship between birth rates and economics and policy factors. We then argue that other economic, policy or social factors that have changed since 2007 do not contribute much to the decline.

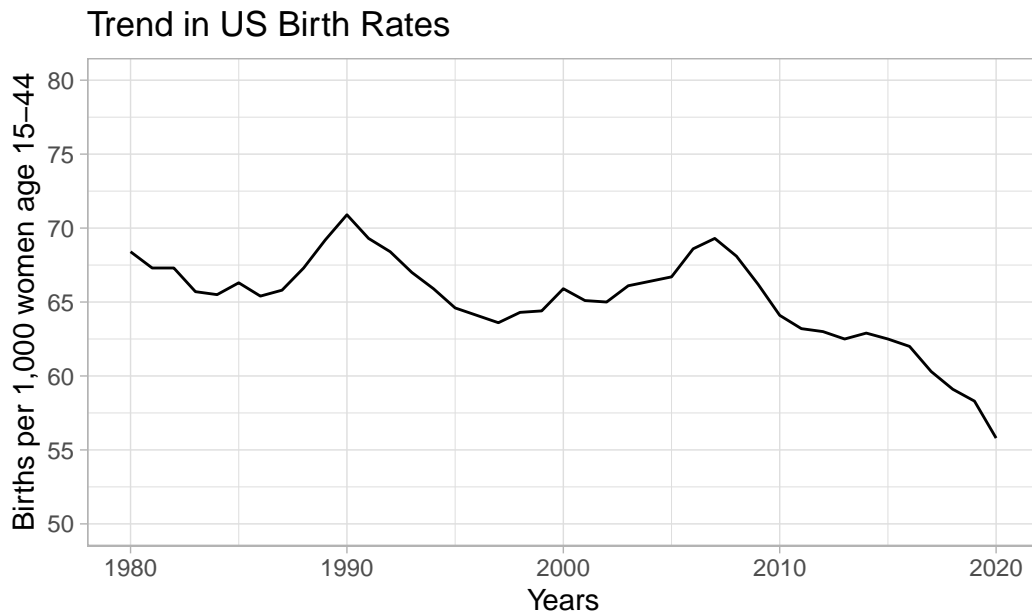
Section 4.3, presents a potential attributing factor for the declining U.S. birth rate after the 2007 recession. We show strong evidence that suggests the most recent group of young adults is a significant driver of the post-2007 decline in the birth rate. This significance suggests that the societal shifts among young women moving through childbearing age are an ongoing trend.

We conclude the paper by raising a concern that this societal phenomenon imposes some severe societal consequences and, therefore, should be considered at a high level. Most importantly, we need to consider what it means for the nation's well-being when there are no signs of returning from the negative trend in birth rates.

2 Data

3 Results

Figure 1. Trends in US birth rates over the past 40 years show a steep decline in the birth rate during the post-2007 recession (Figure 1).



Source: Birth Rates collected from CDC Vital Statistics Births Reports for 2015, 2019 and 2020.

Figure 1: Trends in U.S. Birth rates of 1000 women between age 14 to 44 from 1980 to 2020

Figure 2.place it here with Figure 6 (?@fig-2).

Figure 3. place it here with Figure 7 (?@fig-3).

Figure 4. place it here with the Figure 4 from the Original paper (?@fig-4).

Figure 5. place it here with the Figure 2-a from the Original paper (Figure 2).

Figure 6. Children Ever Born by Mother's Age and Birth Cohort (Figure 3).

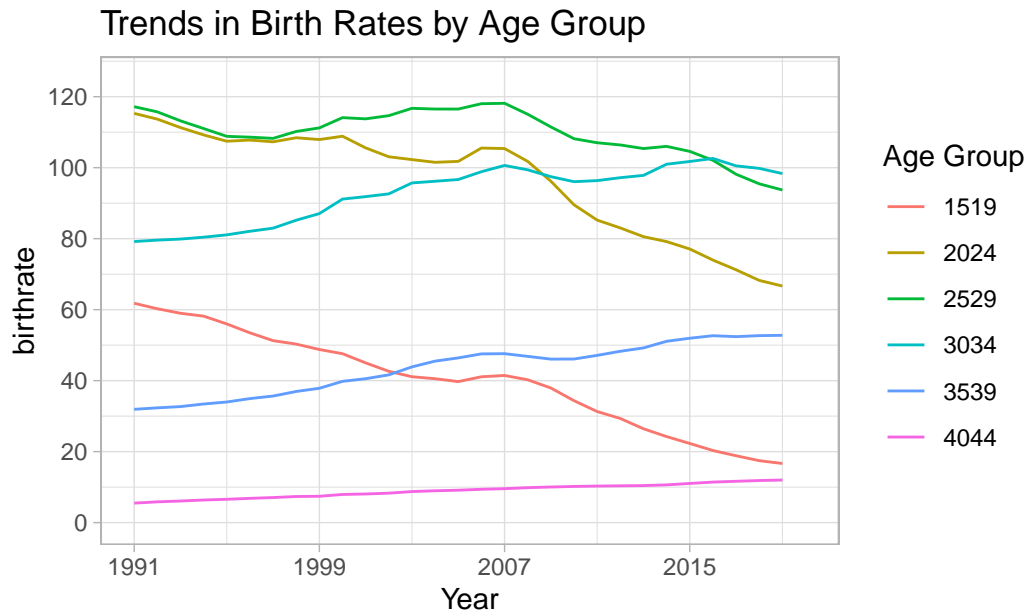


Figure 2: Relationship between Changes in Birth Rates 2004-2008 to 2014-2019

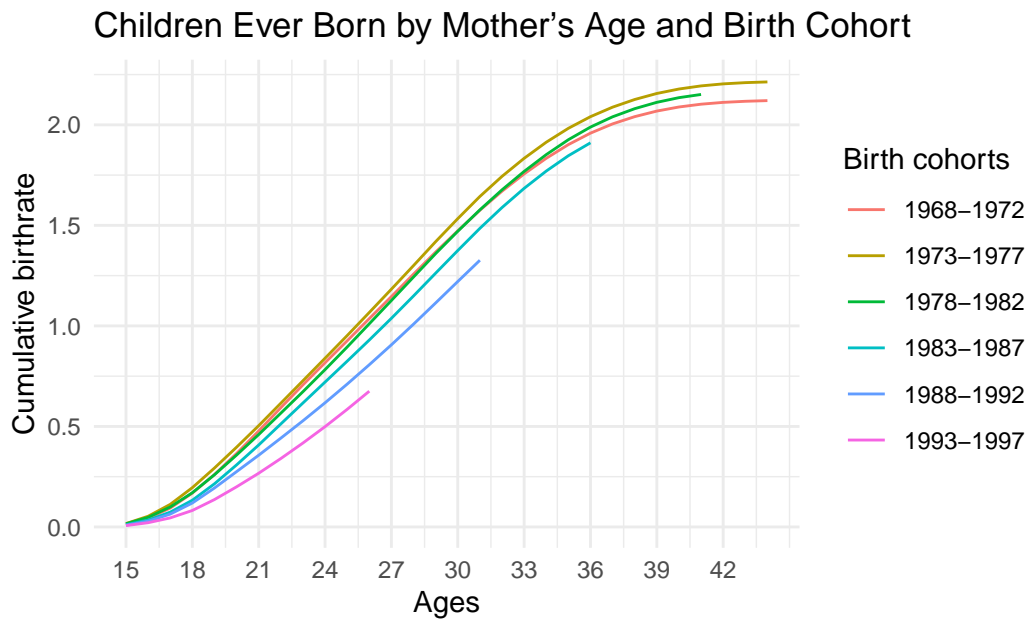


Figure 3: Children Ever Born by Mother's Age and Birth Cohort

4 Discussion

4.1 Birth Rates by Demographic Groups

4.2 Economic and Policy Factors

4.3 A Potential Explanation: Shifting Priorities

4.4 Weaknesses and next steps

Appendix

A Additional details

References

- “1997 Fact Sheet - Mothers Education and Birth Rate.” 1997. *National Center for Health Statistics*. <https://www.cdc.gov/nchs/>.
- R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.org>.
- . 2021. *Tidyr: Tidy Messy Data*.
- Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D’Agostino McGowan, Romain François, Garrett Golemund, et al. 2019. “Welcome to the tidyverse.” *Journal of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.
- Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2021. *Dplyr: A Grammar of Data Manipulation*.
- Wickham, Hadley, and Evan Miller. 2021. *Haven: Import and Export ‘SPSS’, ‘Stata’ and ‘SAS’ Files*.
- Xie, Yihui. 2014. “Knitr: A Comprehensive Tool for Reproducible Research in R.” In *Implementing Reproducible Computational Research*, edited by Victoria Stodden, Friedrich Leisch, and Roger D. Peng. Chapman; Hall/CRC. <http://www.crcpress.com/product/isbn/9781466561595>.
- Zhu, Hao. 2021. *kableExtra: Construct Complex Table with ‘Kable’ and Pipe Syntax*.