A Deeper Analysis into the Trends and Factors of the US's Declining Birth Rates*

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Over the last couple of years, the American population has been witnessing a steady decline in their birth rates, as suggested by (Kearney, Levine, and Pardue 2022)'s data from the American Economic Association. Through the analysis of multiple different factors, such as age and education, we notice a continual decline in birth rate starting from the year 2007. We explore how different social, cultural, and economic effects play a part in this worrying trend. This report sheds light on how the societal trends in the recent years have affected the American citizens in the last few decades, and how these patterns have played a part in this downward trend as people adapt to them.

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*Code and data are available at: https://github.com/rex009x/us_birth_rates/tree/master/data. Selected aspects of the original paper that underpins this paper were reproduced and a record of this is available at: https://www.socialsciencereproduction.org/reproductions/bfe97499-4c05-466f-8cb5-fbedc27a83a1/index

1 Introduction

The United States has been experiencing heavy fluctuations in birth rates for nearly half a century with constant decline since 2007. The birth rate of a country is representative of its socioeconomic state, political state, and future prosperity. Furthermore, it determines the decision-making and distribution of government resources, education, health care services, and urban planning. This alarming issue leaves many seeking an explanation as to what exactly is causing this phenomenon. While people may point fingers at the ever changing societal norm, evolving ideology on family structure, or to no fault but the government, this paper aims to expose the possible explanations to the plummeting birth rate in the United States of America.

The nations birth rate has fallen significantly since 2007, dropping but about 23% by 2022, measured by number of births per 1000 women (Alex Fitzpatrick 2023) and that birth rates tend to fall as based on the economy. 2007 marks the start of the most severe economic crisis the world has ever faced, spanning the years 2007 until 2009. The events of this crisis has had long lasting damage on the economy, with unemployment doubling and the crash of the housing market (Weinberg 2013). These poor economic conditions and the unusually slow recovery of the economy would play a large role in the decision to have children, as an unpredictable economic environment makes people feel less secure about raising a family, thus contributing to the recorded decline in birth rates. This is just one of various factors that we will be exploring in this paper to observe any trends and correlations between societal and economic shifts and the dwindling birth rate in the US.

Throughout the rest of this paper, we will be delving into the statistics with regards to birth rates in the US and observe any trends we can find. In the data and results sections of this paper, we examine and analyze the information reported by the AEA by downloading and cleaning the data sets. After that, we will look into the results sections to look for trends and other insights that can be uncovered from our research, and finally discuss and summarize all of our findings in the conclusion.

2 Data

2.1 Data Source and Collection

The datasets for this paper were acquired through the American Economic Association's paper "The Puzzle of Falling US Birth Rates since the Great Recession" (Kearney, Levine, and Pardue 2022), with the aid of data available from Centers for Disease Control, and Prevention (CDC) Natality data (Economic Research 2022) and CDC SEER U.S. Population Data (Disease Control, Prevention, and Sciences 2022). The data sources were accessed on February 12th, 2024 and acts as the foundation of this paper. The data sources themselves are a

collaborative effort including but not limited to the U.S. Census Bureau, the National Cancer Institute, SEER Data, CDC, and the National Center for Health Statistics (NCHS). The United States census is legally mandated by the United States Constitution which occurs every 10 years. The data is largely comprised of `numeric` values representing years, birth rates by race and ethnicity, marital status, education, age, and birth parity, or `character` values representing US states.

All data collection and analysis was done using statistical tools and data visualization program R (R Core Team 2023) and Rstudio IDE (RStudio Team 2020) to help streamline the workflow. The analysis was done using the R program and the following supporting packages `tidyverse` (Wickham et al. 2019), `haven` (Wickham, Miller, and Smith 2023), `ggplot2` (Wickham 2016), `here` (Müller 2020), `ggthemes` (Arnold 2024), and `dplyr` (Wickham et al. 2023). We will provide more comprehensive details about the data cleaning, and analysis in the following subsections.

2.2 Variables of Interest

Although the data contains an abundance of information, we are mainly concerned of US birth rates per year, the total female population, and various other factors including age, mother's level of education, and birth parity (number of children for a given women). As this paper focuses on birth rates in the US over the course of time, we have all the necessary and sufficient information required to proceed processing the data for our analysis.

2.3 Data Processing

2.4 Data Visualization

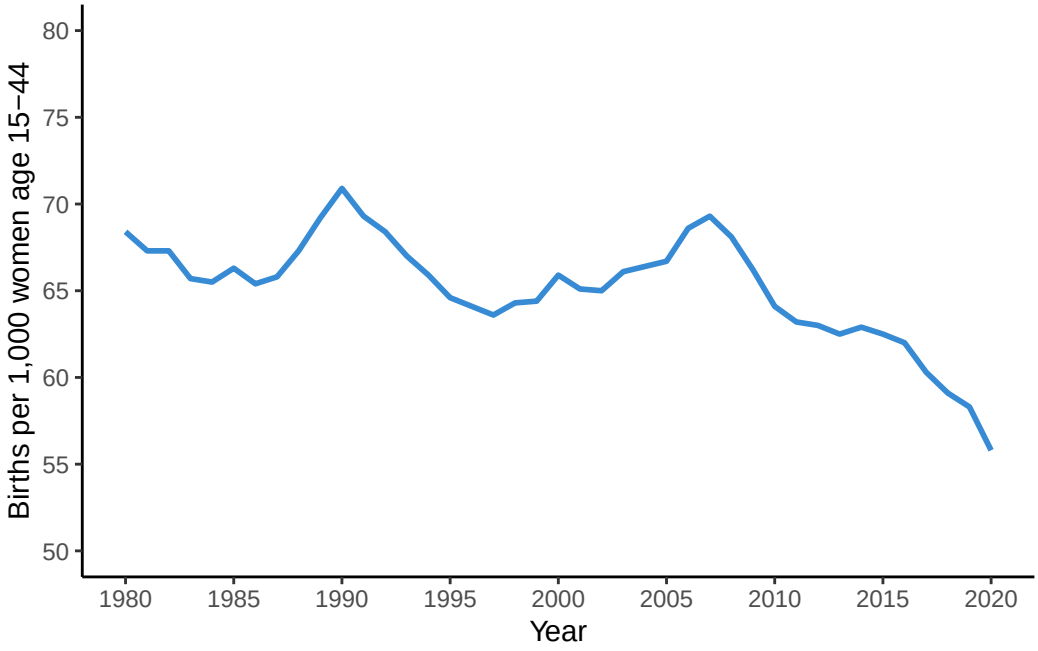

Figure 1: Trend in US Birth Rates from 1980 - 2020

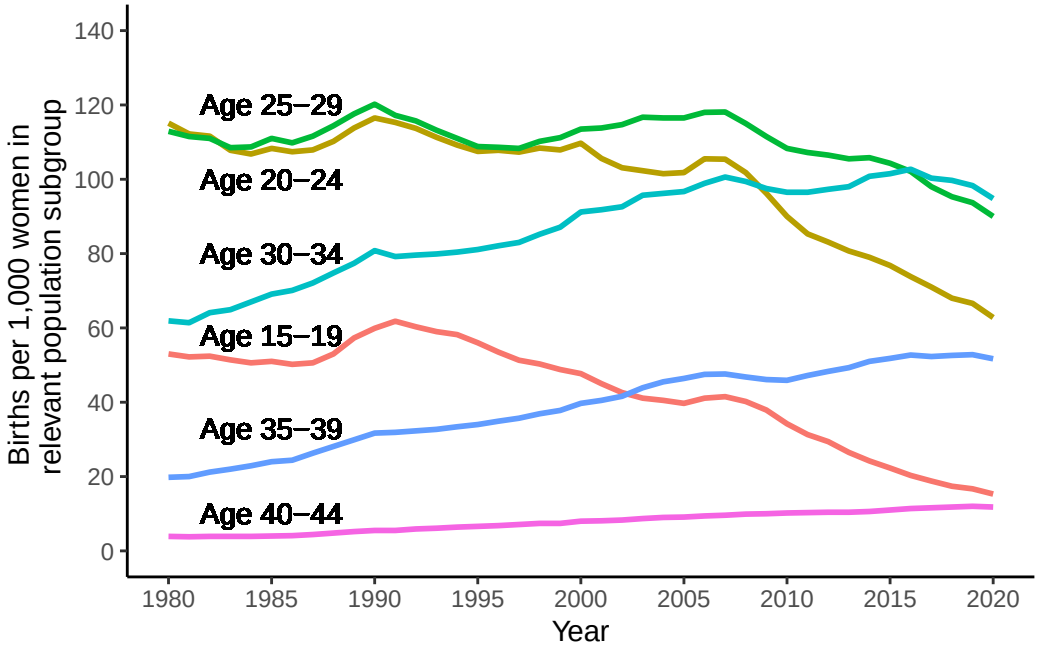

Figure 2: Trends in Birth Rates by Five-year Age Group

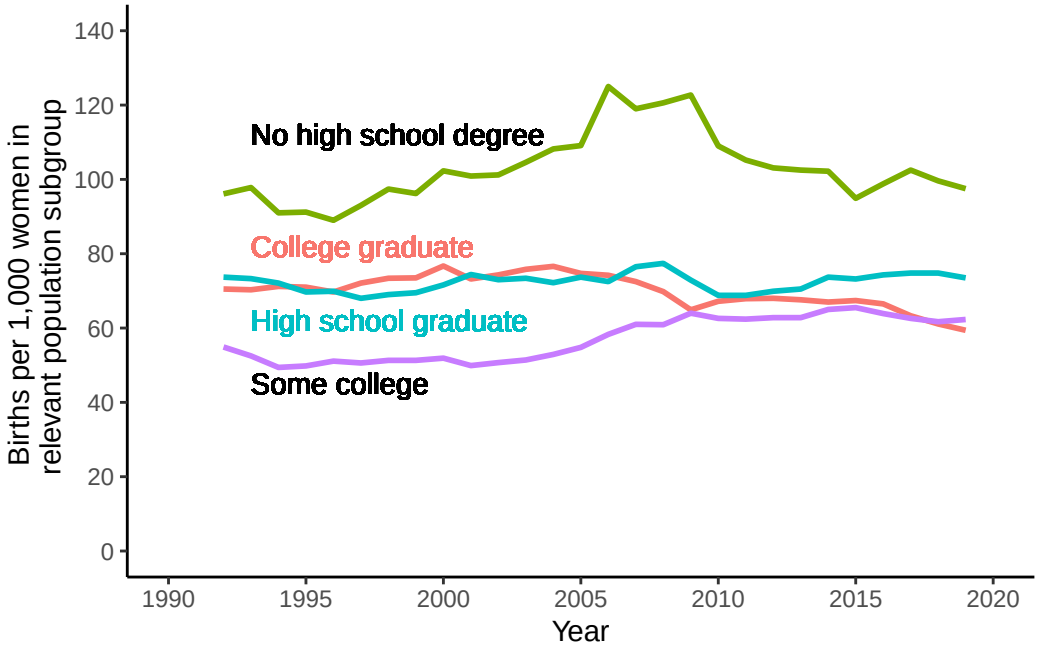

Figure 3: Trends in Birth Rates by Mother's Level of Education (ages 20-44)

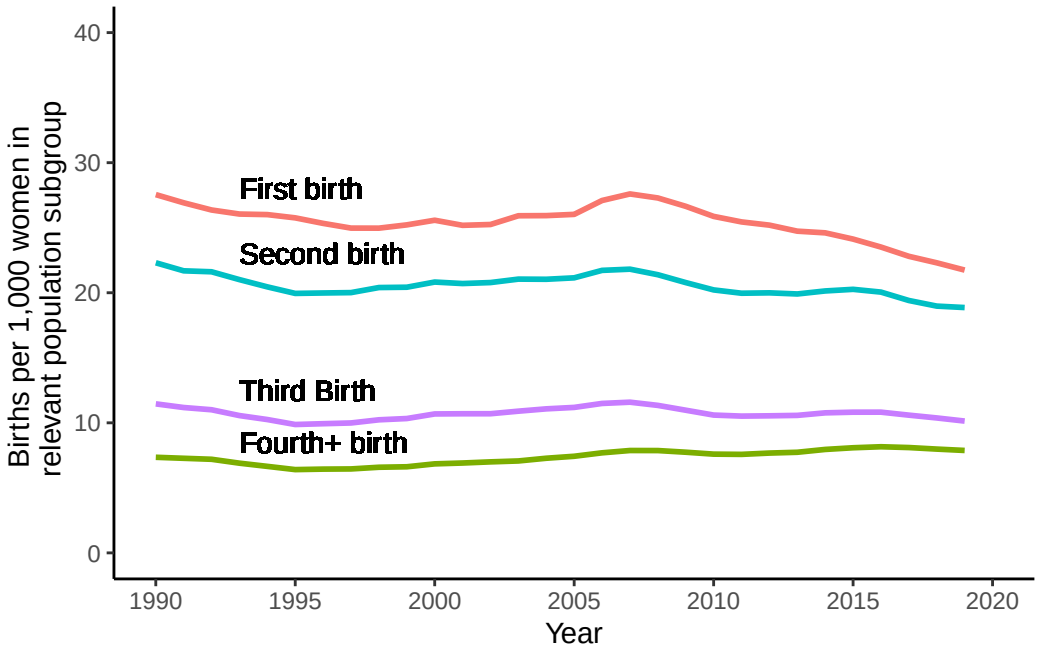

Figure 4: Trends in Birth Rates by Parity (ages 15-44)

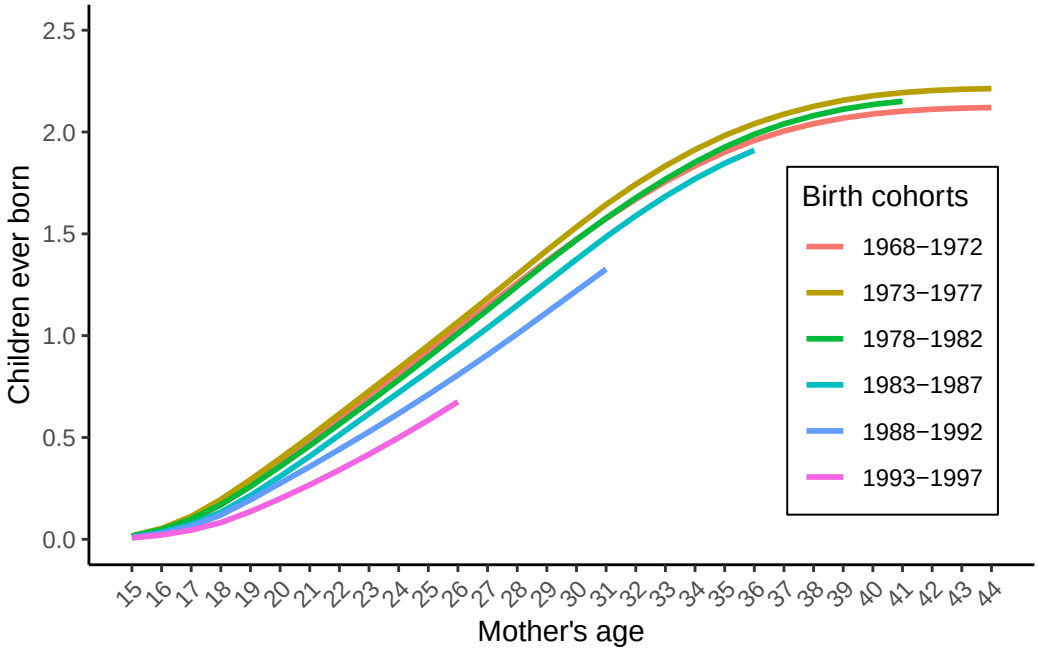

Figure 5: Children Ever Born by Mother's Age and Birth Cohort

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