Public Child Care and Fertility

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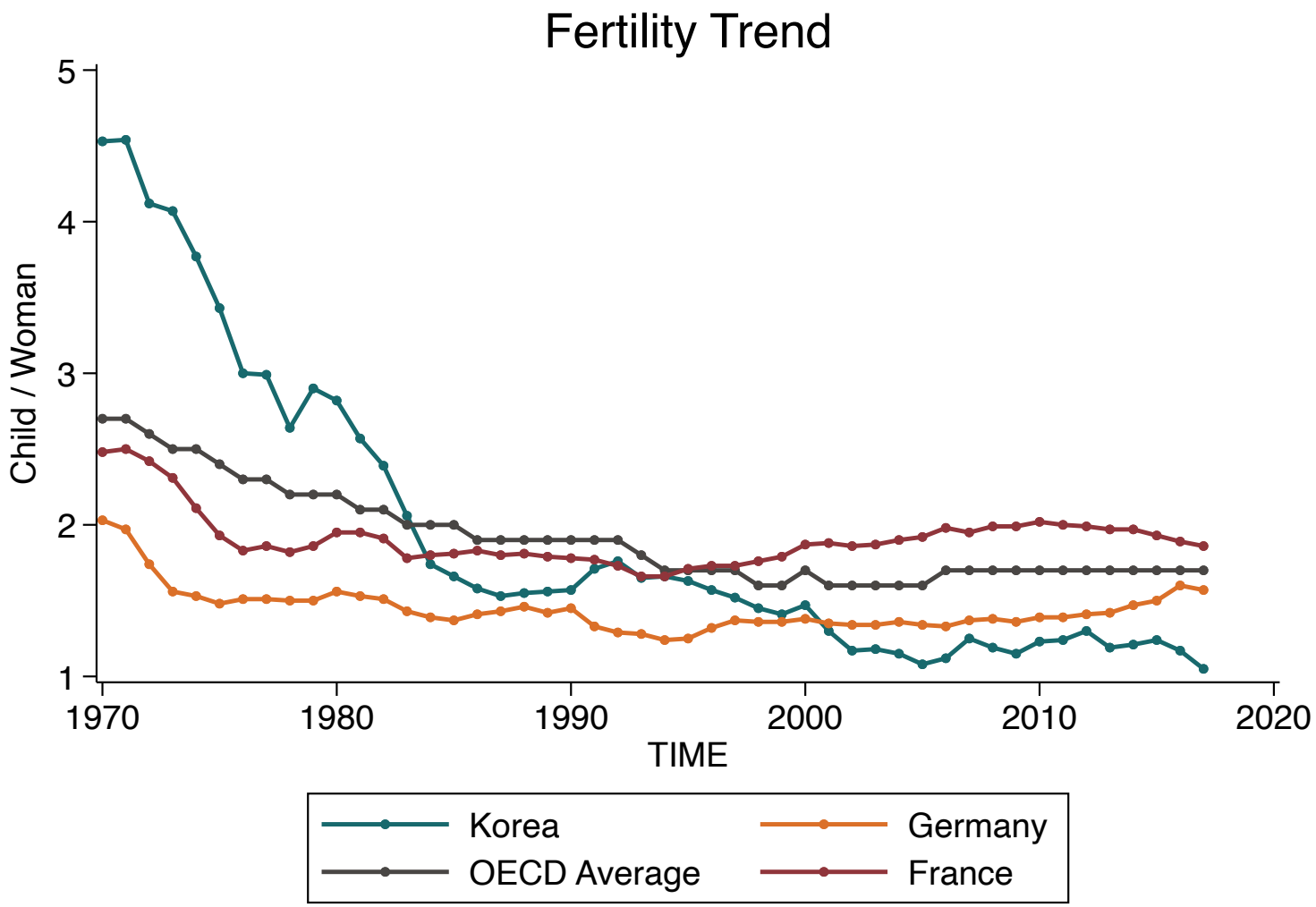
Motivation

- Fertility rates between 1.3 and 1.4 in many developed countries (e.g. Germany, Italy, South Korea, Japan, etc.)
- Low fertility levels below the population replacement rate (i.e. 2.1 children born per woman)
- Burden on young population/ reduction in tax base (e.g. pension plan and health care)
- Controversial issue on whether the pronatalist policies (e.g. public child care provision) are an effective way to increase fertility rates

Motivation


Fertility Trend
Child / Woman
5
4
3
2
1
1970
1980
1990
2000
2010
2020
TIME
Korea
OECD Average
Germany
France

Question

- Does public child care provision increase the fertility rate?
  - Does the effect differ among German women and non-German women?
- Public child care policy reform in Germany

Question

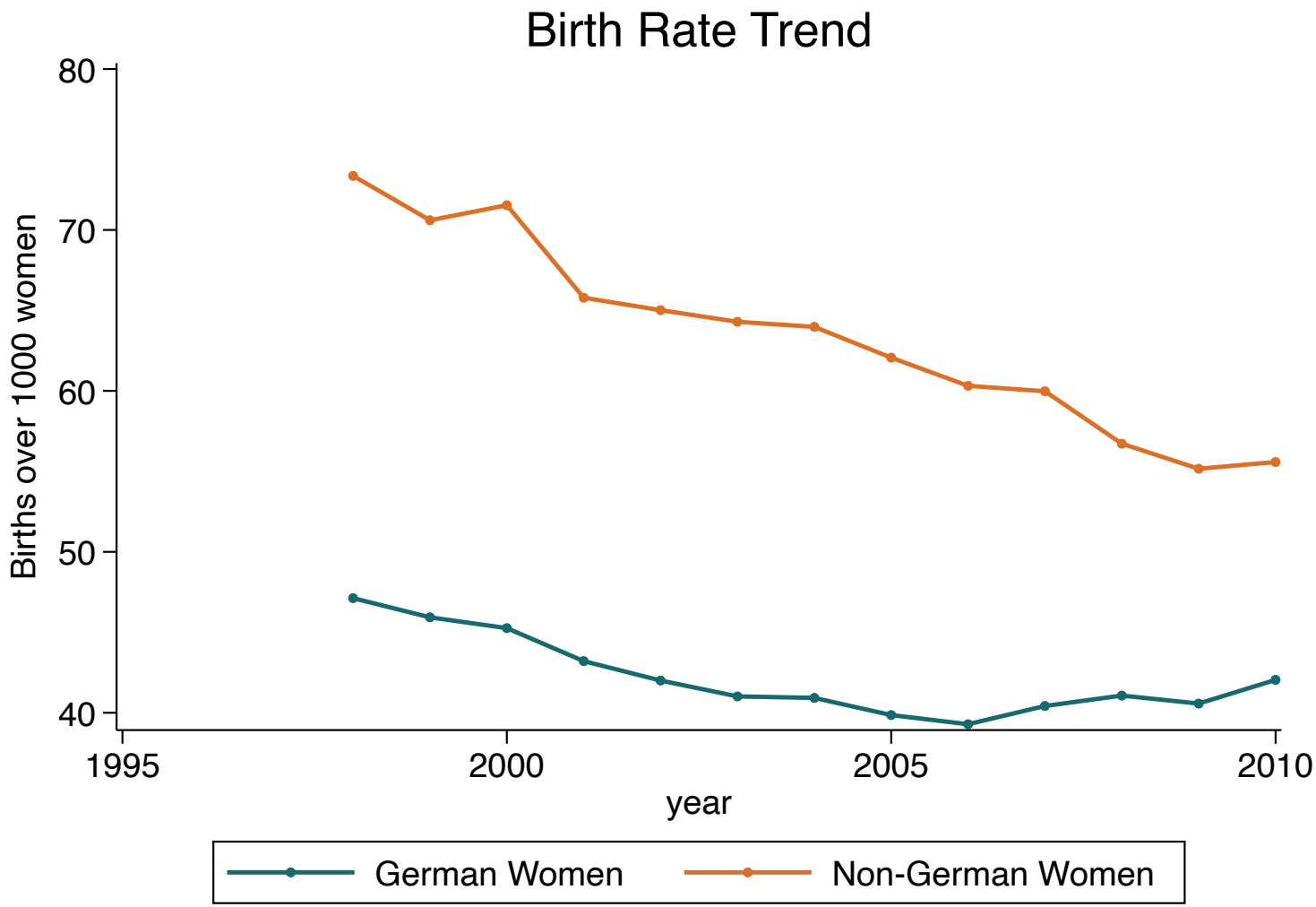


Figure 1: Fertility rate trend of German and Non-German women

Literature

- Bauernschuster et al (2015): Finds positive effect from universal early child care on birth rates in Germany
- Raute (2014): Finds strong effects of financial incentives arising from a reform in parental leave benefits in Germany on fertility
- Milligan (2005): Pronatalist cash transfer policy in the Canadian province of Quebec had a positive effect on fertility
- Cohen et al. (2013): Strong positive effects on fertility using variation in Israel's child subsidy

Background

- Three major pronatalist policies
  - tax credit (per child subsidy)
  - child care subsidy (or public provision)
  - parental leave benefit
- In 1996, German Government enacted legislation that granted children from 3 to 6 the right to a place in a public kindergarten
- Until the mid-2000s, public child care for children under the age of three was virtually non-existent in West Germany
- The Government implemented public child care reforms during the period 2005-2008

Background

Table 1: Public child care reforms in West Germany

2005	child care coverage rate of 17%,by 2010 (for children under three years old)
2007	child care coverage rate of 35%,by 2013 (for children under three years old)
2008	child care slot for ALL preschool children aged one and above by 2013

Note: More than half of all children under the age of three and almost all children between three to six were guaranteed for public child care slots in East Germany.

Background

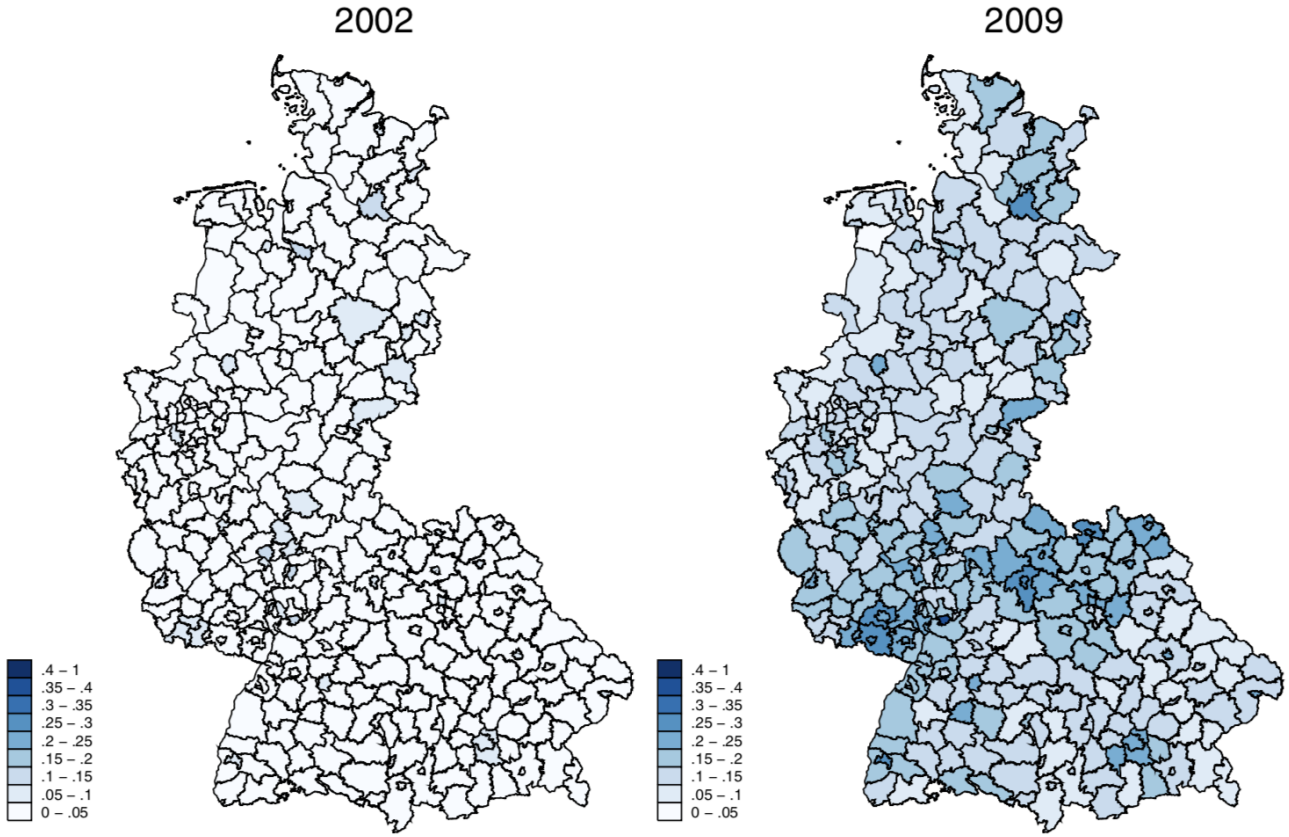


Figure 2: Public child care coverage in West German counties in 2002 and 2009

Background

- Counties differ distinctly in the magnitude of public child care expansion
- In 2009, the public child care coverage rates vary from 3.7% to 35.9%
- Variation comes from the administrative process that varied substantially across counties
- Growth of child care slots differed due to shocks to the local supply of new child care slots. Orthogonal to expected changes in fertility rate (i.e. *identification strategy*)

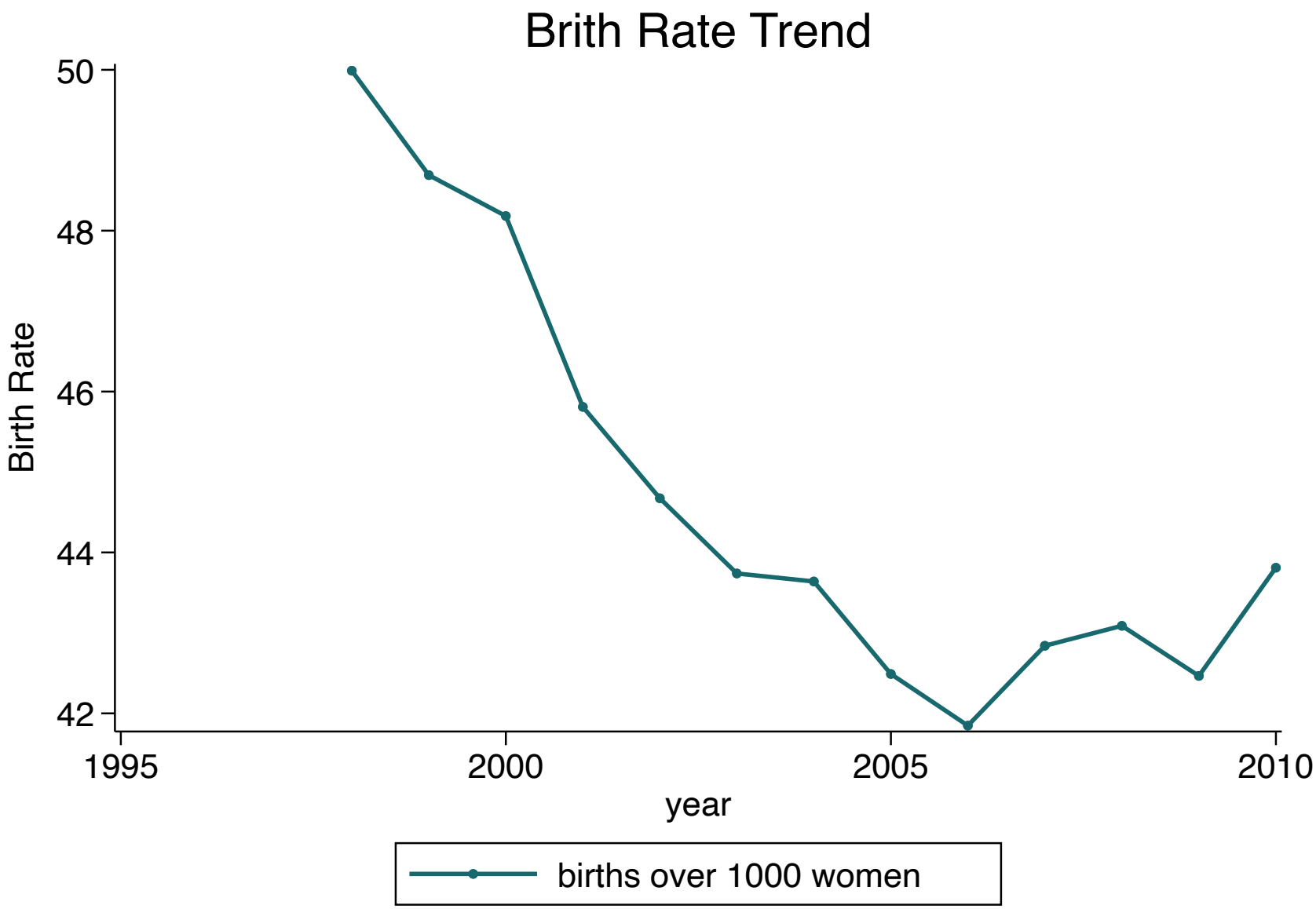
Data

- Data from Statistical Offices of the German Lander on public child care for children under the age of three
- Public child care coverage
$$= \frac{\text{Public child care slots}_{\text{ March of } t}}{\text{Population of children under three years old}_{\text{ December of } t-1}}$$
- We base the fertility measure on the birth certificates of all 325 West German counties, covering around 580,000 births per year from Population Reference Bureau
- Births per 1,000 women
= Sum of births over 1000 women in reproductive age

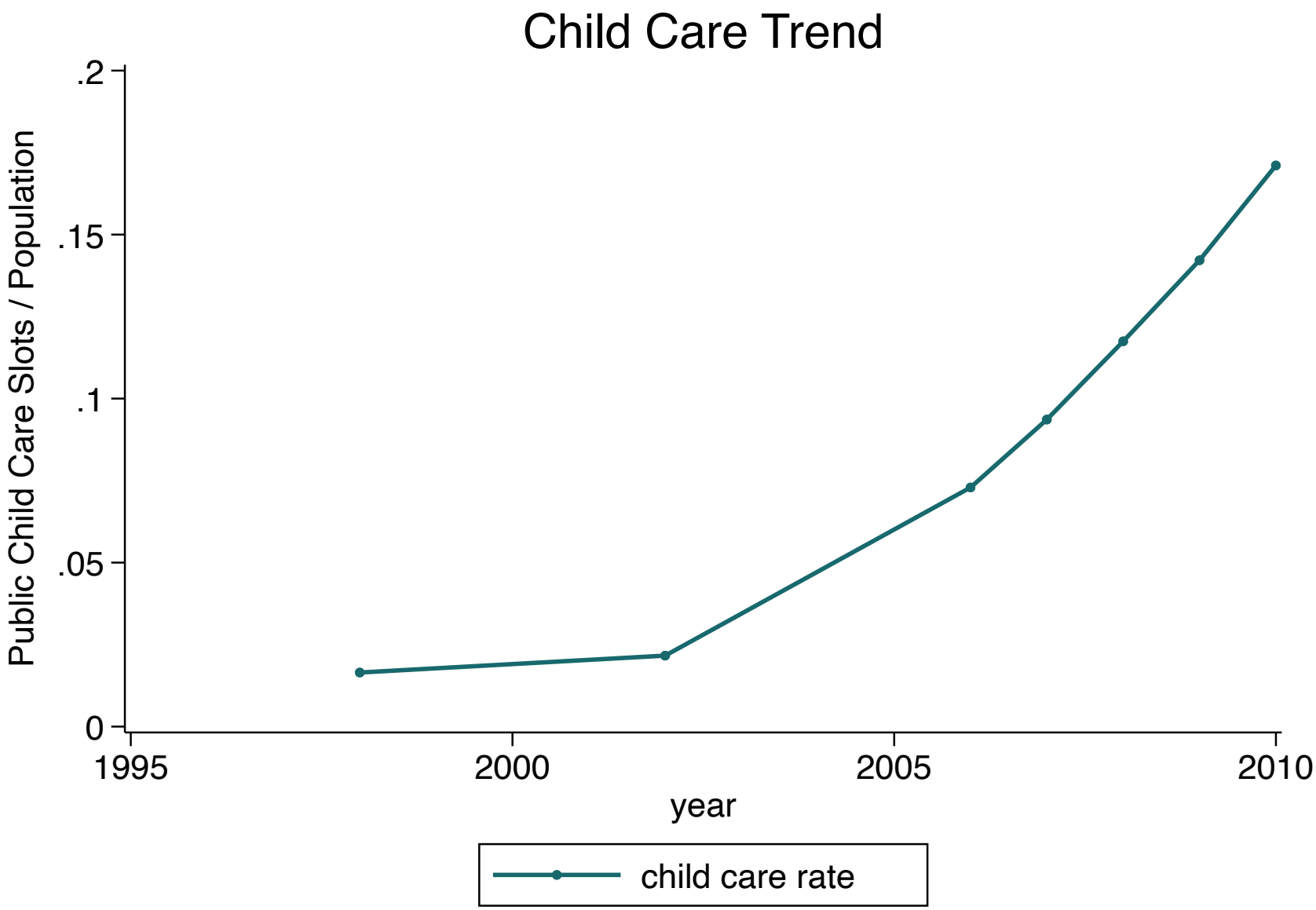
Data

- Other data such as GDP per Capita, Male employment is from Federal Employment Agency
- County level panel data set, averaged over representative individuals
- Data limitation: child coverage rate data is only available for 1998, 2002, 2006 - 2010

Data


Brith Rate Trend
Birth Rate
50
48
46
44
42
1995
2000
2005
2010
year
births over 1000 women

Data


Child Care Trend
Public Child Care Slots / Population
.2
.15
.1
.05
0
1995
2000
2005
2010
year
child care rate

Empirical Strategy

$$Y_{it+1} = \alpha_i + \beta_t + \sum_{t=1998}^{2003} \delta_t(D_i * \beta_t) + \sum_{t=2005}^{2009} \delta_t(D_i * \beta_t) + \epsilon_{ct+1}$$

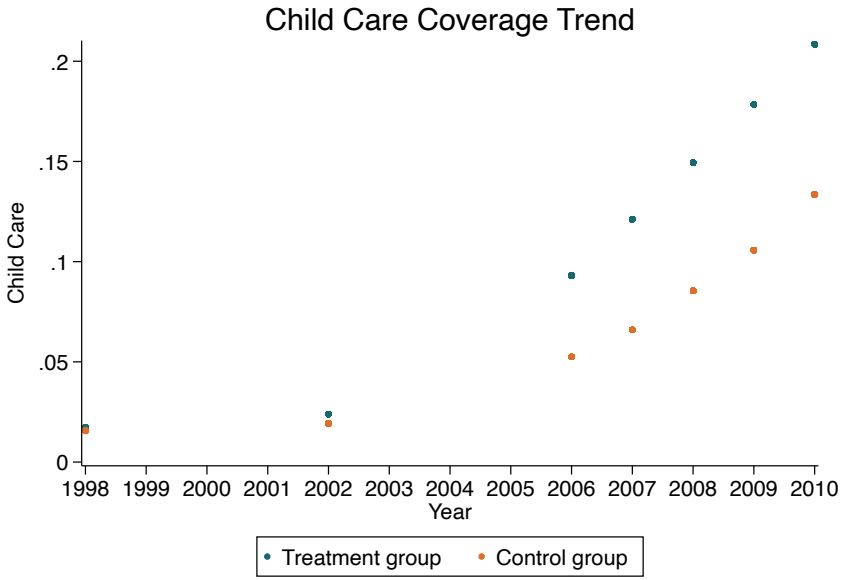
- Treatment Group/ Control Group: West German counties with above-median/ below-median increase in child care
- Where α_i = County Fixed Effect, β_t = Year Fixed Effect, D_i = Treatment indicator
- Validity: Variation in child care growth is independent of expected changes in fertility rates.
- Assumption: The variation is assumed to be created from supply of child care provision. Counties differ in its administration and rules and thus differs in local supply

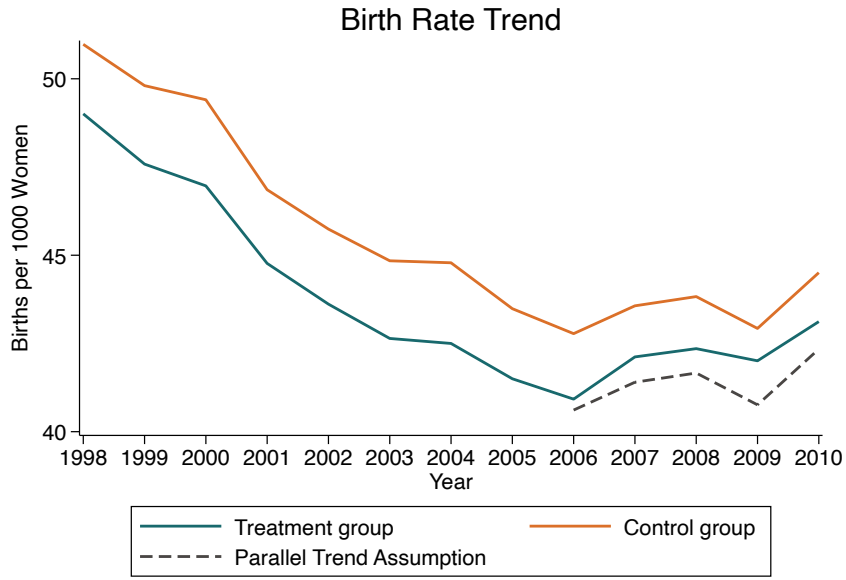
Generalized DID Model

$$Y_{it+1} = \alpha_i + \beta_t + \rho D_{it} + X_{it}\delta + \epsilon_{it}$$

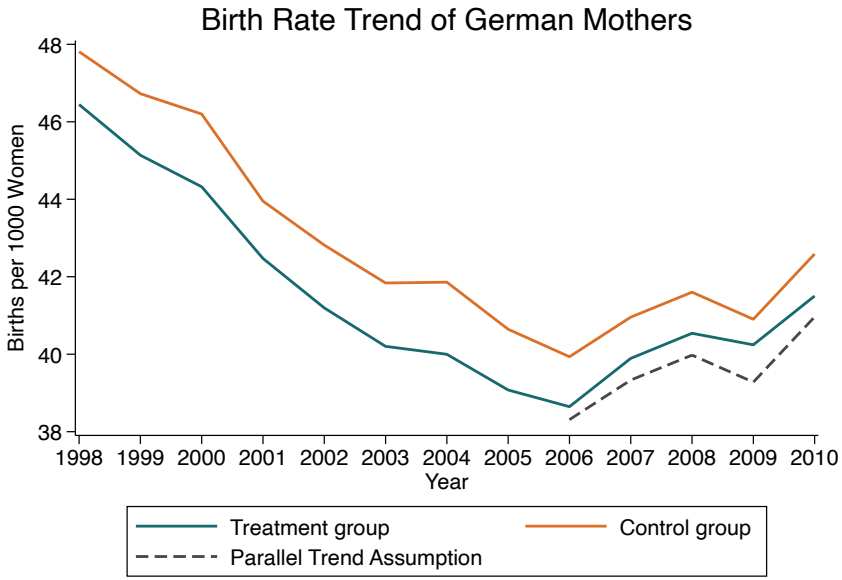
- Where α_i = County Fixed Effect, β_t = Year Fixed Effect, X_{it} = Covariates such as GDP per Capita, Population density, Male Employment rate, New dwelling Units
  ρ = Treatment effect
- Assumption: $Cov(D_{it}, \epsilon_{it}) = 0$
- We expect upward bias of the estimate if counties differ in supply of the child care due to household demands

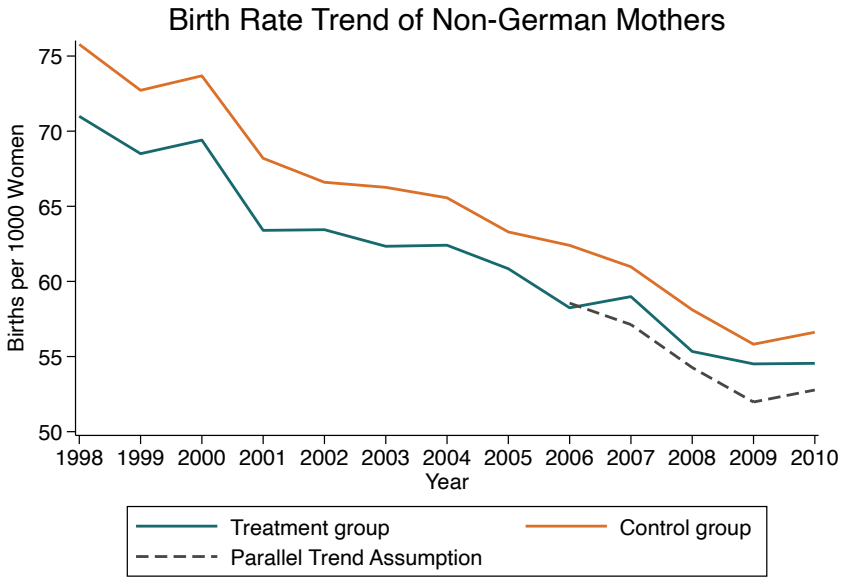
Common Trend Assumption



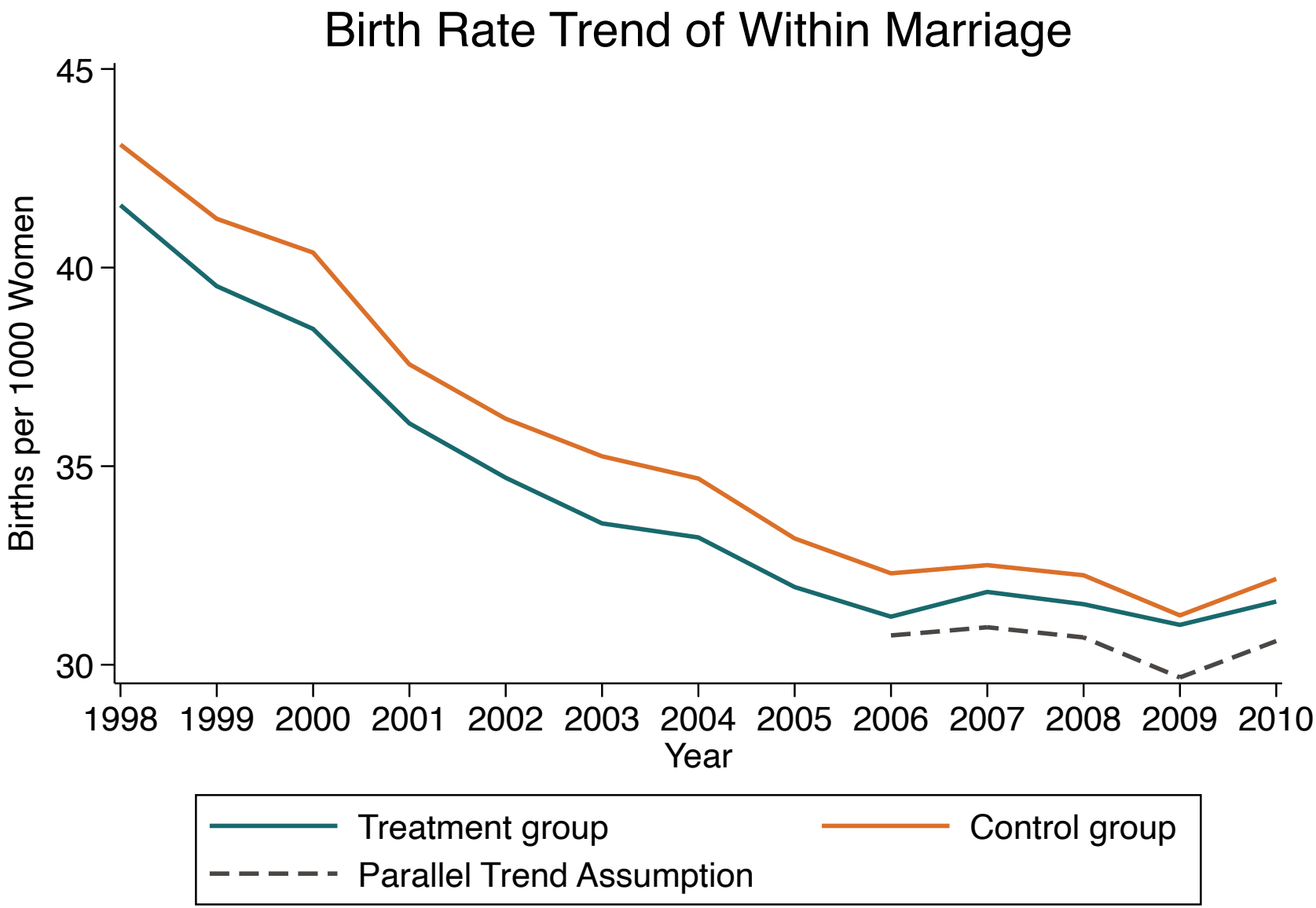


Common Trend





Common Trend



Expected Results

- We expect δ_t to be insignificantly different from 0 for the pre-treatment period while significantly positive for post-treatment periods
- We expect ρ to be significantly positive in the generalized DID model. We can estimate ATT, CATT in the generalized model.
- ρ would represent change in birth rate with respect to a change in public child care coverage rate
- ρ should be compared for German mothers and Non-German Mothers; ρ seems to be bigger for within marriage women than for average German women

Extension and Further Work

- Different Methodology: Regression Discontinuity
- Synthetic Control
  - Construct a control group with parallel trends
  - Assign weights to each county in the control group
  - Choose weights by solving

$$W^* = \arg\max_W (Y_T - Y_C W)' (Y_T - Y_C W)$$

Conclusion

- Re-examination of existing public policies and their appropriate design in a pronatalist direction is needed.
- There exists evidence in favour, and not in favour of child care subsidy (public provision) either in terms of fertility or mother's labour supply
- We contribute to empirical evidence of public child care's effect on birth rates
- We estimate whether there are differential effects of the policy reform among different groups

Reference

- Doepke, Matthias, and Fabian Kindermann. 2019. "Bargaining over Babies: Theory, Evidence, and Policy Implications." American Economic Review, 109 (9): 3264-3306.
- Baudin, Thomas, David de la Croix, and Paula E. Gobbi. 2015. "Fertility and Childlessness in the United States." American Economic Review, 105 (6): 1852-82.
- Stefan Bauernschuster Timo Hener Helmut Rainer, 2016. "Children Of A (Policy) Revolution: The Introduction Of Universal Child Care And Its Effect On Fertility," Journal of the European Economic Association, European Economic Association, vol. 14(4), pages 975-1005, August.