

Public child care and mothers' labor supply

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The Paper

- Public child care and mothers' labor supply—Evidence from two quasi-experiments
- Stefan Bauernschuster (University of Passau and IfO) and Martin Schlotter (Bav. Ministry of Economic Affairs)
- published 2015 in the Journal of Public Economics
- one of the few paper analysing maternal labour supply in Germany

Motivation

- demographic forecasts predict decline of German (and European) population → *more females should work*
- EU has set a target of 75 percent labor market participation for females between 20 and 64 until 2020
- increase of public day care to empower young mothers to participate in the labor market → but is this really efficient?
- heavily discussed in many states elections in Germany and even brought forward by Martin Schulz (SPD) in his campaign for the Federal Election 2017

The setting in Germany

- West Germany seemed very traditional until the early 1990ies
→ low female labor market participation paired with low attendance rates at Kindergardens
- in 1996 the Federal Government introduced the Legal claim to a place in Kindergarden for children between three and six
- those places are heavily subsidized and were *half-time spots*
- in 1996 only 30 to 60 percent of the three or four year old children attended public day-care institutions (private providers account for less than one percent of the market → neglected)

The setting in Germany

- kindergarten year usually starts together with the school year in August or September
- municipalities could set cut-off → children 36 months and older were eligible in the respective year, children younger than 36 months not
- provides us with a exogeneous variation which will be exploited for the quantification of the effect
- *this rule is far from being binding: some municipalities didn't need it, other parents circumvented it*

IV

- if the youngest child is three years old at the cut-off $Z_i = 1$ looks much like Angrist (1991)
- $D_i = \alpha + \delta Z_i + \beta X_i + \epsilon_i$
- eligibility influences daycare attendance
- $Y_i = \eta + \tau \hat{D}_i + \varphi X_i + v_i$
- Second Stage is estimated by usual 2SLS
- debatable whether exclusion restriction is violated here or not
authors argue against this claim

DiD

- simplest version of DiD
- pre and post reform dummy 1996 ($T_i = 0$) and 2001 ($T_i = 1$) and treatment group dummy $D_i = 1$ if the observation belongs to the treatment group
- this yields $Y_i = \alpha + \beta T_i + \gamma D_i + \delta(T_i * D_i) + \epsilon_i$ where δ is the parameter of interest
- in a second specification in the model is extended to the period between 1991 and 2001 with estimated effects for each year
- three control groups: mothers with children 10 and 11 , women without children aged 29 to 36 and women without children aged 18 to 60

Data Sources

- For the IV approach the SOEP (Sozioökonomisches Panel) is used
- provides birth month (for cut-off rule) and data of maternal work on intensive and extensive margin, furthermore multiple covariates are available
- for DiD Microcensus is employed, birthmonth of the child is not available, but large set of covariates and a (broad) indication whether the mother of the child works
- in both cases only families where the youngest child is three or four years old in 1996 are used for the estimations

IV Results

Reduced-form and 2SLS estimates on employment.

| | <i>Employment (yes/no)</i> | | | | | |
|--|----------------------------|------------------|----------------|----------------|------------------|----------------|
| | Reduced form | 2SLS | | Reduced form | 2SLS | |
| | | First stage | Second stage | | First stage | Second stage |
| Above cut-off age at last kindergarten start | 0.064* (0.036) | 0.178*** (0.032) | | 0.065* (0.035) | 0.176*** (0.030) | |
| Child care | | | 0.360* (0.201) | | | 0.366* (0.201) |
| Year controls | No | No | No | Yes | Yes | Yes |
| Federal state controls | No | No | No | Yes | Yes | Yes |
| Individual level controls | No | No | No | Yes | Yes | Yes |
| First stage F-test | | | | | | |
| Robust F statistic | | 30.909 | | | 35.633 | |
| Prob > F | | 0.000 | | | 0.000 | |
| N | 1936 | 1936 | | 1936 | 1936 | |
| R ² | 0.011 | 0.051 | | 0.124 | 0.130 | |

IV Results

- F-statistics are highly significant → no weak instrument problem
- interpretation of the coefficient: 10 percentage points increase in daycare attendance increases labor supply by 3.7 percentage points
- IV identifies LATE for the complier population → those mothers actually shifted by the reform
- ITT estimated by reduced form

DiD results

Difference-in-differences estimations using various control groups.

| Control group: women with... | Employed (yes = 1, no = 0) | | | | | |
|--------------------------------------|----------------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| | 10-11 year old kids | | no kids (age 29-36) | | no kids (age 18-60) | |
| Treatment group (yes = 1, no = 0) | -0.182*** (0.010) | -0.209*** (0.011) | -0.404*** (0.008) | -0.376*** (0.008) | -0.222*** (0.007) | -0.287*** (0.007) |
| After treatment (2001 = 1, 1996 = 0) | 0.059*** (0.010) | 0.053*** (0.010) | 0.028*** (0.005) | 0.021*** (0.005) | 0.044*** (0.003) | 0.040*** (0.003) |
| After treatment * Treatment group | 0.051*** (0.014) | 0.050*** (0.013) | 0.082*** (0.011) | 0.082*** (0.011) | 0.065*** (0.010) | 0.072*** (0.010) |
| Individual control variables | No | Yes | No | Yes | No | Yes |
| N | 19,844 | 19,844 | 25,796 | 25,796 | 108,642 | 108,642 |
| R ² | 0.035 | 0.073 | 0.173 | 0.205 | 0.020 | 0.102 |

DiD results

- results are positive and significant in all specifications
- magnitude roughly the same as in the IV specification (in this period the attendance rate increased by 15 percentage points which yields approx. 3,7 percentage points increase in employment for the respective mothers for an 10 percentage point increase)
- coefficients not affected by the inclusion of control variables

Robustness Checks for the IV

- specification with working hours → intensive and extensive margin but results are comparable in magnitude
- placebo IV with instrumenting in period t-1
- checking mothers and with youngest child above and below the threshold → rather balanced except for mothers' age

Robustness Check for DiD

- extended version of the model with estimate for every year, results mirror the results obtained previously
- performing Placebo test with other treatment period reveals insignificant effects, so confirms use of DiD
- checks for common trends assumption with control variables, → although some distinct developments in one or the other control group reasonable
- different control groups yield comparable results

Achievements

- calculates ITT and LATE with rather simple methods
- contributes to the (growing) literature in the field in Germany, estimates magnitude and effectiveness of such measures → potential use for cost-benefit analysis
- two approaches using a quasi-experimental set-up increase the confidence in the observed modest effect

What could be done differently?

- the control groups are not optimal chosen since the reform was implemented everywhere in Germany
- detailed records about cut-off rules in municipalities would have increased precision, identifying individuals' county at least is for both datasets doable
- not clearly expressed yet but many international paper take a look at the prices as well → availability \neq affordability

Outlook

- Kindergarden fees vary substantially over states and even municipalities
- to study effects data must be collected; problem: no central record
- for NRW, IZA has started to collect data in the most detailed fashion
- other structural breaks could be used