



Public child care and mothers' labor supply—Evidence from two quasi-experiments



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ABSTRACT

Public child care is expected to assist families in reconciling work with family life. Yet, empirical evidence for the relevance of public child care to maternal employment is inconclusive. We exploit the introduction of a legal claim to a place in kindergarten in Germany, which was contingent on day-of-birth cut-off dates and resulted in a marked increase in kindergarten attendance of three-year olds in the following years. Instrumental variable and difference-in-differences estimations on two individual-level data sets yield positive effects of public child care on maternal employment. A set of placebo treatment tests corroborate the validity of our identification strategies.

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1. Introduction

Recent years have witnessed substantial political effort to increase public child care provision in many industrialized countries. Providing subsidized child care is supposed to promote reconciliation of work and family life for the mothers of young children and increase their labor force participation. However, empirical studies find mixed results for the actual effects of subsidized public child care on mothers' employment. For some countries, economists have identified clearly positive effects. For other countries, reforms which aimed at increasing availability or affordability of public child care had zero effects on maternal employment (or effects that are substantially smaller than the take-up rate). In particular, marginal decreases in the costs of child care do not affect maternal labor supply if employment rates and child care attendance rates are already high. Further, we should not expect substantial employment effects if newly available public child care slots simply crowd-out existing private child care arrangements. Crowding-out might be particularly relevant if public child care slots are still severely rationed after expansion. It might be that the newly provided public child slots are then primarily given to mothers already closely attached to the labor

market, and that these mothers now just substitute private care with public care arrangements.

This paper contributes to the growing empirical literature on child care and maternal employment by providing first quasi-experimental evidence from a German public child care reform introduced in 1996. At that time, West Germany had long been known for its low female and, in particular, maternal labor force participation. Indeed, the employment gap between mothers of three to four year old children and women of a similar age but without any children amounted to 40 percentage points in 1995. To improve reconciliation of family and working life, expansion of public child care has been at the top of the political agenda for the past two decades. One of the most prominent political reforms in this context was the introduction of the legal claim to a place in kindergarten (Rechtsanspruch auf einen Kindergartenplatz) in 1996. Since that year, children from age three until school entry are eligible to attend highly subsidized half-day public child care. Thus, this reform intended to abandon any rationing of public child care for three to six year olds. While public child care attendance by five- and six-year old children was already at a very high level of 90% prior to the reform in West Germany, attendance by three- and four-year old children was substantially lower at 30% and 60% respectively. Despite the fact that public provision of child care has thus been far from universal (and non-existing for children under three), virtually no private market for child care had emerged. As expected the introduction of the legal claim to a place in kindergarten triggered a sharp increase in public

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child care attendance by three- and four-year olds from 1996 to 2001. To the best of our knowledge, the effects of this seminal German child care reform have not yet been analysed, although it might give us interesting insights which are relevant for systemizing recent findings in the literature on public child care and maternal employment.² In particular, our reading of the previous literature suggests that we should expect large and positive effects of public child care on maternal labor supply in West Germany since a) the reform provided highly subsidized universal public child care, b) public child care was far from universal prior to the reform, c) there was no private market for child care which could be crowded out by a public child care expansion, and d) maternal employment rates were low at the time the reform set in despite the fact the females were very well educated.³

The special features of the German policy reform in 1996 allow us to conduct both instrumental variables and difference-in-differences estimations within a single paper. In our first identification strategy, we exploit the fact that after introduction of the legal claim to a place in kindergarten in 1996, some municipalities were confronted with severe problems since they could not meet the increased demand for child care. This is why the German Federal Parliament (Deutscher Bundestag) adopted a legislative initiative proposed by the Federal Council of Germany (Bundesrat) that allowed communities to introduce day-of-birth cut-off rules for determining whether or not a child was eligible for public child care. The respective cut-off dates were the start dates of the “kindergarten year”, which vary over federal states and years and typically coincide with the start dates of the school year. Due to these cut-off rules, in an extreme case, children turning three years old slightly after the cut-off date, i.e., the start date of the “kindergarten year”, could not enter kindergarten right at their third birthday but only became eligible to attend kindergarten one year later, i.e., at the date the following “kindergarten year” started. These day-of-birth cut-off rules provide us with exogenous variation in attendance at German kindergarten, which we exploit in a 2SLS instrumental variable approach. Note that this approach identifies the local average treatment effect of public child care on maternal employment for the group of compliers, i.e., for those mothers who live in a municipality that applies the cut-off rule, who get a slot in public child care due to this rule and immediately take this slot but would not have been able to have a public child care slot otherwise.

Drawing on the rich individual-level data of the German Socio-Economic Panel (SOEP), our instrumental variable estimations yield positive effects of public child care on maternal employment. Intention-to-treat estimates suggest that eligibility for public child care increases mothers' labor supply by 6 percentage points. Second-stage results show that if a mother's youngest child actually attends public child care as a result of the cut-off rule, this mother's probability of being employed increases by roughly 35 percentage points. This also means that about two thirds of these mothers use child care for other reasons than taking up a job.

Investigating the heterogeneity of our first-stage estimates gives us some sense about the validity of our approach and at the same time allows us to characterize the complier subpopulation for which the effects are identified. In particular, we show that the cut-off rules were mostly applied in West Germany during the first years after introduction of the legal claim to a place in kindergarten. The relevance of the cut-off rules

² Most of the German evidence so far is based on predominantly descriptive studies or micro-simulations. Buechel and Spiess (2002) identify a significant positive association between regional public child care provision for three- to six-year old children and mothers' employment. Bick (2011) uses a micro simulation model to show that a lack of public child care in West Germany keeps women from labor market participation. Two recent papers exploit policy changes. Felfe and Lalive (2012) deal with child care for toddlers and child development and, in an aside, report some tentative evidence for positive effects of public child care on maternal employment. Finally, Gathmann and Sass (2012) analyze a reform in the East German state of Thuringia that increased prices for public daycare to find negative effects on female labor supply.

³ If the lack of a private market for child care indicated a lack of demand, for example because society believes that maternal care is more beneficial for young children, this would of course mitigate any positive effects.

becomes weaker with years passed since the reform and is virtually nonexistent in East Germany, where capacity constraints in public child care were not an issue. Further analyses suggest that the first stage tends to be stronger for more educated mothers, mothers with above median age, mothers having older children as well as mothers whose youngest child's age distance to his oldest sibling is above median. To investigate the validity of our instrumental variable approach, we run first-stage regressions in placebo treatment periods before 1996. Further, we perform placebo treatment tests drawing on the panel structure of the SOEP in which we investigate whether our instrument can predict maternal employment in the year preceding actual kindergarten entrance. All these specification tests corroborate the validity of our instrumental variable approach. In further robustness checks, we run piecewise linear regressions and gradually restrict the sample to observations very close to the cut-off. Of course, once we restrict the sample, the number of observations decreases resulting in large standard errors. But still, the point estimates of all these alternative specifications are very similar to those estimated in the standard specification.

In a second identification strategy, we exploit the marked increase in public child care provision for three- and four-year old children in the years following introduction of the legal claim to a place in kindergarten. To this end, we use data from the German Micro Census, Europe's largest household survey. In a difference-in-differences approach, we compare the employment ratios of mothers with three- and four-year old children in 1996 and 2001 with the employment ratios of mothers with older children and, as an alternative, also the employment ratios of women without children. The difference-in-differences estimations confirm the positive causal effects of public child care on maternal employment. To provide evidence that the key identifying assumption of our difference-in-differences approach is met, namely, that the treatment and control group follow the same time trends in the absence of the treatment, we run placebo treatment tests in pre-treatment periods. These placebo treatment tests show that our treatment and control groups do indeed follow the same time trend in the years preceding the actual treatment; thus, they corroborate the key assumption of our difference-in-differences model. We find that the results from the difference-in-differences model using the German Micro Census are remarkably similar to the instrumental variable results using the SOEP, although we identify average treatment effects on the treated (ATT) in the difference-in-differences approach and local average treatment effects (LATE) for the complier subpopulation in the instrumental variables approach. The reason for the fact that both approaches still yield very similar results could be that, in the end, in both identification strategies a very similar group of mothers is affected by the treatment, namely mothers living in West Germany in the late 1990s who get the opportunity to work because their three- or four-year-old child, who is also their youngest child, becomes eligible for public child care in a country where public child care was severely rationed before the reform, no market for private care existed and maternal employment was traditionally low despite the fact that women were very well educated.

The rest of the paper is structured as follows. Section 2 summarizes the empirical literature on public child care and maternal employment. Section 3 describes the pre-reform setting as well as the 1996 public child care reform in Germany and explains how we exploit this reform in two quasi-experimental settings. Section 4 provides information on the rich individual level data sets of the SOEP and the German Micro Census that we use in our analyses. In Section 5, we present instrumental variable results using the SOEP data and corroborate these results applying difference-in-differences techniques on the German Micro Census. Thereafter, we discuss the size of the effects and try to compare the effects to those identified in previous studies. Section 6 concludes.

2. Literature on public child care and maternal employment

Earlier empirical studies analysed the role of child care prices for mothers' employment (see Blau (2003) or Blau and Currie (2006) for

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