The dynamic fiscal return to childcare subsidies

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Abstract

Childcare policies improve the compatibility of family and career and therefore increase maternal life-cycle earnings and tax payments. How much should childcare be subsidized due to this dynamic fiscal externality? To provide quantitative answers, we estimate a dynamic discrete choice model of female labour supply and childcare decision on German panel data. We account for a large amount of heterogeneity: beyond heterogeneous preferences, education levels, wages, and availability of informal child care, we also account for heterogeneity in fertility such as timing of birth(s) and number of children. In addition, we incorporate regional differences in public childcare availability and subsidies. We then evaluate the universal childcare program in Germany through the lens of this model. We find that a recent major expansion of publicly provided childcare supply (almost) fully paid for itself through the dynamic effects on maternal tax payments. Increasing subsidies further from the current generous levels ($\approx 80\%$), however, would only be 6% self-financing because it would primarily benefit households that are infra-marginal in their childcare and labour supply decision. We further explore the fiscal resturns of increasing the number of daycare centers to reduce commuting distances for parents.

Keywords: Female Labour Supply, Childcare, Family Policies, Fiscal Externalities, Dynamic Discrete Choice

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Motivation Numerous studies have evaluated early childcare programs that were targeted to disadvantaged children. García et al. (2020), for example, evaluate the experimental settings of the famous ABC and CARE projects[1] with respect to child outcomes and parental earnings. They find that the long-run effects on child and maternal earnings implied increases in net tax revenue that exceed the direct costs of the programs. Consistent with that, Hendren and Sprung-Keyser (2020) document that most targeted childcare programs were self-financing. An important question that remains is how such results translate to early childcare programs that were not targeted to low-income families.

Baker, Gruber, and Milligan (2008, 2019) analyse such a universal childcare program in Quebec. They find rather detrimental effects on child outcomes but positive effects on parental earnings. The implied tax revenue increase of the latter amounted to (only) 40% of the program costs, however, long-run effects on parental earnings are neglected in the analysis. These results show that the very positive effects found for targeted programs do not necessarily generalize to universal programs.

In this paper, we use a structurally estimated dynamic household model to analyse a nationwide public childcare program in Germany. First, we evaluate a large public childcare expansion that reduced the previous rationing of childcare slots significantly. Second, we go one step further and study the fiscal effects of changes to the current childcare fee schedule, which subsidizes childcare slots at a rate of ≈ 80 %. Lastly, we examine an extended provision of slots, addressing the considerable commuting distances many parents endure to reach the nearest daycare center taking regional differences in availability into account.

Approach We consider a dynamic heterogenous family model. Households have up to three children. Fertility follows an exogenous stochastic process, which allows to capture the substantial empirical heterogeneity in family composition and the age of parents at first birth. Households with young children decide how to provide care for the children and whether the mother works full time, part time or does not work at all. Regarding childcare, they decide between the female spouse caring for the children at home, informal childcare e.g. by grandparents or the use of market childcare services. A distinct feature of our model is the large amount of heterogeneity. Households differ in education, female wages, male wages, and family composition and are heterogeneous in three further dimensions: their preference for home produced childcare, their taste for the leisure of the female spouse, and their access to free informal childcare.The quantification of the model is carried out mainly with panel data from the German Socio-Economic Panel (GSOEP). In a first step, we estimate reduced form relationships: we estimate how childcare fees currently vary with income and family structure, we estimate a stochastic fertility process based on education and we estimate Mincerian wage equations that account for dynamic wage penalties from staying out of the labour market or working part time. For

[1]Carolina Abecedarian Project and the Carolina Approach to Responsive Education respectively.

the second part of the quantification, we use the explicit structure of the dynamic model. We apply a maximum likelihood approach and account for measurement error in childcare hours and wages. We estimate the joint distribution of the unobserved preferences for home produced childcare and for female leisure, as well as the access to informal childcare. Our estimation strategy is to find the distributional parameters that maximise the likelihood of matching the observed dynamic household choices in terms of female labour supply and used hours of market childcare services with their model counterparts.

Our model builds upon and extends the framework presented by Koll et al. (2023). This enhancement incorporates heterogeneity across states regarding childcare subsidies and, crucially, variation in public childcare availability. Despite a legal entitlement to a slot in public daycare centers, many parents grapple with extended commutes to access these facilities. We leverage the differing state provisions of comprehensive childcare centers in our analysis.

Preliminary results First, we simulate the policies prior to 2007 before the childcare expansion started. Based on that, we find that the increase in publicly provided childcare was 96% self-financing. While only for each third child that got enrolled, the mother increased labour supply, the implied dynamic fiscal externalities are substantial. There is quite some heterogeneity in the size of the effect: among the set of high-income mothers ($\geq$ 25 EUR hourly wage), the reform the reforms leads to an increase in tax revenue twice as large as the rise in subsidies. Among mother with an hourly wage of $\leq$ 15 EUR, the reform is only 55.6% self financing. The primary reason (beyond differential rates of crowding out informal childcare) is the higher fiscal externality for mothers with higher wages.

Second, we simulate an untargeted increase in childcare subsidies and find it to be 6% self-financing. The main reason is that such an increase is mainly a subsidy to families that are already using public childcare and do not increase labour supply as a response to the reform. At the same time, the number of mothers that are still marginal in their decision is relatively low. We find evidence for heterogeneity along the household income distribution: for households with above median income the untargetd increase is about 10% self-financing whereas it drops to 2.4% for those below median. This is due to higher wages but also higher marginal taxes that mothers living in above-median income households face.

Finally, in a third policy experiment we condition the subsidy increase on the labour supply decision of the mother. If the subsidy expansion is contingent on full-time working mothers, it would dynamically refinance itself by 70%. The intuition here is that the share of mothers that work full-time for current policies is actually only around 12%. Hence, the number of infra-marginal families that receive extra subsidies without generating additional tax revenue is quite low in comparison to the number of marginal households where the mother now switches to full time.

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