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研究課題名（和文）Program design and social insurance in dynamic models of labor supply, saving and human capital formation

研究課題名（英文）Program design and social insurance in dynamic models of labor supply, saving and human capital formation

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研究成果の概要（和文）：このプロジェクトでは、認知功績生産機能と共同して、母性労働供給と育児利用の動的で離散的な選択モデルを開発し、推定しました。推定モデルは、将来の政策について政策立案者に通知するという目標を掲げて、反発的な育児政策をシミュレートするために使用された。ヘッドスタートの実験的なインパクト推定値を再現するために、非実験的推定量の能力を調べた。結果は、推定量の選択よりも、推定量が結果変数の領域に対してより敏感であることを示唆した。しかし、一般的に、観察されない異質性に対処した推定値はよりよく実行され、結果は回帰対傾向スコア推定値に対してあまり敏感ではなかった。

研究成果の概要（英文）：For this project I developed and estimated a dynamic, discrete choice model of maternal labor supply and child care use jointly with a cognitive achievement production function. The estimated model was used to simulate counterfactual child care policies with a goal to inform policymakers about prospective policies. I explored the ability of nonexperimental estimators to replicate experimental impact estimates of Head Start. The results suggested that the estimators were more sensitive to the domain of the outcome variable rather than the choice of estimator. In general, however, estimators that addressed unobserved heterogeneity performed better and the results were less sensitive to regression vs. propensity score estimators.

研究分野：　社会科学

キーワード：　Child care　Child development　Labor supply　Program evaluation

１．研究開始当初の背景

The importance of the formation of child skills has been an increasing focus in economics research given the importance of skills for many adult outcomes and evidence that skills are formed relatively early in life. Given that children spend many hours in child care (Griffen 2018) and that the quality of child's environment either in the home (Bradley and Caldwell, 1976; Murnane et al., 1981; Todd and Wolpin, 2007; Cunha and Heckman, 2008) or in child care (Love et al., 1996; Duncan, 2003) is important for the determination of cognitive skills, it is crucial to understand how different child care policies affect the formation of skills.　Given that maternal employment is linked closely with the use of non-parental child care, it leads to the conclusion that any governmental policy that affects either child care or maternal labor supply potentially has important impacts on the formation of both children's cognitive skills and maternal labor market experience. Moreover, the formation of children's cognitive skills is a dynamic process (Todd and Wolpin, 2003, 2007; Cunha and Heckman, 2007) and the role of labor market experience in female labor supply decisions (Eckstein and Wolpin, 1989; Keane and Wolpin, 2010) each suggest the importance of a dynamic modeling approach. Most previous research in economics on child care and children's cognitive skills suffers an important limitation in that it does not incorporate ideas from developmental psychology that emphasize the measurement of not just the time spent in child care but the quality of the child care environment. While developmental psychology papers ignore issues of sample selection and endogeneity, economics research can rightly be criticized for not addressing theories of child development appropriately. For example, recent published research by Bernal (2008), Keane and Bernal (2010, 2011) and Del Boca, Flinn and Wiswall (2010) estimate the effects of time but not quality inputs, which is inconsistent with how developmental psychologists view child development (Lamb 1998).

A related issue is understanding whether nonexperimental program evaluation estimators can reliably uncover causal impacts of early child care programs. This longstanding issue began with LaLonde (1986) in the context of labor market training but has branched out to consider other outcomes and types of programs. Given that importance of early child care programs in affecting skill formation and given the drawbacks in randomly evaluating programs (cost, program distortion, nonrandom attrition)

an important issue is to investigate whether nonexperimental estimators work in the context of child care programs or not. The existence of randomized controlled trials gives researchers the opportunity to test nonexperimental estimators. One such RCT is the evaluation of the Head Start Program, which is one the subjects of the current research. However, a major challenge in implementing a nonexperimental evaluation strategy is choosing among the variety of estimation methods available. The choice is important given accumulated evidence that impact estimates can be highly sensitive to the identification strategy and estimator used.

２．研究の目的

The purpose of this study was twofold (1) to develop a model of a child care policies in the context of children's skill formation and work decisions of mothers in order to understand the impact of prospective child care policies on outcomes and (2) to evaluate the ability of nonexperimental estimators to replicate experimental impacts in the context of Head Start, which is a preschool program for poor children in the United States.

The first project "Evaluating the Effects of Child Care Policies on Children's Cognitive Development and Maternal Labor Supply" gives policymakers information about the future policies that may not have been tried yet and also gives provides quantitative insight into the mechanisms behind how child care policies may affect children's skills.

The second project "Assessing the Performance of Nonexperimental Estimators for Evaluating Head Start" provides information to researchers trying to understand whether regression and propensity score methods can reliably uncover experimental impact estimates in the context of child care programs. Such information can be used to understand whether commonly used program evaluation works in other contexts where researchers do not have access to experiments.

３．研究の方法

In the project "Evaluating the Effects of Child Care Policies on Children's Cognitive Development and Maternal Labor Supply", I developed and estimated a dynamic, discrete choice model of maternal labor supply and child care use jointly with a cognitive achievement production function. I estimated the model using Indirect Inference with data from the Early Childhood Longitudinal Study – Birth cohort (ECLS-B). Counterfactual simulations from the model suggest large impacts on cognitive skills from expanding

Head Start to current non-eligibles and negligible impacts of subsidies on cognitive skills of current eligibles

In the project “Assessing the Performance of Nonexperimental Estimators for Evaluating Head Start”, we used data from both the ECLS-B and the Head Start Impact Study (HSIS) and estimate program evaluation estimators (cross-sectional regression, difference-in-difference regression, cross-sectional propensity score matching, and difference-in-difference propensity score matching) across outcomes in four domains (cognitive, health, parenting, and labor). Some of the estimators closely reproduce the experimental results, but a priori it would be difficult to know whether the estimator works well for any particular outcome. Pre-program exogeneity tests eliminate some outcomes and estimators with the worst biases, but estimators/outcomes with substantial biases pass the tests. The difference-in-differences matching estimator exhibits the best performance in terms of low bias values and capturing the pattern of statistically significant treatment effects. However, the variation in bias is greater across outcomes examined than across methods. One innovative feature of our study is that we estimate the program entirely in the comparison data set because the scale of the Head Start program. This more closely mimics how evaluation research is commonly done.

４．研究成果

The research findings were presented at several major conferences and universities and resulted in publications in two top field journals in economics (Journal of Human Resources and Journal of Labor Economics).

５．主な発表論文等

〔雑誌論文〕（計２件）

1. “Evaluating the Effects of Child Care Policies on Children's Cognitive Development and Maternal Labor Supply”, Andrew S. Griffen, Journal of Human Resources, forthcoming, referee reading（査読有）掲載確定

2. "Assessing the Performance of Nonexperimental Estimators for Evaluating Head Start," Andrew S. Griffen and Petra E. Todd, Journal of Labor Economics 35, no. S1 (July 2017): S7-S63, referee reading（査読有）

〔学会発表〕（計４件）

1. "Assessing the Performance of Nonexperimental Estimators for Evaluating Head Start", Andrew S.

Griffen, Symposium on “Analysis of Social Environments in Childhood on Human Capital Formation”, Gakushuin University, Tokyo, Japan, January 21 2017

2. “Evaluating the Effects of Child Care Policies on Children's Cognitive Development and Maternal Labor Supply”, Andrew S. Griffen, Asian Conference on Applied Microeconomics / Econometrics, Tokyo, Japan, January 9-10 2016

3. "Assessing the Performance of Nonexperimental Estimators for Evaluating Head Start”, Andrew S. Griffen, OEIO Workshop - University of Tokyo, August 12, 2015

4. “Evaluating the Effects of Child Care Policies on Children's Cognitive Development and Maternal Labor Supply”, Andrew S. Griffen, Tokyo Labor Economics Workshop, May 8, 2015

６．研究組織

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