<u>**Summary of Research Project Results (Szakmai beszámoló)**</u>

Title: Does Subsidized Childcare Matter for Maternal Labor Supply? A Modified Regression Discontinuity Analysis

1. <u>**Project summary**</u>

The goal of the research project was to quantify the effect of childcare availability on the labor market activity of mothers, which has direct relevance for the evaluation of labor market policies aimed at expanding the activity of mothers with young children. The project was funded by OTKA grants KJS-K-101665/2011 and KJS-K-101862/2011, running between January 2012 and December 2013. It was carried out in a collaboration between the Centre for Economic and Regional Studies of the Hungarian Academy of Sciences and HÉTFA Research Institute. For the analysis, we linked several sources of data, received from the Databank of the Centre:

- Labour Force Survey on individuals and households,
- TSTAR and KIRSTAT regional data,
- data on commuting (developed by Kertesi et al. 2012)[1]

The data was linked and further harmonized during the project.

We developed an econometric method that is new in international research, and allows us to estimate the impact of childcare more precisely. The method allows us to separate the childcare effect from other factors that change simultaneously around age 3 of the child in Hungary: the end of parental leave and changes in the preferences regarding separation from the child. This was not possible in previous studies, and is important for the evaluation of the impact of potential expansions of the state subsidized childcare system. Furthermore, the issue is crucial to determining the correct mix of policy measures aimed at mothers of young children: we are able to determine how much childcare, and how much parental leave and other factors contribute to the current low level of their labor supply. Our project therefore produced useful output in both the areas of domestic policymaking and international scientific research: the empirical method can be applied elsewhere in the future, and the estimates can be used in impact analyses of planned policy measures. It has direct relevance in developing an effective mix of policies.

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[1] Kertesi, G., Kézdi, G., Molnár, T., Szabó-Morvai, Á. (2012): School Catchment Areas in Hungary.

2.   Scientific Summary of Research Results

Encouraging higher labor market participation of women, especially mothers of young children, is an important policy goal in most countries. Employment prospects following childbirth play a key role in two additional processes: fertility decisions and employer discrimination. Many factors affect a woman's ability and willingness to work after having a child, such as parental leave, tax/child benefits, childcare availability and costs, labor market opportunities, and societal attitudes. The possible range of policy tools is correspondingly varied, but recent consensus among policymakers is that the expansion of subsidized childcare is an important component.[2] To find the most effective mix of policies - and to forecast the benefits of investment in childcare facilities - it is important to estimate the impact of childcare (as well as other factors) on mothers' labor supply precisely.

Due to the inherent endogeneity of subsidized childcare availability with respect to regional and individual characteristics, Regression Discontinuity seems to be the most promising method for measuring a causal effect, as enrollment cutoffs create a quasi-experimental setup. To our knowledge, so far only one study used regression discontinuity (RD) to measure the childcare effect (Fitzpatrick 2010), not only due to lack of availability of such data, but also because the applicability of RD is limited by the fact that other factors (such as family benefits) often change simultaneously with childcare availability.[3] We propose a modification of the RD method that can be used in cases where changes in various factors are tied to different underlying running variables. While eligibility for kindergarten depends on both age and calendar date (whether the child turns 3 prior to the cutoff), parental leave and separation preferences depend only on the age of the child. We can therefore identify the effect of childcare availability and separate it from the effect of factors that are not dependent on the calendar date by holding child age, rather than the date of observation, constant in our samples of treatment and control groups. This method requires the use of repeated cross-section or panel data, but enables better measurement of the childcare effect by extending the usability of RD to cases where it was not previously possible.

In our research, we define treatment and control groups based on whether the mother's child is eligible for kindergarten or not (turns 3 before or after the cutoff date). We then utilize a sampling

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[2] EU targets have been set for minimum coverage requirements at the Barcelona Summit, 2002.

[3] In our analysis of Hungary, for example, subsidized kindergarten becomes available to mothers when their child turns 3, which corresponds to the end of parental leave and (according to surveys) a strong shift in the population's views regarding when mothers should return to work (Blaskó 2011).

design that holds the age of child at observation constant. That is to say, we estimate the difference in the participation rate of the treatment and control groups not at the same calendar date, but in the quarter after the child turned 3, so children of the two groups are the same age on average. As a result, discontinuities related to child age affect the treatment and the control groups similarly, and do not bias the estimation of the treatment effect. Contrary to the standard RD setup, this sampling design makes it possible for us to separate birth date and age effects. It is important to note that in this setup, the groups differ by the season in which they are observed and that their child was born. This means that estimates may be affected by selection bias if parental characteristics or child development differs by season of birth of children, or if labor market opportunities (and therefore, labor supply) differ by season. We control for this by including mothers with 4-5-year-old children, separated into two groups based on the same cutoff date, as comparison groups, and combining RD with difference in differences estimation. These comparison groups should be affected by the same seasonal effects, but not by the treatment effect, allowing us to separate out seasonal factors. Empirical evidence suggests that in reality, September 1st is not strictly enforced as the cutoff date, so we explore alternative eligibility cutoffs, including one that is not a single point in time, but a time interval.

Our results point to a significant effect of childcare availability on mothers' participation. The estimates suggest that subsidized childcare availability has a significant positive effect on mothers' labor suppl. Namely, increasing subsidized childcare availability for children around 3 years old by 10% increases the participation rate by 1.8%. The improvement of childcare opportunities explains almost a third of the 31 percentage point increase in mothers' labor market participation seen around age 3 of children. The results highlight the importance of eliminating endogeneity biases due to unobserved individual and regional characteristics, as well as separating the childcare effect from other factors that are child age-related. We measure the impact at a point in time when the participation rate of mothers is still low, many of them had not yet returned to the labor market even if they plan to do so, and they are still likely to be constrained by lack of childcare availability. The external validity of the estimates is limited by cross-country differences and differences related to child age, making it difficult to compare their magnitude to previous international results or draw conclusions regarding the effect of childcare expansion for younger children. However, we believe that our study provides more reliable evidence than previous studies that a significant impact exists if childcare is not available at the child age when mothers are considering returning to the labor market.

The most important policy implication of our study stands out when we take the overall pattern into account. There is a sharp increase in mothers' participation rates around age 3 of their child of about

31 percentage points, which is confirmed by the standard RD estimate. This is due to the combination of increased childcare availability and the other age-related exogenous factors that change at that time. Of this 0.31 increase, we estimate that childcare availability can explain about 9.5 percentage points, or almost one third. We cannot determine the importance of the other factors relative to each other, however, the end of parental leave alone is unlikely to explain the rest of the change, as the monetary amount received in the last year before the child turns 3 is comparable to the childcare subsidy. Therefore, it is likely that preferences about separation play a key role, which are culture-based, but also may themselves be affected by the institutional framework.

The timing suggests that changes in preferences are related to the institutional framework, which can have an influence through several possible channels. The length of parental leave and starting age of kindergarten may be perceived as a signal by mothers (and society), suggesting that age 3 is the appropriate time for separating from the child and returning to work. It is also possible that, lacking clear views on the matter, mothers simply use the age suggested by the institutional framework as a rule of thumb for when they should return to work. Alternatively, employers may assume that after age 3, childcare duties of mothers are less of a constraint (children get sick less, need less attention), and be more willing to employ them, which, in turn, may influence mothers' expectations and participation. Additionally, the effectiveness of childcare expansion in increasing mothers' labor supply may be limited by other factors, such as the lack of availability of part time work, and the inflexibility of childcare services in terms of hours offered. To sum up, policymakers need to take both possible complementarities with other factors, as well as the signaling effect of the institutional framework into consideration while designing cost-effective policies to successfully increase maternal labor supply. The final message is therefore that a combined approach is necessary for achieving an increase in the labor supply of mothers, which takes the signals given to society into consideration as well.

3. Output and Dissemination of the Results

Presentations

The research was presented at numerous Hungarian and international conferences, workshops, and seminars:

- Central European University seminar

- Eötvös Lóránd University seminar
- HÉTFA Research Institute seminar
- Centre for Economic and Regional Research seminar
- University of Washington summer brownbag seminar
- Szirák Conference on Labor Market Research
- Visegrad 4 Workshop on Childcare organized by the Budapest Institute
- Hungarian Society of Economists (MKE) conference 2013

Publications

The project produced a working paper that was published in two open-access forums:

- Lovász, A. – Szabó-Morvai, Á. (2013): Does Childcare Matter for Maternal Labor Supply? Pushing the limits of the Regression Discontinuity Framework. Budapest Working Papers on the Labour Market, BWP 2013/13.
  http://www.econ.core.hu/file/download/bwp/bwp1313.pdf
- Lovász, A. – Szabó-Morvai, Á. (2013): Does Childcare Matter for Maternal Labor Supply? Pushing the limits of the Regression Discontinuity Framework. HÉTFA Research Institute Working Papers, http://hetfa.hu/wp-content/uploads/Childcare_OTKA_5aug2013_SzMA.pdf

The paper has since been revised and, based on the recommendations of peers in the field from Hungary and the USA, it is in the process of being submitted to a high-ranking international journal, the Journal of Human Resources. JHR is one of the most highly cited journal in the Industrial Relations and Labor fields per ISI Journal Citation Reports (Ranking: Economics: 27/321, Impact Factor: 2.371, 5-Year Impact Factor: 3.162).

Additionally, we are currently translating a shorter version to Hungarian, which will be submitted for publication in the journal Közgazdasági Szemle. We plan to disseminate non-technical versions at various outlets.

A descriptive map has been prepared showing local (settlement) level coverage rates and activity rates of mothers as determined during the project. This map will be publicly available online on the website of the consortium partner, Hétfa Research Institute.