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Policy Impacts of Reimbursement Rate Reform: Evidence from the Child Care and Development Fund

Tiffany Wu
University of Southern California

Jade M. Jenkins
University of California, Irvine

Anamarie A. Whitaker
University of Delaware

The Child Care and Development Fund (CCDF) subsidizes child care costs for families with low-incomes. Reimbursements for cost-subsidized care are paid to child care providers but are extremely low compared with market rates and actual cost of care. We examine how the 2014 congressional reauthorization of CCDF, which recommended states increase subsidy reimbursement rates to the 75th percentile of market rates for care, affected the national supply and quality of child care. Using a triple difference design, we investigate the population-level characteristics of CCDF providers before and after the reauthorization using nationally representative data, state-submitted CCDF plans, and other state-level data. We find that only a handful of states reached the 75th percentile four years post-reauthorization indicating low compliance. Home-based providers in states meeting the 75th percentile threshold postreauthorization cared for 1.5 more preschoolers and were 49 percentage points (pp) more likely to offer nonstandard hours of care. In contrast, center-based providers in states that reached the 75th percentile post-reauthorization were 22pp less likely to provide nonstandard care hours, supplied .10 percent fewer subsidized child care slots, but were more likely to have a quality rating. Although small reimbursement increases benefited home-based providers, the overall impact on providers was minimal.

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Abstract

The Child Care and Development Fund (CCDF) subsidizes child care costs for families with low-incomes. Reimbursements for cost-subsidized care are paid to child care providers but are extremely low compared with market rates and actual cost of care. We examine how the 2014 congressional reauthorization of CCDF, which recommended states increase subsidy reimbursement rates to the 75th percentile of market rates for care, affected the national supply and quality of child care. Using a triple difference design, we investigate the population-level characteristics of CCDF providers before and after the reauthorization using nationally representative data, state-submitted CCDF plans, and other state-level data. We find that only a handful of states reached the 75th percentile four years post-reauthorization indicating low compliance. Home-based providers in states meeting the 75th percentile threshold post-reauthorization cared for 1.5 more preschoolers and were 49 percentage points (pp) more likely to offer nonstandard hours of care. In contrast, center-based providers in states that reached the 75th percentile post-reauthorization were 22pp less likely to provide nonstandard care hours, supplied .10 percent fewer subsidized child care slots, but were more likely to have a quality rating. Although small reimbursement increases benefited home-based providers, the overall impact on providers was minimal.

Keywords: state policy, child care, early childhood policy, triple differences

Policy Impacts of Reimbursement Rate Reform: Evidence from the Child Care and Development Fund

Child care subsidies help families with low-incomes access and pay for child care with the goal of supporting parental employment and education. The Child Care Development Fund (CCDF), a core component of U.S. social welfare, was authorized under the Child Care and Development Block Grant Act of 1990 (CCDBG) and represents the largest federal investment in child care, supporting roughly 1.4 million children each month (Office of Child Care, 2021a).[1] The CCDBG provides block grant funding to states and territories and imposes federal requirements in terms of minimum standards for child care (Federal Register, 2016). Like other social welfare programs, this allows for state flexibility while adhering to federal requirements. CCDF funds are paid to a third of child care providers nationwide (Slicker & Hustedt, 2022), and funds are used across different types of programs, such as community-based centers and licensed home-based care settings.

However, CCDF reimbursement rates are far lower than those of other government programs who reimburse third-party providers for essential services. For instance, Medicaid reimburses healthcare providers at 100% of the market rate for well-child and prenatal care visits (Centers for Medicare and Medicaid Services (2024).[2] By comparison, we calculate that only 7 states reimbursed child care providers at 75% of the market rate in 2019. CCDF rates do not cover tuition prices for nearly 60% of child care providers nationwide (Murrin, 2019). This

[1] CCDF expenditures totaled $10.3 billion in 2019 and served approximately 28% of children under the age of three, 28% for three to four-year-olds, and 10% for five-year-olds (Office of Child Care, 2021; Chien, 2021).
[2] Rates vary widely across states. For example, the monthly state base payment rate for California is approximately $1,970 and $600 in Mississippi (Schulman, 2021). These are based on center-based care for a one-year old child. Amounts are converted to 2025 dollars.

makes it difficult to offer access to care without passing additional costs onto families or reducing quality.

Although CCDF plays a central role in supporting low-income families' child care access, significant challenges persist in the child care landscape (Paschall et al., 2021). Child care is extraordinarily expensive, often amounting to more than families' housing and health care costs (Child Care Aware, 2021). By one estimate, families with incomes below 200% of the federal poverty level paying out of pocket allocate 35% of their income towards child care costs (Malik, 2019). Comparatively, middle-class families[3] spend 14% of their income on child care (Malik, 2019). Infant and toddler care is particularly cost-prohibitive, difficult to find, and lower in quality compared with preschool programs serving 3- and 4-year olds (Chaudry & Sandstrom, 2022).

Furthermore, CCDF reimbursement rates may critically affect the national supply and quality of child care. Survey evidence suggests that when states set reimbursement rates too low, fewer providers participate in CCDF (Murrin, 2019; National Center on Early Childhood Quality Assurance, 2020). Low reimbursement rates also constrain the quality of care that providers can offer, as payments often fall short of covering actual costs of care (Workman, 2021). This downward pressure on pricing limits access for the population of families who rely on subsidized care, with downstream effects on families' stable employment and their children's development (Burchinal et al., 2022).

The reauthorization of the CCDBG Act in 2014—the first major update to the CCDF in 25 years—introduced requirements aimed at helping families make informed child care decisions, improving the supply and quality of care, and improving payment practices for

[3] Middle-class families are defined here as families with incomes between 200%-299% of the federal poverty level.

providers (Office of Child Care, 2016). The reauthorization also aimed to improve rates by recommending that states increase reimbursements to the 75th percentile of market rates (Federal Register, 2016). However, the reauthorization did not provide additional funds for states in the reauthorization to meet this specific goal, leaving states on their own to meet new requirements.

We exploit this federal policy shift to investigate how changes to statewide reimbursement rates, specifically in states that reach the 75th percentile of market rates, affected the population of CCDF providers nationwide. We investigate this using a triple differences approach with a nationally representative sample of providers drawn in 2012 (pre-reauthorization) and 2019 (post-reauthorization). We examine outcomes for both center- and home-based providers (i.e., family child care homes, paid relative and non-relative care), the latter of whom are underrepresented in the literature despite supplying care for nearly as many 0-5 year olds as centers (Herbst, 2023; National Center for Education Statistics, 2021). Our study is the first to provide causal evidence on the impacts of increasing reimbursement rates on child care provider outcomes in the United States, with implications for other state welfare policies that reimburse third-party providers for essential social services.

CCDF Program and Reauthorization

Under the CCDF program, each state has the authority to establish its own child care policies, including the eligibility criteria, professional development standards, reimbursement rates, health and safety requirements, and early learning guidelines, resulting in over 50 different sets of CCDF policies nationwide.[4] The first reauthorization of CCDF since the 1996 Welfare reform came in the CCDBG Act of 2014. This legislation aimed to benefit families by improving

[4] For example, states determine family eligibility requirements for subsidies. Eligibility is generally based on working or student status, child's age, and household income, but varies widely across states; parents living in Kansas must work a minimum of 20 hours a week to qualify, while in California, there is no such requirement (CCDF Policies Database, 2019).

the health and safety standards of providers; improving the quality of care; increasing the access and supply of care, particularly for infants and toddlers, underserved communities (low-income areas), and families needing non-traditional care hours; and providing transparent child care provider information by maintaining a consumer education website on providers (Office of Child Care, 2016).

The 2014 reauthorization also benefited child care providers in two ways. First, the legislation required that reimbursements be paid to the provider in a timely manner.[5] Second, and the focus of this paper, the reauthorization attempted to address issues of penurious reimbursement by requiring that states set rates to ensure equal child care access for subsidy-eligible families. To promote equal access, this required states to certify the use of up-to-date market rate surveys or alternative methodologies to set payment rates, and recommended states set reimbursement rates to the 75th percentile or higher of market rates (Federal Register, 2016; Lynch, 2022; Office of Child Care, 2023). Reimbursement rates set at the 75th percentile benchmark range substantially across states depending on the cost of care. For example, the monthly 75th percentile threshold in California for infants in center care was approximately $1,600 in 2019; by comparison, it was only $480 in Mississippi. Despite the federal recommendation, 36 states reported challenges in meeting these requirements due to stagnant federal funding from 2014-2016 and decreasing state contributions (Administration for Children and Families, 2023; Murrin, 2019).

Child Care Provider Supply

[5] Prior to the reauthorization, providers faced problems with delayed subsidy payments, which affected the reliability of subsidy income streams and also led some providers to leave the subsidy system (Lin et al., 2020)

As Medicaid and Medicare are to health care providers, CCDF subsidy payments are a core revenue source for child care providers. They are reliable and help providers fill slots, even though they often limit the number of slots available to CCDF-funded children in favor of parent tuition-based slots (Adams et al., 2008). Studies of CCDF provider experiences reveal substantial confusion and burden with respect to application and renewal paperwork, payment dispute resolution, working with multiple CCDF agencies, and helping families navigate the subsidy system (Adams et al., 2022; Karolak & Mansfield, 2000; Rohacek, 2012; Sandstrom et al., 2018), creating significant problems for participating and complying with the program. These burdens, coupled with low reimbursement rates and an overburdened workforce, lead to overwhelm and exit from CCDF (Doromal et al., 2023; Washington & Reed, 2008). This forces providers to seek outside sources of financial support, such as grants or hosting fundraisers, to make up for the loss in revenue (Rohacek & Adams, 2017). Yet, despite low compensation and limited CCDF funding, providers continue to participate in the subsidy program; subsidies provide a steady source of funding, and providers are altruistically motivated to help the families whom subsidies support (Rohacek & Adams, 2017).

Supply issues are especially acute for families in low-income communities, parents who work nonstandard hours, and those with 0-5 year olds (Henly & Adams, 2018; Paschall et al., 2021); most providers are closed on weekends and do not offer care services past traditional hours (Enchautegui, 2013; Rachidi et al., 2019). Yet low-income workers make up the bulk of the labor force who work evenings, overnight, and weekends (Chaudry & Sandstrom, 2020; Enchautegui, 2013). Additionally, the cost of care for infants and toddlers is higher than for older age groups due to smaller teacher-child ratios, smaller group sizes, and material costs, making

finding care for younger children challenging. Taken together, these exacerbate inequities in the supply of high-quality centers in underserved areas and for low-income workers.

Child Care Provider Quality

Many studies underscore the importance of high-quality care, particularly for low-income families (NICHD Early Child Care Research Network, 2005). High-quality care is typically characterized by features of the classroom environment, such as low child-to-staff ratios and high educational standards (Dearing et al., 2009; Magnuson et al., 2007; van Huizen & Plantenga, 2018). However, CCDF families often use lower-quality care compared with non-subsidy recipients (Johnson et al., 2012; Ryan et al., 2011). Still, CCDF regulations affect not only children who directly receive subsidies but also other children who attend any CCDF-accepting provider.

Subsidy revenue supports a wide range of quality improvement efforts, such as maintaining low child-staff ratios, providing services to families, paying and maintaining qualified staff, and providing staff professional development opportunities. But high-quality care costs substantially more than business as usual; by one estimate, subsidies typically cover only 22% to 67% of the total cost (Schulman & Blank, 2017; Workman, 2021). Indeed the cost of a high-quality infant program is over $28,000 per child per year[6] (Workman, 2018), yet the average reimbursement rates were about $13,000 in 2019 (CCDF Policies Database, 2019). This large difference between reimbursement and the actual cost of supporting high-quality care places squeezes providers.

Present Study

[6] Dollar amounts are converted to 2019 dollars.

Quality child care that meets families' needs can support equitable opportunities for working families and may positively affect children's development. Although child care is a necessary condition for parental employment and education, CCDF is relatively understudied compared with other welfare programs (SNAP, Medicaid, EITC). Yet insights from CCDF policy have implications for other means-tested programs in understanding how reimbursement rates can improve the access and quality of social services delivered through private providers.

We investigate the population-level characteristics of CCDF providers before (2012) and after (2019) the reauthorization (2015), relative to non-CCDF providers within their own state and relative to states that did not increase reimbursement rates, in nationally representative samples of child care providers. We address the following research questions:

1) In how many states did the CCDF reimbursement rate reach the 75th percentile of market rates after the CCDBG reauthorization?
2) What is the impact of increasing CCDF reimbursement rates on the supply of child care providers (i.e., firms), and the supply of child care slots?
3) Do the child care outcomes of states with CCDF reimbursement rates at the 75th percentile of market rates meet the policy goals of the CCDBG reauthorization compared with states with CCDF reimbursement rates below the 75th percentile?

No studies have rigorously examined the impacts of the 2014 CCDBG reauthorization, or the effects of reimbursement rate policy changes. Though some states were still in the process of designing and implementing new post-reauthorization policies when the data were collected, outcomes measured in 2019 allow us to capture four years of policy implementation.

Theorized Impacts of the Reauthorization on Providers

By increasing provider revenue through higher reimbursement rates, we may expect improvements in the supply and quality of child care. A straightforward explanation is that increased revenue reduces providers' financial, administrative, and classroom resource constraints and increases capacity for enrollment and improvement, such as offering more hours of care (Adams et al., 2022). Correlational evidence points to the potential benefits of increasing reimbursement rates on child care quality (Greenberg et al., 2018; Rigby et al., 2007). Qualitative evidence from licensed providers in Oregon revealed that when reimbursement rates increased to the 75th percentile, providers reported greater economic stability and increased supply (e.g., subsidized enrollment slots) and quality investments for their programs (Scott et al., 2011). Together, findings from these studies indicate that increased CCDF reimbursements are likely to have a modest, positive impact on providers.

Alternatively, higher reimbursement rates may have no effect on child care supply and quality. Providers already face substantial financial deficits and resource constraints; the additional revenue may simply cover their existing operating deficits. In essence, the policy change may work as a shift towards more fair compensation resulting in no operating changes.

A third possibility is that providers will trade off between increasing the supply of child care slots or improving quality, but not both. CCDF providers could maintain the same number of CCDF-funded slots but generate higher revenue from subsidy payments after reimbursement rates increase, all while maintaining the same operations—i.e., not increasing the per-child administrative burdens of subsidy paperwork. Although reimbursement rates may have increased, rates are still staggeringly low compared with the true cost of care (see Appendix Table 2 of our results; Schulman & Blank, 2017; Workman, 2021), leaving providers to make difficult choices within their existing financial constraints. Recent causal evidence from Brown

and Herbst (2023) examining the effects of minimum wage increases on child care workers suggests that providers do indeed make such trade-offs. The authors leverage variation in state minimum wage laws in counties located across each side of a state border, finding that wage increases resulted in increased child-staff ratios and decreased capacity for subsidized slots, though other aspects of quality improved, including staff turnover and teacher-child interactions. These findings suggest that providers can respond to policy mandates in cost-saving ways that do and do not benefit families.

Methods

Data Sources

We combine four sources of data that include provider-level outcome variables, provider-level covariates, state-collected CCDF plans, and state-level covariates. Appendix Table 1 presents a summary of the data sources and related variables.

CCDF Policies

To determine state CCDF policies and reimbursement rate changes over the course of our study period, we collected CCDF state plans across all 50 states and Washington, D.C. CCDF state plans are completed by the lead state agency in charge of the CCDF program and include the state's plan for all CCDF-related services, submitted to the federal government every two to three years. We collected CCDF plans for fiscal years 2012-2013, 2014-2015, 2016-2018, and 2019-2021. Plans include information about subsidy eligibility, payments, safety regulations, professional development, reimbursement rates, and activities to improve the quality of child care. We searched online for publicly accessible CCDF plans from state websites for fiscal years 2012-2019. When state plans were not publicly available online, we contacted CCDF state agencies by email and phone. In most cases, we were able to obtain state plans and ultimately

collected 189 CCDF plans out of 204 possible (93% collected). The missing plans are largely because state agencies do not maintain records of CCDF plans for more than 10 years, or state CCDF agencies were unable to locate them.

Using these data, we focused on information relating to reimbursement and market rate conversion in the "Setting Payment Rates" section. We recorded the percentile of reimbursement rates for home-based and center-based providers separately and for three age groups: infants, toddlers, and preschoolers.[7] Over half of the states have rates based on geographic area, in which case we coded percentiles for the most populous areas of the state (i.e., urban areas). Most states determine market rates using a market rate survey conducted within two years of submission of the CCDF plan, though alternative methodologies are allowed, such as using cost estimation models (Coffey, 2023). We use this information to measure state shifts in reimbursement rates, as market-rate percentiles, in response to the CCDF reauthorization.

Provider-level Outcomes and Covariates

We use the National Survey of Early Care and Education (NSECE), funded by the Administration for Children and Families and collected by NORC at the University of Chicago. The NSECE used a multistage probability design to generate a nationally representative sample of early care and education providers across two waves, 2012 and 2019 (NSECE Project Team, 2021). We use these repeated, cross-sectional data to capture center- and home-based provider outcomes and covariates. We leverage the restricted-access version of these data which includes state identifiers. Appendix A provides more information on how the NSECE was collected.

Each wave comprises surveys of four populations: center-based providers, center-based workforce, home-based providers, and households with children under 13. We use four total

[7] CCDF state plans also include school-age children but are not included in the study.

surveys: the 2012 center provider, 2019 center provider, 2012 home-based provider, and 2019 home-based provider. Variables were harmonized across the 2012 and 2019 surveys. We exclude home-based providers who are both unpaid and relationship-based care as they would not be receiving CCDF dollars.

We also incorporate community-level data from the NSECE provided by the American Community Survey (ACS) for subgroup analyses. Community characteristics were created at the census-track level using 5-year ACS averages from 2005 to 2009 (NSECE Project Team, 2017) and 2013 to 2017 (NSECE Project Team, 2021) for the 2012 and 2019 NSECE datasets, respectively. Variables include information on poverty density, urbanicity, and populations for communities of color.

Our outcome variables are measured in 2012 and 2019. Ideally, we would prefer to have annual data measuring supply and quality in the periods before the CCDBG reauthorization. Because the NSECE only provides two years of data, we are unable to include more than one time period before the 2014 authorization. However, we aim to produce minimally biased estimates by supplementing our analyses with other sources of CCDF administrative data, which we discuss below.

State-level Covariates

We use the National Welfare Data from the University of Kentucky Center for Poverty Research for our state-level covariates. The dataset details various economic and political characteristics, such as population information, poverty rates, political party representation, and gross state product, and provides state-level longitudinal data from 1980 to 2020 (UKCPR, 2022). Additional state-level covariates come from the National Database of Child Care Prices

(Women's Bureau, 2020) and include information on state child care market prices, demographics, and labor market data.

We also leverage the CCDF Administrative Data on enrolled families and providers submitted by the states to ACF (ACF 801 data; Administration for Children and Families, 2022) to test the assumptions of our analytic model. The data contains details about CCDF families (e.g., reason for care), children (e.g., demographic information), child care settings (e.g., total payment made to the provider), and funding information (e.g., amount of child care funds provided) from federal fiscal years 2001 to 2019.

Sample

We test how the key policy changes aimed at improving provider payments through reimbursement rates affected the population of CCDF providers using the weighted, NSECE center-based provider surveys of 2012 and 2019 restricted to non-missing observations of providers who report CCDF funding and have state identifiers (N= 1,880 (2012); N= 2,200 (2019)). The home-based provider sample is restricted to providers who report CCDF funding, have state identifiers, and are neither unpaid nor relationship-based care (N= 2,400 (2012); N= 2,520 (2019). All N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per the confidentiality agreement with NORC.

Measures

Descriptive information by year for CCDF center and home-based providers is presented in Table 1.

Table 1 shows significant changes in CCDF providers from 2012 to 2019.[8] In 2019, CCDF centers cared for more children, served more preschoolers (3-5 year olds), and participated in the Quality Rating and Improvement System (QRIS) more. CCDF home-based providers trended in the opposite direction, caring for fewer children over time and fewer preschoolers.

[Table 1]

Provider Characteristics

Our provider outcomes are the measures of child care supply and quality available in the NSECE data that capture the aims of the reauthorization legislation. Specifically, these measures capture nonstandard hours of care, enrollment slots, and QRIS programs.

For centers, dichotomous measures (yes=1) include whether the center: serves infants/toddlers, serves preschoolers, is open for nonstandard hours, and has an overall quality rating (labeled QRIS). Continuous measures include: the total number of children cared for, the percentage of children funded by CCDF, and the center's average child-to-staff ratio (created by dividing the total number of children at a center by the total number of staff who work directly with children).

For home-based providers, supply variables include dichotomous indicators (yes=1) of whether the provider is open for nonstandard hours and whether the provider uses a curriculum/prepared set of learning activities. Continuous variables include: the average number of children cared for weekly (created using a restricted variable by adding the number of children cared for last week and additional number of children usually cared for); the number of regularly

[8] The data on providers from the NSECCE are cross-sectional data, highlighting the general landscape of provider changes across rather than tracking the same providers from 2012 to 2019.

cared for infants/toddlers; and the number of regularly cared for preschoolers. Unlike center outcomes, we did not include the percentage of children funded by CCDF due to the high missingness of the variable (over 70%).

Covariates

We include characteristics of the center director: whether the director holds a 4-year college degree and the total years of experience working with young children. We also include covariates that capture the program's funding sources, as many providers use multiple funding sources (Chaudry & Datta, 2017). Binary indicators (yes=1) are revenue: from the state or local government, the federal government, Head Start, and prekindergarten.

For home-based providers, binary covariate includes whether the provider holds a bachelor's degree. The continuous variable is the provider's years of experience.

We also include community characteristics for subgroup analyses for centers and home-based providers. This is relevant because child care subsidies play an important role in supporting low-income families and the reauthorization aimed at improving equity of services for children in underserved areas (Federal Register, 2016). Community variables included categorical variables of poverty density. For ease of interpretation, the poverty variable is dichotomized as whether the provider is in an area with high or low/medium poverty (low/medium poverty is the reference group). A provider is considered in an area with high poverty density if more than 20% of the weighted population is below the FPL.

State Characteristics

We use data collected from CCDF plans to determine the states that reached the 75th percentile of market rates, henceforth called *treated states* (1= treated). We did not obtain 2016-2018 CCDF plans for Michigan, and D.C. did not list reimbursement rate percentiles on their CCDF

plans; therefore, Michigan and D.C. are excluded from the analyses. CCDF plans for 2016-2018 indicated that every treated state began treatment in fiscal year 2016. We also reviewed CCDF plans before 2016 to verify that treatment began only in 2016 and not before.

We also include a set of time-varying, state-level covariates for all analyses representing state political, social, and economic characteristics to capture trends that change over time within states. Variables included are the unemployment rate, poverty rate, the fraction of the State Senate that is Democrat, Temporary Assistance for Needy Families (TANF) per capita, gross state product (GSP) per capita, percent of the population that identifies as Hispanic or Latinx, and percent of the population that identifies as white or Caucasian.

Empirical Model

Evaluating the Effects of State Reimbursement Rate Policy Changes

We use a triple difference (DDD) design to answer our study research questions. This approach allows us to compare provider outcomes before and after the reauthorization as the first difference, with comparisons of providers in treated (states that increased reimbursement rates to the 75th percentile) versus untreated states as the second difference, and comparison of CCDF to non-CCDF providers as the third difference. The DDD design is well-suited for our context because it isolates the effect of the reimbursement rate change on the subgroup of child care providers affected by the policy change—CCDF providers in treated states in the post-treatment period—while controlling for broader trends in time, geography and the child care sector. This is an increasingly popular approach in policy evaluation when there are groups that are treated (states) and subgroups (within the states) that are directly affected by the treatment (CCDF providers) (Ortiz-Villavicencio & Sant'Anna, 2025). A key advantage of the DDD approach over a standard difference-in-differences (DID) design is its ability to address potential biases that

arise when control groups are not perfectly comparable (Berck & Villas-Boas, 2015). For instance, comparison states that did not increase their reimbursement rates may still differ systematically from treated states in ways that affect provider outcomes. This makes DDD a more robust alternative to DID designs in this policy context.

There are also likely differences *across* states that are correlated with whether states increase reimbursement rates, such as the generosity of a state's government or political preferences. We use state fixed effects to limit variation to within-state changes to control for time-invariant differences across states, and control for time-varying state characteristics (Angrist & Pischke, 2008). The fixed effects model yields a valid and reliable estimate of the impacts in a static DID model (when states are treated at the same time) with exactly two periods (in our case, years 2012 and 2019; Callaway 2022; Roth et al., 2023).

Our most comprehensive specification is as follows:

$$Y_{ij} = \alpha + \beta_1 CCDF_{ij} + \beta_2 2019 + \beta_3 Treated_j + \beta_4\left(CCDF_{ij} * 2019\right) + \beta_5\left(CCDF_{ij} * Treated_j\right) + \beta_6\left(2019 * Treated_j\right) + \beta_7\left(CCDF_{ij} * 2019 * Treated_j\right) + X_j + Z_i + \theta_j + \epsilon_j$$

where β_7, our parameter of interest, is the estimate of the reimbursement rate percentile on outcome Y (i.e., supply and other measures related to the reauthorization aims), the average treatment effect for provider *i* in state *j.* Providers surveyed in the 2012 NSECE serve as the baseline "pre" measure and providers surveyed in the 2019 NSECE are the "post" assessments. $CCDF_{ij}$ represents providers in a state that accepts CCDF subsidies. $Treated_j$ denotes the binary treatment status of each state (i.e., whether the state reached the 75th percentile of market rates) and is time-varying. Because fixed effects do not control for time-varying characteristics, we include X_j in our analytic model as time-varying state covariates. Z_i denotes center-level

covariates. θ are state fixed effects that control for all time-invariant characteristics of states. We include design-corrected standard errors by the NSECE team to account for the complex, stratified design of the data. NSECE population weights are also applied to all analyses.

Assumptions

Parallel Trends

Our triple differences approach relies on the parallel trends assumption (Granger, 1969) whereby outcomes of the treatment and control group follow the same trends in the treatment state compared with outcomes of the treatment and control group in the untreated state (Olden & Møen, 2022). Our ideal counterfactual would be to compare CCDF against non-CCDF centers prior to the reauthorization in treated and untreated states. However, we cannot directly test the parallel trends assumption because we do not have multiple waves of data on our focal outcomes prior to the reauthorization.[9] We can compare the trends of CCDF centers only, in both treated compared and untreated states, to demonstrate that reimbursement payments are similar for both groups prior to the 2014 reauthorization.

We leverage CCDF administrative data to test for proxies of our outcome measures—subsidy reimbursement payments paid to CCDF providers, not including co-payments. Reimbursements are adjusted to real 2019 dollars and scaled to every $100. We used subsidy payments as a signal of states' willingness to comply with the reauthorization requirements. This allows us to compare whether trends from the treatment group differ from the untreated group prior to the reauthorization and if pre-treatment coefficients are statistically zero.

[9] No other data exists that capture child care provider-level data that can identify subsidy-receiving center and home-based providers.

We conducted an event study using these data (Granger, 1969) from federal fiscal years 2011 to 2019, shown in Figure 1, to capture the trends in reimbursement amounts pre- and post-reauthorization.[10] We use information coded from CCDF state plans to identify the state treatment status.[11] We centered the year relative to the CCDBG reauthorization policy change, 2015. The specification includes state fixed effects and standard errors clustered at the state level.

The event study coefficients for untreated states range from -.03 to .03 and -.04 to .04 for treated states and were all insignificant. This suggests that there are no significant differences between treated and untreated states in the reimbursements CCDF providers received prior to the CCDF reauthorization. Post-treatment, there is an immediate and gradual increase in reimbursements post-reauthorization for both groups. This provides strong evidence that CCDF centers across treated and untreated states were comparable in terms of the payments they received during the pre-authorization period, and that increases in payments only occurred after the reauthorization.

[Figure 1]

Balance Testing

We also test whether state characteristics, and providers in treated and untreated states, were similar on observables prior to the 2014 reauthorization. Balance tests for center-based providers are displayed in Appendix Table 4 and Appendix Table 5 for home-based providers.

For centers, of the 13 center and state-level covariates, 6 are statistically significant:

[10] Years before 2011 are excluded because payment amounts before 2011 are recorded differently than payments in 2011 and onwards.

[11] We use information from the center-based, toddler/preschooler age group to identify state's treatment status. The event study is robust to provider type (center and home-based) and age group (infant, toddler, and preschool).

whether a center is a Head Start Center, the director's years of experience working with children, GSP per capita, the fraction of State Senate Democrats, state poverty rate, and the state percentage of Hispanic/Latinx. For home-based providers, 3 out of 10 covariates are statistically significant: GSP per capita, ratio of TANF, and state's Hispanic/Latinx population. Overall, the magnitude of the difference in means is relatively small for both providers. For centers, there are only small differences in the provider characteristics. The largest difference is for the state population of Hispanic/Latinx at 3.22%. For home-based providers, the differences are nearly 0, though the difference in the state percent of Hispanic/Latinx is also slightly larger in non-treated states (5%). While the states' demographics may be slightly different, this is of smaller concern because the political and economic characteristics between treated and non-treated states are extremely small.

No Anticipation

We also examine the no anticipation assumption– whether the treatment, changes in reimbursement rates, had an impact on states before the actual reauthorization year (Abbring & van den Berg, 2003). Because we only observe two years of the data prior to the reauthorization, we cannot shift the treatment year to test for a policy effect before the policy was implemented. Instead, we test this assumption by examining state CCDF plans for treated states to observe whether they increased their reimbursement rates prior to the reauthorization. In the CCDF plans, we find no concerns for violations of the no anticipation assumption. Details are described in Appendix B.

Results

States That Reached the 75th Percentile of Market Rates

Based on an analysis of CCDF state plans, we find that 8 states set reimbursement rates to the 75th percentile of market rates or higher for center-based, infant groups: Arkansas, Delaware, Montana, New Mexico, Oregon, South Carolina, South Dakota, West Virginia. For toddlers and preschooler age groups, the same 7 states were treated. The treated states are identical to the infant age group, with the exclusion of New Mexico. Descriptive information listing reimbursement rate percentiles for center providers and each age group, along with a list of treated states, is in Appendix Table 2. Appendix Figure 1 details a color-coded map for the center-based, toddler and preschooler age group of reimbursement rate percentiles for each state.

For home-based providers, 7 of the same states set reimbursements to the 75th percentile for the infant, toddler, and preschooler age group: Arkansas, Delaware, Montana, Oregon, South Carolina, South Dakota, and West Virginia. Appendix Table 3 lists the reimbursement percentiles for home-based providers, and Appendix Figure 2 provides a corresponding map.

Impact of Reimbursement Rates on Providers

Center-based Providers

Table 2 depicts the main results for the toddler/preschooler age group and answers our main research questions: What is the impact of increasing reimbursement rates on the supply of child care providers, and the supply of child care slots (columns 1-4)?; and, Do the child care outcomes of states with CCDF reimbursement rates at the 75th percentile of market rates meet the policy goals of the CCDBG reauthorization compared with states with rates below the 75th percentile? (columns 5-7)? Each column shows a separate outcome and regression. Figure 2 shows the results for the DDD estimates.

[Table 2]

[Figure 2]

DDD estimates of CCDF child care supply (columns 1-4) and quality goals of the reauthorization (columns 5-7) indicate that some measures improved while others did not. CCDF centers in treated states in the post-reauthorization period (i.e., the triple difference coefficient) had .10 percent fewer CCDF-funded slots, but were 6 pp more likely to serve preschoolers, though this was only marginally significant. Centers were 22 pp less likely to be open for nonstandard hours of care but were 28 pp more likely to have a quality rating. For brevity, results for the infant age group are shown in Appendix Table 6 and Appendix Figure 3. Results for the infant group reveal a similar pattern to the toddler and preschooler group. Overall, we find decreases in subsidized child care slots and nonstandard hours care offerings.

Home-based Providers

Figure 3 shows the DDD results for home-based providers with estimates shown in Table 3. Columns 1-3 are outcomes for measures of supply, and columns 4-5 are outcomes related to the goals of the reauthorization. The same states reached the 75th percentile across all three age groups.

[Figure 3]

[Table 3]

DDD results suggest that CCDF home-based providers in states that reached the 75th percentile in post-reauthorization cared for 1.4 more preschoolers. Home-based providers were 49 pp more likely to provide nonstandard hours of care, though this was marginally significant. By comparison, centers were 20-22 pp less likely to provide nonstandard care hours. Taken together, centers generally decreased supply while home-based providers expanded supply.

Heterogeneous Impacts

The main effects suggest that increased reimbursement rates led centers to cut back on CCDF-funded child care slots and nonstandard hours of care, but with home-based providers offering more preschool slots and nonstandard care hours. We now examine whether the policy change had differential impacts on communities with high poverty, which was a core aim of the legislation.

DDD estimates for subgroup analyses are presented in Table 4. We find that CCDF centers in areas with high poverty levels cared for nearly 33 more children in the toddler/preschooler age group in the post-authorization period, though the percentage of children funded by CCDF trended downward (not reaching statistical significance). Additionally, centers in these areas were also 18 pp less likely to open for nonstandard hours post-reauthorization. This indicates that centers are offering additional non-subsidized child care slots but cutting back on other services such as operating hours and having a QRIS rating suggests that supply and quality were falling short of the reauthorization goals. Findings for the center-based infant age group underscore a similar pattern, shown in Appendix Table 7.

[Table 4]

Table 5 shows that home-based providers in areas with high poverty levels are 32 pp significantly less likely to use a curriculum post-reauthorization. These providers also cared for fewer preschoolers and children in general, though these estimates did not reach statistical significance. These findings suggest that the positive impacts we observed in the main results on caring for more preschoolers and offering more nonstandard care hours by home-based providers are driven by providers in areas of low poverty, and providers in areas of high poverty generally reduced their supply and quality of services.

[Table 5]

Robustness and Sensitivity Checks

Continuous Measure of Reimbursement Rate Changes

We ran the same DDD specification, but we test the impact of $100 increases in reimbursement rates on the same set of center-based provider outcomes. Results are similar to those from our main analyses. We find that a $100 increase in reimbursement rates in the post-reauthorization period led to .01 percent fewer children funded by CCDF. However, we do not observe changes in whether centers are open for nonstandard hours and whether a program has a QRIS rating. Details are available in Appendix C.

Changing Threshold to the 50th Percentile of Market Rates

Although the recommendation of federal CCDF policy is for state reimbursements to be set at the 75th percentile of the market rate, our first set of results reveal that very few states follow this guidance (see Appendix Tables 1 and 2). Therefore, we tested whether other thresholds would capture additional "treated" states, examining the possibility of some form of dose-response relationships. In this way, we might expect smaller or non-existent impacts at the 50th percentile. Using the 50th percentile threshold, we find that 11-15 additional new states are treated for center-based providers, depending on the age group, and 16-20 additional states are treated for home-based providers.

Results, shown in Appendix D, indicate a similar pattern of results compared with the 75th percentile where the supply and services are largely being cut back as reimbursements increase for centers. For home-based providers, the magnitude of impacts decreases at the 50th percentile compared with the 75th percentile, suggesting a positive story: the supply and services of child care for home-based providers are increasing as home-based providers receive higher reimbursement rates.

Conclusion

The CCDF program is a fundamental component of welfare policy that allows low-income families to secure affordable and high-quality child care. Understanding the impacts of CCDF reimbursement changes is essential, as these rates directly influence the supply and quality of care provided to families (Rohacek et al., 2010) and can have implications for other means-tested programs that operate similarly to CCDF. Our study is the first to estimate the impacts of reimbursement rate policy changes on the supply and quality of care for both centers and home-based providers using a quasi-experimental design.

Our analysis of CCDF plans revealed that only 7-8 states, depending on care type (home or center-based), were able to reach the 75th percentile threshold of the market rate soon after the 2014 reauthorization. Such findings may not be surprising given the decrease in state CCDF funding over time, despite increased federal CCDF funding (Administration for Children and Families, 2023). And while total CCDF expenditures have increased from 2000 to 2019 ($8.3 billion to $10.5 billion adjusted to 2019 dollars; Administration for Children and Families, 2023), funding for the CCDF program is still low compared with the actual cost of supporting child care provider services. In turn, providers likely change the services they offer to better match what they are paid. The below-market payments for services in the CCDF program and goals to increase such payments pose a significant challenge to reach policy aims like promoting parental employment (Davis et al., 2018). Our findings underscore the need for increased federal CCDF allocations to support states meeting federal recommendations.

The main DDD results reveal mixed findings on the impacts of increased reimbursement rates for subsidized children for center- and home-based providers. Home-based providers cared for nearly 1.5 more preschoolers in the post-reform period and offered more nonstandard hours

of care, indicating that increased reimbursement rates increased families' access to home-based providers. In contrast, center-based providers supplied fewer CCDF-funded slots and were less likely to open for nonstandard hours of care across states that reached the 75th percentile post-reauthorization, reducing access for low-income families. Examining the reimbursement rate increase to the 50th percentile of the market rates showed a similar pattern with smaller effect sizes. This suggests that centers may be prioritizing the provision of quality care over increasing their supply of CCDF-funded slots, whereas home-based providers have moved in the opposite direction.

Findings from the subgroup analyses suggest even more discouraging results, whereby centers in treated states in areas with high poverty, compared with areas with low/moderate poverty, are also less likely to open for nonstandard hours of care across all age groups and did not expand CCDF slots. Results for home-based providers show decreases in the likelihood of a provider using a curriculum and decreases in the number of children cared for. These findings highlight that access to center and home-based providers is more limited in areas with high poverty.

Such limited results from a landmark piece of legislation for our nation's largest child care program pose several, critical questions. It is possible that the reauthorization was not as effective at improving child care quality and supply because too few states complied with the federal recommendation—those that were "treated"—within this time. Indeed, we found that only 7-8 states reached the 75th percentile of the market rate by federal fiscal year 2018. Even as of 2022, only 18 states met or exceeded the recommended 75th percentile for center-based infant care and 20 states for home-based infant care, with some states paying as low as the 21st percentile of market rates (Coffey, 2023).

States likely need additional funding to support investments in increasing the supply and quality of care (Banghart et al., 2019; Lin & Maxwell, 2021). It is estimated that subsidies only cover 22% to 67% of the total cost of high-quality care (Schulman & Blank, 2017; Workman, 2021), and rates will need to be drastically increased to match the true cost of care. Ideally, we could estimate the impacts on the supply and quality of child care when rates were set at the market rate, but too few states surpassed the 75th percentile benchmark. Furthermore, the market rate surveys that states use to determine child care prices have been criticized for their inflexibility to future economic changes and perpetuating the low wages of child care workers, relative to alternatives like cost modeling (Coffey, 2023).

The new reauthorization requirements also increased the already considerable commitment asked of CCDF providers, including stricter health and safety requirements, which could further disincentivize the participation of existing (overburdened) CCDF providers (Institute of Medicine and National Research Council, 2015). Although some components of the reauthorization aimed to reduce burdens and improve payment administration, it is unclear whether these new regulations would reduce the barriers for provider entry into the CCDF program.

Our results also indicate that centers in states that reached the 75th percentile post-reauthorization were significantly more likely to participate in QRIS. QRISs are designed to promote higher quality child care through its rating system by offering quality benchmarks, support services to providers, and financial incentives (Caron et al., 2017). Many states require QRIS participation to obtain higher, or tiered, reimbursement rates. A national report of QRIS programs shows that a quarter of the treated states in our analyses included this requirement (The Build Initiative & Child Trends, 2024). This suggests that moving to the 75th percentile

benchmark may be encouraging more participation in QRIS programs, although this may be in part due to the reauthorization mandate to provide parents with information on child care options that partially operate through QRIS (Herbst, 2023).

We note several limitations to our study. There are many additional outcomes downstream from reimbursement rates that would be valuable to examine, such as classroom process quality, maternal employment, and child well-being that we did not have the data to examine but should be investigated in future studies. We also note that reimbursement rates vary within states, and our analyses focused on using the majority rate in the most populous areas, which are typically urban areas. Therefore, we cannot generalize our findings to less populous areas.

Helping families afford child care has been the topic of much political and media interest in recent years (Jamieson & Perez, 2023; Perera, 2023). While we find that increasing reimbursement rates for home-based providers likely led to increased child care access for low-income families, it is unclear why centers decreased their supply of care. Because providers already operate on razor-thin margins and financial deficits (Workman, 2021), it is not likely that small increases in reimbursements would lead to substantial improvements in child care, particularly in how providers operate. For instance, asking providers to provide more accessible hours overnight or on weekends would drastically change how providers operate and require a substantial amount of money to cover operating costs and staff compensation. It may also be unlikely to expect significant changes with respect to the increase in reimbursement rates compared with the real cost of supporting high-quality programs. The estimated difference between current reimbursement rates and the actual cost of care (Workman, 2018) highlights the significant gap to be addressed. In contrast to other essential services in Medicaid, where

providers are reimbursed at 100% of the market rate for well-child visits, CCDF reimbursement rates are extremely disproportionate to the actual cost of care.

Our study sheds light on how different aspects of child well-being are prioritized and funded within the U.S. social welfare system. This research contributes to a limited but growing literature on the CCDF program. Our findings highlight new insight into how reimbursements in means-tested programs like CCDF can impact providers' ability to increase or not access to high-quality care for families. Understanding ways social welfare policies can improve essential child care services for the 1.4 million children relying on monthly subsidy support has important consequences for families' employment and educational opportunities (Burchinal et al., 2022). Though the CCDF program is not as comparatively large as other targeted programs such as Medicaid, its importance as the primary and largest source of child care funding for low-income families makes it a critical social welfare program in the U.S. policy landscape, supporting workforce participation, child development, and economic stability for millions of families.

References

Abbring, J.H. & van den Berg, G.J. (2003). The nonparametric identification of treatment effects in duration models. *Econometrica, 71*(5), 1491–1517.

Adams, G., Luetmer, G., & Todd, M. (2022). *Using child care subsidy payment rates and practices to incentivize expansions in supply.* Urban Institute. https://www.urban.org/sites/default/files/2022-09/Using%20Child%20Care%20Subsidy%20Payment%20Rates%20and%20Practices%20to%20Incentivize%20Expansions%20in%20Supply.pdf

Adams, G., Rohacek, M. H., & Snyder, K. (2008). *Child care voucher programs: Provider experiences in five counties*. https://www.urban.org/research/publication/child-care-voucher-programs-provider-experiences-five-counties

Administration for Children and Families. (2021). *Family Copayment Contribution*. https://childcareta.acf.hhs.gov/ccdf-fundamentals/family-copayment-contribution

Administration for Children and Families. (2022). *Child Care and Development Fund Administrative Data*. https://www.childandfamilydataarchive.org/cfda/archives/cfda/studies/4379

Administration for Children and Families. (2023). *Child Care and Development Fund Expenditure Data: List of all Years. https://www.acf.hhs.gov/occ/data/child-care-and-development-fund-expenditure-data-list-all-years*

Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricists companion*. Princeton University Press.

Auger, A., Farkas, G., Burchinal, M. R., Duncan, G. J., & Vandell, D. L. (2014). Preschool center care quality effects on academic achievement: An instrumental variables analysis.

Developmental Psychology, *50*(12), 2559–2571. https://doi.org/10.1037/a0037995

Banghart, P., King, C., Bedrick, E., Hirilall, A., & Daily, S. (2019). *State Priorities for Child Care and Development Block Grant Funding Increase: 2019 National Overview*. Child Trends. https://cms.childtrends.org/wp-content/uploads/2019/09/CCDBGFunding_ChildTrends_October2019.pdf

Berck, P. & Villas-Boas, S.B. (2015). A note on the triple difference in economic models. *Applied Economics Letters, 23*(4), 239–242.

Brown, J.H. & Herbst, C.M. (2023). *Minimum wage, worker quality, and consumer well-being: Evidence from the child care market* (IZA Discussion Papers, No. 16257) Institute of Labor Economics (IZA), Bonn. https://www.econstor.eu/bitstream/10419/278955/1/dp16257.pdf

Burchinal, M., Whitaker, A.A., & Jenkins, J.J. (2022). The promise and purpose of early care and education. *Child Development Perspectives, 16*, 134–140. https://doi.org/10.1111/cdep.12463

Callaway, B. (2022). Difference-in-differences for policy evaluation. *Handbook of Labor, Human Resources and Population Economics*, 1–61.

Campbell, F. A., Pungello, E. P., Kainz, K., Burchinal, M., Pan, Y., Wasik, B. H., Barbarin, O. A., Sparling, J. J., & Ramey, C. T. (2012). Adult outcomes as a function of an early childhood educational program: An Abecedarian Project follow-up. *Developmental Psychology*, *48*(4), 1043. https://doi.org/10.1037/A0026644

Campbell, F. A., & Ramey, C. T. (1994). Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development*, *65*, 684–698. https://doi.org/10.1111/J.1467-8624.1994.TB00777.X

Caron, B., Kendall, R., & Wilson, G. (2017). *Taking on the challenge: Building a strong*

foundation for early learning. Early learning challenge summary report. Early Learning Challenge Technical Assistance

CCDF Policies Database. (2019). The Urban Institute. https://ccdf.urban.org/about-us

Centers for Medicare and Medicaid Services (2024). *Early and periodic screening, diagnostic, and treatment.* Medicaid.gov. https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html

Chaudry, A. & Datta, R. (2017). The current landscape for public pre-kindergarten programs. In *The current State of scientific knowledge on pre-kindergarten effects* (K.A.D.D. P). Brookings Institution and Duke University.

Chaudry, A. & Sandstrom, H. (2020). Child care and early education for infants and toddlers. *The Future of Children*, *30*(2), 165–190. https://www.jstor.org/stable/27075020

Chien, N. (2021). *Factsheet: Estimates of child care eligibility & receipt for fiscal year 2018*. https://aspe.hhs.gov/estimates-

Child Care Aware (2021). *2021 Child care affordability analysis.*

Coffey, M. (2023). *States can improve child care assistance programs through cost modeling.* Center for American Progress. https://www.americanprogress.org/article/states-can-improve-child-care-assistance-programs-through-cost-modeling/

Davis, E. E., Carlin, C., Krafft, C., & Forry, N. D. (2018). Do child care subsidies increase employment among low-income parents? *Journal of Family and Economic Issues*, *39*, 662–682. https://doi.org/10.1007/s10834-018-9582-7

Dearing, E., McCartney, K., & Taylor, B. A. (2009). Does higher quality early child care promote low-income children's math and reading achievement in middle childhood? *Child Development*, *80*(5), 1329–1349. https://doi.org/10.1111/J.1467-8624.2009.01336.X

Doromal, J., Michie, M., & Weisney, K. (2023). *Why child care providers don't participate in subsidy programs: Insights from a statewide survey of non-participating providers.* SEE-Partnerships at the University of Virginia

Enchautegui, M. E. (2013). *Nonstandard work schedules and the well-being of low-income families.* Urban Institute. https://www.urban.org/research/publication/nonstandard-work-schedules-and-well-being-low-income-families

Federal Register. (2016). *Child Care and Development Fund (CCDF) Program*. https://www.federalregister.gov/documents/2016/09/30/2016-22986/child-care-and-development-fund-ccdf-program

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, *37*(3), 424–438.

Greenberg, E., Isaacs, J.B., Derrick-Mills, T., Michie, M., & Stevens, K. (2018). *Are higher subsidy payment rates and provider-friendly payment policies associated with child care quality?* Urban Institute. https://www.urban.org/sites/default/files/publication/96681/are_higher_subsidy_payment_rates_and_provider-friendly_payment_policies_associated_with_child_care_quality_2.pdf

Havnes, T., & Mogstad, M. (2011). No child left behind: Subsidized child care and children's long-run outcomes. *American Economic Journal*, *3*(2), 97–129. https://www.jstor.org/stable/pdf/41238095.pdf

Henly, J.R. & Adams, G. (2018). *Increasing access to quality child care for four priority populations.* Urban Institute. https://www.urban.org/sites/default/files/publication/99150/increasing_access_to_quality_c

hild_care_for_four_priority_populations_report_3.pdf

Herbst, C.M. (2023). Child care in the United States: Markets, policy, and evidence. *Journal of Policy Analysis and Management, 42*(1), 255–304. https://doi.org/10.1002/pam.22436

Jamieson, C. & Perez, Z. (2023). *Governors' top education priorities in 2023 State of the State Addresses.* Education Commission of the States.

Johnson, A. D., Ryan, R. M., & Brooks-Gunn, J. (2012). Child-care subsidies: Do they impact the quality of care children experience? *Child Development*, *83*(4), 1444–1461. https://doi.org/10.1111/j.1467-8624.2012.01780.x

Karolak, E. J., & Mansfield, S. R. (2000). *A study of the child care payment system in Ohio pursuant to AM. Sub. H.B. 283*. https://www.lsc.ohio.gov/assets/organizations/legislative-service-commission/files/2000-2009-special-reports-a-study-of-the-child-care-payment-system-in-ohio-pursuant-to-am-sub-hb-283.pdf

Lin, V. & Maxwell, K. (2021). *State and Territory Child Care and Development Fund (CCDF) Investments in Early Care and Education Quality,* OPRE Report #2021-63, Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/documents/opre/state-and-territory-child-care-apr-2021.pdf

Lin, V., Maxwell, K., Daily, S., & Stepleton, K. (2020). *Initial Implementation of the 2014 Reauthorization of the Child Care and Development Block Grant*, OPRE Report #2020-111, Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/documents/opre/Initial_implementation.pdf

Lynch, K.E. (2022). *The Child Care and Development Block Grant: In Brief. (R47312).* https://crsreports.congress.gov/product/pdf/R/R47312

Magnuson, K. A., Ruhm, C., & Waldfogel, J. (2007). The persistence of preschool effects: Do subsequent classroom experiences matter? *Early Childhood Research Quarterly*, *22*(1), 18–38. https://doi.org/10.1016/j.ecresq.2006.10.002

Malik, R. (2019). *Working families are spending big money on child care.* https://www.americanprogress.org/article/working-families-spending-big-money-child-care/

Minton, S., Giannarelli, L., Dwyer, K., Tran, V., & Kwon, D. (2020). *Child Care and Development Fund (CCDF) Policies Database*. https://www.childandfamilydataarchive.org/cfda/archives/cfda/studies/37468/publications

Murrin, S. (2019). *States' payment rates under the Child Care and Development Fund Program could limit access to child care providers* (OEI-03-15-00170). https://oig.hhs.gov/oei/reports/oei-03-15-00170.pdf

National Center for Education Statistics. (2021). *Early Childhood Program Participation: 2019*. U.S. Department of Education. https://nces.ed.gov/fastfacts/display.asp?id=4

National Center for Education Statistics. (2022). Price of Attending an Undergraduate Institution. In *U.S. Department of Education, Institute of Education Sciences*. National Center for Education Statistics.

National Center on Early Childhood Quality Assurance (2020). *Addressing the decreasing number of family child care providers in the United States*. https://childcareta.acf.hhs.gov/sites/default/files/addressing_decreasing_fcc_providers_revised_march2020_final.pdf

NICHD Early Child Care Research Network. (2005). Early child care and children's

development in the primary grades: Follow-up results from the NICHD study of early child care. *American Educational Research Journal*, *42*(3), 537–570.

NSECE Project Team. (2021). *National Survey of Early Care and Education*. NORC. https://www.norc.org/Research/Projects/Pages/national-survey-of-early-care-and-education.aspx

Office of Child Care. (2016). *Child Care and Development Fund final rule frequently asked questions*. U.S. Department of Health and Human Services, Administration for Children and Families. https://www.acf.hhs.gov/occ/faq/child-care-and-development-fund-final-rule-frequently-asked-questions

Office of Child Care. (2021a). *Characteristics of families served by the Child Care and Development Fund (CCDF) based on preliminary FY2019 data | The Administration for Children and Families*. Administration for Children and Families. https://www.acf.hhs.gov/occ/fact-sheet/characteristics-families-served-child-care-and-development-fund-ccdf-based

Office of Child Care. (2023). *Child Care and Development Fund reauthorization*. Administration of Children and Families. https://www.acf.hhs.gov/occ/ccdf-reauthorization

Olden, A. & Møen, J. (2022). The triple difference estimator. *The Econometrics Journal, 25*(3), 531-553. https://doi.org/10.1093/ectj/utac010x

Ortiz-Villavicencio, M., & Sant'Anna, P. H. (2025). Better Understanding Triple Differences Estimators. *arXiv preprint arXiv:2505.09*

Paschall, K., Davis, E. E., & Tout, K. (2021, February). *Measuring and comparing multiple dimensions of early care and education access*. https://www.acf.hhs.gov/sites/default/files/documents/opre/CCEEPRA-measuring-access-

february-2021.pdf

Perera, R.M. (2023). *State of the States: Governors and PK-12 education policy.* Brookings Institution.

Rachidi, A., Sykes, R., Desjardins, K., & Chaisez, J.C. (2019). *The new economy and child care: Nonstandard-hour work, child care, and child health and well-being.* Mathematica and American Public Human Services Association. https://www.mathematica.org/publications/the-new-economy-and-child-care-nonstandard-hour-work-child-care-and-child-health-and-well-being

Rigby, E., Ryan, R.M., & Brooks- Gunn, J. (2007). Child care quality in different state policy contexts. *Journal of Policy Analysis and Management, 26*(4), 887–908. https://doi.org/10.1002/pam.20290

Rohacek, M. (2012). *A summary of research on how CCDF policies affect providers*. Urban Institute. https://www.urban.org/sites/default/files/publication/25451/412578-A-Summary-of-Research-on-How-CCDF-Policies-Affect-Providers.PDF

Rohacek, M., & Adams, G. (2017). *Providers in the child care subsidy system: Insights into factors shaping participation, financial well-being, and quality*. https://www.urban.org/research/publication/providers-child-care-subsidy-system

Rohacek, M., Adams, G.C., & Kisker, E.E. (2010). *Understanding quality in context: Child care centers, communities, markets, and public policy.* Urban Institute. https://www.urban.org/sites/default/files/publication/29051/412191-Understanding-Quality-in-Context-Child-Care-Centers-Communities-Markets-and-Public-Policy.PDF

Roth, J., Sant'Anna, P.H.C., Bilinski, A., & Poe, P. (2023). What's trending in difference-in-differences? A synthesis of the recent econometrics literature. *Journal of Econometrics,*

235(2)*,* 2218–2244. https://doi.org/10.48550/arXiv.2201.01194

Ryan, R. M., Johnson, A., Rigby, E., & Brooks-Gunn, J. (2011). The impact of child care subsidy use on child care quality. *Early Childhood Research Quarterly*, *26*(3), 320–331. https://doi.org/10.1016/J.ECRESQ.2010.11.004

Sandstrom, H., Coffey, A., Henly, J., Bromer, J., Spalding, A., Thomas, W., Greenberg, E., & Derrick-Mills, T. (2018). *Learning from child care providers across settings: A critical step to improving the quality and stability of subsidized care*. https://www.researchconnections.org/childcare/resources/37072

Schulman, K. (2021). *On the precipice: state child care assistance policies 2020*. https://nwlc.org/resource/on-the-precipice-state-child-care-assistance-policies-2020/

Schulman, K., & Blank, H. (2017). *Persistent gaps: State child care assistance policies 2017*. https://nwlc.org/wp-content/uploads/2017/10/NWLC-State-Child-Care-Assistance-Policies-2017-1.pdf

Scott, E.K., Leymon, A.S., & Abelson, M. (2011). *Assessing the impacts of Oregon's 2007 changes to child-care subsidy policy.* https://cassites.uoregon.edu/sociology/wp-content/uploads/sites/10/2016/04/Child-care-report-2011-27znhco.pdf

Slicker, G., & Hustedt, J. T. (2022). Predicting participation in the child care subsidy system from provider features, community characteristics, and use of funding streams. *Children and Youth Services Review*, *136*, 106392. https://doi.org/10.1016/J.CHILDYOUTH.2022.106392

The Build Initiative & Child Trends. (2024). A Catalog and Comparison of Quality Initiatives (Data System). http://qualitycompendium.org/.

UKCPR. (2022). *UKCPR National Welfare Data, 1980-2020*.

van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care? A meta-analysis of evidence from natural experiments. *Economics of Education Review*, *66*, 206–222. https://doi.org/10.1016/J.ECONEDUREV.2018.08.001

Washington, V., & Reed, M. (2008). A study of the Massachusetts child care voucher system: Impact on children, families, providers, and resource and referral agencies. *Families in Society*, *89*(2), 202–207. https://doi.org/10.1606/1044-3894.3735

Workman, S. (2018). Where does your child care dollar go? In *Child Development Perspectives* (Vol. 12, Issue 1). Blackwell Publishing. https://doi.org/10.1111/CDEP.12260/FULL

Workman, S. (2021). *The true cost of high-quality child care across the United States*. https://www.americanprogress.org/article/true-cost-high-quality-child-care-across-united-states/

Women's Bureau, U.S. Department of Labor and American Community Survey, U.S. Census Bureau. (2023). *National Database of Childcare Prices 2018.*

Tables and Figures

Table 1.

Descriptive Statistics for CCDF Center-Based and Home-Based Providers of 2012 and 2019

	2012	2019	Difference
Center-Based Providers			
Provider Characteristics: Supply Measures			
Total number of children cared for	69.6	77	*
	-2.26	-2.81	
Percent of children funded by CCDF	0.32	0.29	*n.s.*
	-0.02	-0.01	
Serves infants/toddlers	0.81	0.84	*n.s.*
Serves preschoolers	0.93	0.96	*
Goals of Reauthorization			
Open for non-standard hours	0.13	0.12	*n.s.*
Average child to staff ratio (in all age groups)	6.09	6.38	*n.s.*
	-0.15	-0.47	
Program has an overall quality rating (QRIS)	0.53	0.62	*
Provider Characteristics: Funding Sources			
Program receives revenue from: State or local government	0.95	1	*n.s.*
Program receives revenues from: Federal government	0.49	0.37	**
Public pre-k provider	0.3	0.16	***
Head Start provider	0.1	0.3	***
Provider Characteristics: Director's Qualities			
Director has B.A.	0.6	0.62	*n.s.*
Years of experience working with children under age 13	11.1	11.5	**
	-0.13	-0.12	
Observations	1880	2200	
Home-Based Providers			
Provider Characteristics: Supply Measures			
Average number of children cared for weekly	8.18	6.12	**
	-0.35	-0.56	
Number of regularly cared for infants/toddlers	2.53	1.99	*n.s.*
	-0.22	-0.36	
Number of regularly cared for preschoolers	2.34	1.69	*
	-0.2	-0.25	
Goals of Reauthorization			
Care is provided during non-standard hours	0.52	0.49	*n.s.*
Uses a curriculum or prepared set of learning/play activities	0.39	0.23	*
Provider Characteristics: Director's Qualities			
Provider has B.A.	0.23	0.16	*n.s.*
If provider has more than 15 years of experience	0.34	0.29	*n.s.*
Observations	2400	2520	

Note. Descriptives excludes home-based providers who are both relationship-based and unpaid. All estimates are weighted and restricted to non-missing data. "*n.s.*" indicates that the difference is not significant. N's are rounded to the nearest 20,

and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Standard error in parentheses. Non-standard hours include evenings, overnight, and weekend. B.A. is bachelor's degree. QRIS is the Quality Rating and Improvement System.

Table 2.

Estimated impact of states that reached the 75th percentile of market rates on center-based provider outcomes

	Supply Measures				Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Serves preschoolers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	8.25*	0.30***	0.42***	0.01	0.08***	-0.30	0.02
	(3.68)	(0.01)	(0.02)	(0.01)	(0.02)	(0.53)	(0.03)
Treated State	-27.1*	0.02	-0.12	-0.06	0.16*	-0.90	-0.38***
	(11.5)	(0.03)	(0.11)	(0.05)	(0.07)	(0.89)	(0.10)
DDD (CCDF*Treated State*Post)	14.7	-0.10**	0.06	0.06+	-0.22*	0.12	0.28**
	(15.9)	(0.03)	(0.09)	(0.03)	(0.09)	(0.91)	(0.09)
Observations	7960	7960	7960	7960	7960	7960	7960

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates for the toddler/preschooler age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Table 3.

Estimated impact of states that reached the 75th percentile of market rates on home-based provider outcomes

	Supply Measures			Goals of Reauthorization	
	(1)	(2)	(3)	(4)	(5)
	Average number of children cared for weekly	Number of regularly cared for infants/toddlers	Number of regularly cared for preschoolers	Care is provided during nonstandard hours	Uses a curriculum or prepared set of learning/play activities
CCDF	1.81***	0.42	0.14	0.01	0.03
	(0.42)	(0.28)	(0.23)	(0.07)	(0.06)
Treated State	-4.55	0.15	-0.42	-0.76***	0.13
	(4.54)	(0.96)	(0.73)	(0.22)	(0.28)
DDD (CCDF*Treated State*Post)	0.79	-0.82	1.37***	0.49+	0.09
	(1.47)	(0.75)	(0.40)	(0.28)	(0.13)
Observations	5600	5600	5600	5600	5600

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. Analyses excludes providers who are both relationship-based and unpaid. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each column represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Provider covariates include the provider's years of experience and if provider has a bachelor's degree. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Table 4.

Subgroup analysis: Estimated impact of states that reached the 75th percentile of market rates on center-based provider outcomes in areas with high poverty

	Supply Measures				Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Serves preschoolers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	-6.18	0.45***	0.43***	-0.01	0.06*	-0.91**	0.06
	(6.71)	(0.02)	(0.03)	(0.01)	(0.03)	(0.28)	(0.05)
Treated State	-26.0+	0.09	-0.23	-0.07	0.23**	0.83	-0.28
	(15.0)	(0.06)	(0.16)	(0.04)	(0.07)	(1.04)	(0.19)
DDD (CCDF*Treated State*Post)	32.6*	-0.09	0.23	0.02	-0.18**	-2.04*	-0.02
	(14.9)	(0.12)	(0.17)	(0.03)	(0.06)	(0.85)	(0.22)
Observations	2590	2590	2590	2590	2590	2590	2590

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates and is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + p<0.10. * p<0.05. ** p<0.01. *** p<0.001.

Table 5.

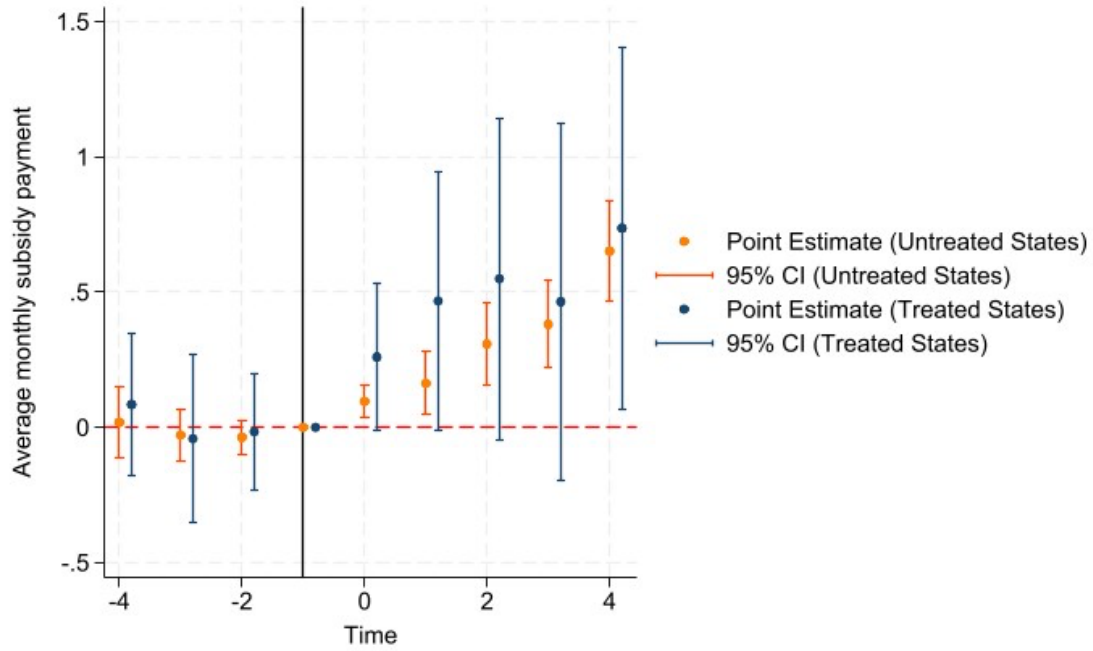
Subgroup analysis: Estimated impact of states that reached the 75th percentile of market rates on home-based provider outcomes in areas with high poverty

	Supply Measures			Goals of Reauthorization	
	(1)	(2)	(3)	(4)	(5)
	Average number of children cared for weekly	Number of regularly cared for infants/toddlers	Number of regularly cared for preschoolers	Care is provided during nonstandard hours	Uses a curriculum or prepared set of learning/play activities
CCDF	2.14*	0.89***	0.33	-0.04	0.14**
	(0.88)	(0.26)	(0.44)	(0.09)	(0.05)
Treated State	-12.5*	-3.34**	-1.04	0.14	0.53*
	(5.24)	(1.14)	(1.23)	(0.29)	(0.21)
DDD (CCDF*Treated State*Post)	-3.78	0.61	-1.27	0.08	-0.32**
	(2.49)	(0.39)	(1.02)	(0.19)	(0.12)
Observations	1440	1440	1440	1440	1440

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates for all age groups. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. Analyses excludes providers who are both relationship-based and unpaid. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each column represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates and is restricted to non-missing data. Provider covariates include the provider's years of experience, if provider has a bachelor's degree, and provider's self-rated health. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Figure 1.

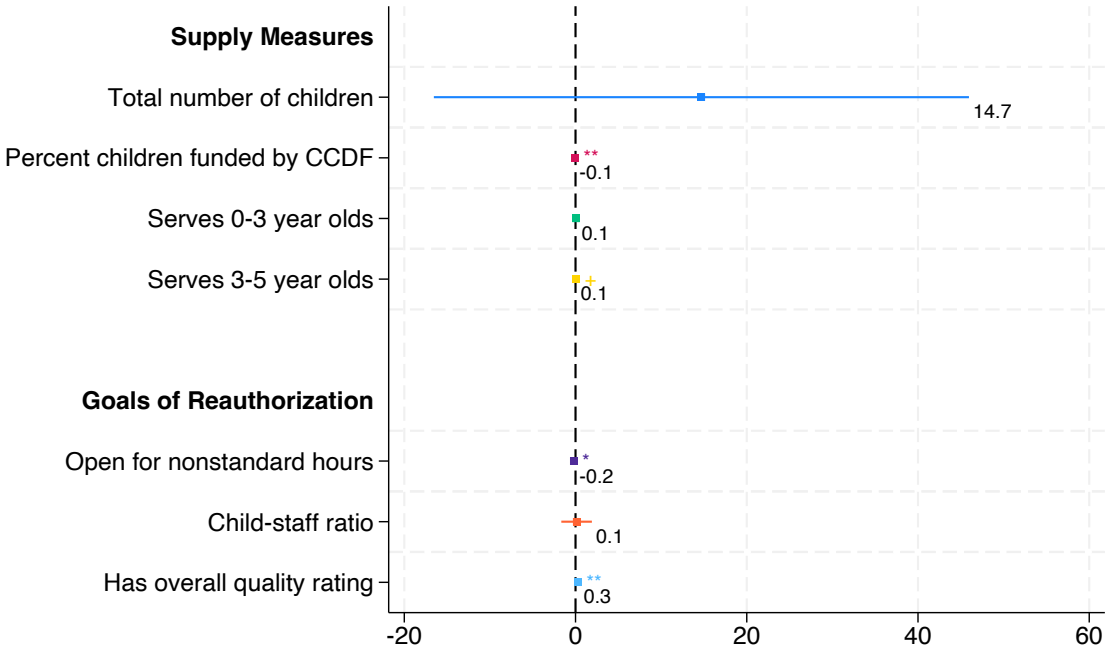
Event study of subsidy payment change from 2011-2019 for treated and untreated states



Note. Time 0 is centered on 2015 at the implementation year of the 2014 CCDBG reauthorization. Standard errors are clustered at the state level. State fixed effects are included. Payment amounts are adjusted to real 2019 dollars and are scaled to every $100. Untreated states are states that are <75th percentile for center-based, toddler and preschooler provider. Treated states are states that are ≥ 75th percentile of market rates.

Figure 2.

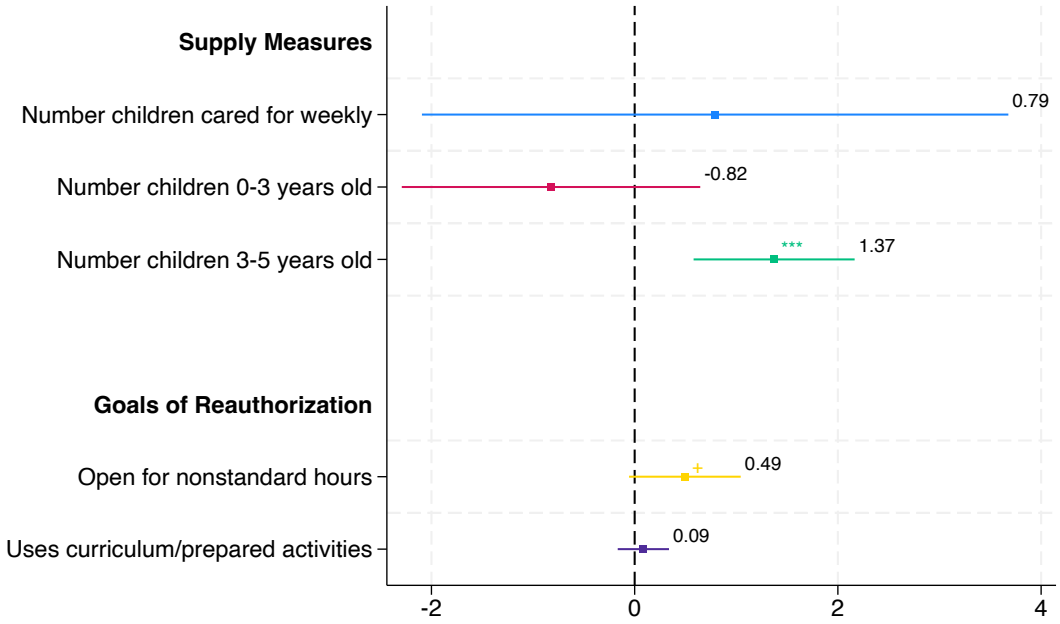
Estimated DDD impact of states that reached the 75th percentile of market rates on center-based provider outcomes



Note. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to a maximum of three significant digits per confidentiality agreement with NORC. Models are weighted using NSECE sampling weights. All coefficients include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$.

Figure 3.

Estimated DDD impact of states that reached the 75th percentile of market rates on home-based provider outcomes



Note. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. Analyses excludes providers who are both relationship-based and unpaid. N's are rounded to the nearest 20, and all coefficients are rounded to a maximum of three significant digits per confidentiality agreement with NORC. Models are weighted using NSECE sampling weights. All coefficients include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Provider covariates include the provider's years of experience and if provider has a bachelor's degree. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. *** $p<0.001$.

Appendix

Appendix Table 1.

Summary of data sources and variables

Data Source	Year	Variables
CCDF state plans *(Center- and Home-based providers)*	2012-2019	**CCDF Policy Predictors:** If state reached the 75th percentile of reimbursement rates compared to market rates
NSECE *(Center- and Home-based providers)*	2012 & 2019	**Center-based Provider Outcomes:** *Supply* Total number of children cared for Percent children funded by CCDF Serves infants and toddlers (0-3 year olds) Serves preschoolers (3-5 year olds) *Goals of Reauthorization* Open for nonstandard hours of care Average child-staff ratio Has overall quality rating (QRIS) **Home-based Provider Outcomes:** *Supply* Average number of children cared for weekly Number of regularly cared for infants and toddlers (0-3 year olds) Number of regularly cared for preschoolers (3-5 year olds) *Goals of Reauthorization* Care is provided during nonstandard hours Uses a curriculum or prepared set of learning/play activities
NSECE *(Center- and Home-based providers)*	2012	**Center-based Provider Covariates:** Director's total years of experience w/ young children Whether director has a bachelor's degree If any children are funded by Head Start Receives revenue from state or local government Receives revenue from federal government If center is public prekindergarten provider **Home-based Provider Covariates:** Provider's years of experience Whether provider has a bachelor's degree
National Welfare Data	2012	**State-level Covariates:** Ratio of Gross State Product Ratio of Temporary Assistance for Needy Families Fraction of State Senate Democrat Poverty rate Unemployment rate
National Database of Childcare Prices	2012	**State-level Covariates:** Percent population Hispanic/Latinx Percent population white/Caucasian
CCDF Administrative Data/ ACF 801	2011-2018	**Parallel Trends test:** Total payment amount to CCDF provider

Note. CCDF is the Child Care and Development Fund. NSECE is the National Survey of Early Care and Education. CCDF state plans were collected through publicly available documents on state agency websites or obtained by contacting CCDF state agencies. Not all data are available for both center and home-based providers. State-submitted CCDF plans and NSECE have data for both types of providers. Data from the CCDF Policies Database only include information for centers due to high missingness for home-based providers.

Appendix Table 2.

Reimbursement Rate as a Percentile of Market Rate for Center-Based Providers (2016-2018)

State Abbreviation	Infants	Toddlers	Preschooler
AL	46	46	44
AK	11	21	11
AZ	8	5	5
AR	80	87	83
CA	55-60	55-60	55-60
CO	10-25	10-25	10-25
CT	4	4	6
DE	75	75	75
DC	N/A	N/A	N/A
FL	25	27	27
GA	50	50	50
HI	56	56	21
ID	40	30	30
IL	30.5	30.5	28
IN	32	26	31
IA	40	40	25
KS	15	15	37
KY	33	40	25
LA	50	50	50
ME	60	60	60
MD	8	8	8
MA	58	53	35
MI	N/A	N/A	N/A
MN	25.5	26.9	23.7
MS	54	54	55
MO	46	46	38
MT	75	75	75
NE	60	60	60
NV	8.3	5.17	3.01

NH	50	50	50
NJ	19	35	7
NM	74	50	31
NY	69	69	69
NC	56	56	56
ND	60	60	60
OH	16	16	16
OK	35.67	39.86	39.4
OR	75	75	75
PA	22.2	31.1	18.3
RI	12	21	18
SC	75	75	75
SD	80	80	90
TN	21	14-20	19
TX	54	43	26
UT	69	69	68
VT	1.08	1.08	4.14
VA	18	24	32
WA	11	6	8
WV	75	75	75
WI	53	53	49
WY	15	24	23

Note. N/A is not applicable. We did not obtain 2016-2018 CCDF plans for MI, and D.C. did not list reimbursement rate percentiles on their CCDF plans. States that reached the 75th percentile for infant groups include 8 states: AR, DE, MT, NM, OR, SC, SD, WV. For toddlers, 7 states were treated (AR, DE, MT, OR, SC, SD, WV). For preschoolers, the same 7 states were treated as the toddler group. 23 states reached the 50th percentile or higher for infant groups (AR, CA, DE, GA, HI, LA, ME, MA, MS, MT, NE, NH, NC, ND, NY, NM, OR, SC, SD, TX, WV, UT, WI). For toddlers, 22 states were treated (AR, CA, DE, GA, HI, LA, ME, MA, MS, MT, NE, NH, NC, ND, NM, OR, SC, SD, WV, NY, UT, WI). For preschoolers, 18 states were treated (AR, CA, DE, GA, LA, ME, MS, MT, NE, NH, NC, ND, OR, SC, SD, WV, NY, UT).

Appendix Table 3.

Reimbursement Rate as a Percentile of Market Rate for Home-Based Providers (2016-2018)

State Abbreviation	Infants	Toddlers	Preschooler
AL	22	46	17
AK	45	45	28
AZ	70	64	54
AR	98	98	97
CA	50-55	50-55	55-60
CO	<10	<10	<10
CT	72	72	21
DE	75	N/A	75
DC	N/A	N/A	N/A
FL	13	17	25
GA	50	50	50
HI	42	42	25
ID	40	35	40
IL	71.5	71.5	56.9
IN	47	58	45
IA	60	25	40
KS	50	50	55
KY	39	25	29
LA	25	25	25
ME	60	60	60
MD	15	8	3
MA	33	41	36
MI	N/A	N/A	N/A
MN	39	42.3	31.9
MS	52	52	53
MO	49	49	43
MT	75	75	75
NE	60	60	60
NV	17.65	9.65	13.93
NH	50	50	50

NJ	58	74	50
NM	47	15	22
NY	69	69	69
NC	58	59	58
ND	60	60	60
OH	16	16	16
OK	51.9	51.9	52.15
OR	75	75	75
PA	17.2	20.2	20.9
RI	55	56	54
SC	75	75	75
SD	75	75	75
TN	7-22, 26-33	9-21,16-25	12-18,10-14
TX	39	44	14
UT	71	71	72
VT	3.03	3.03	3.01
VA	35	33	38
WA	72	61	33.2
WV	75	75	75
WI	53	50	49
WY	11	14	18

Note. N/A is not applicable. We did not obtain 2016-2018 CCDF plans for MI, and D.C. did not list reimbursement rate percentiles on their CCDF plans. The same 7 states set reimbursements to the 75th percentile for infants, toddlers, and preschoolers (AR, DE, MT, OR, SC, SD, WV). 27 states reached the 50th percentile for for infants (AZ, AR, CA, CT, DE, GA, IL, IA, KS, ME, MS, MT, NE, NH, NJ, NY, NC, ND, OK, RI, OR, SC, SD, UT, WA, WV, WI). For toddlers, 27 states were treated (AZ, AR, CA, CT, DE, GA, IL, IN, KS, ME, MS, MT, NE, NH, NJ, NY, NC, ND, OK, RI, OR, SC, SD, UT, WA, WV, WI). 23 states were treated for the preschooler group (AZ, AR, CA, DE, GA, IL, KS, ME, MS, MT, NE, NH, NJ, NY, NC, ND, OK, RI, OR, SC, SD, UT, WV).

Appendix Table 4.

Balance Test for Center and State-level Covariates

	Non-treated States		Treated States		Difference
	(1)	(2)	(3)	(4)	(3)-(1)
	2012	2019	2012	2019	
Provider Characteristics: Funding Sources					
Program receives revenue from: State or local government	0.94	1.00	0.98	1.00	0.04
Program receives revenues from: Federal government	0.48	0.38	0.65	0.23	0.17
Public pre-k provider	0.30	0.16	0.19	0.21	-0.11
Head Start provider	0.10	0.31	0.03	0.22	-0.08**
Provider Characteristics: Director's Qualities					
Director has B.A.	0.60	0.61	0.51	0.71	-0.09
Years of experience working with children under age 13	11.1	11.5	10.6	11.6	-0.48*
	(0.14)	(0.13)	(0.17)	(0.21)	
State Characteristics					
GSP per capita	0.05	0.06	0.04	0.05	-0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	
Ratio of TANF	0.01	0.01	0.01	0.01	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	
Fraction of State Senate that is Democrat	0.45	0.45	0.54	0.44	0.08***
	(0.01)	(0.01)	(0.02)	(0.03)	
Poverty Rate	15.2	10.4	16.5	12.0	1.25*
	(0.19)	(0.18)	(0.59)	(0.57)	
Unemployment rate	8.05	3.66	7.72	3.76	-0.33
	(0.09)	(0.04)	(0.20)	(0.13)	
Percent Hispanic/Latinx	9.26	11.8	6.04	12.4	-3.22***
	(0.50)	(0.59)	(0.48)	(3.37)	
Percent white/Caucasian	82.1	82.4	77.8	79.1	-4.26
	(0.73)	(0.71)	(2.30)	(1.84)	
Observations	1740	2040	100	120	

Note. All estimates are weighted and restricted to non-missing data. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Standard error in parentheses. Treated states are states that reached the 75th percentile for infant group for center-based providers. GSP is the gross state product. TANF is the Temporary Assistance for Needy Families. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table 5.

Balance Test for Home-based Providers and State-level Covariates

	Non-treated States		Treated States		Difference
	(1)	(2)	(3)	(4)	(3)-(1)
	2012	2019	2012	2019	
Provider Characteristics: Director's Qualities					
Provider has B.A.	0.24	0.18	0.18	0.06	-0.06
Provider has more than 15 years of experience	0.35	0.34	0.37	0.06	0.02
State Characteristics					
GSP per capita	0.05	0.07	0.04	0.06	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	
Ratio of TANF	0.01	0.01	0.01	0.02	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	
Fraction of State Senate that is Democrat	0.45	0.48	0.46	0.56	0.01
	(0.01)	(0.03)	(0.05)	(0.02)	
Poverty Rate	14.5	10.1	15.5	9.02	0.97
	(0.36)	(0.31)	(0.64)	(0.54)	
Unemployment rate	7.89	3.62	7.64	3.75	-0.25
	(0.16)	(0.08)	(0.58)	(0.08)	
Percent Hispanic/Latinx	9.24	12.9	4.24	10.5	-5.00***
	(0.78)	(1.91)	(0.85)	(0.91)	
Percent white/Caucasian	85.3	83.2	77.1	87.8	-8.16
	(0.89)	(1.53)	(5.27)	(1.04)	
Observations	2180	2320	160	100	

Note. Descriptives excludes providers who are both relationship-based and unpaid. All estimates are weighted and restricted to non-missing data. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Standard error in parentheses. Treated states are states that reached the 75th percentile for infant group for home-based providers. GSP is the gross state product. B.A. is bachelor's degree. TANF is the Temporary Assistance for Needy Families. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table 6.

Estimated impact of states that reached the 75th percentile of market rates on center-based provider outcomes

	Supply Measures			Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	8.40*	0.30***	0.42***	0.08***	-0.30	0.02
	(3.69)	(0.01)	(0.02)	(0.02)	(0.53)	(0.03)
Treated State	-21.0+	0.02	-0.11	0.14*	-1.13	-0.33***
	(11.1)	(0.03)	(0.10)	(0.06)	(0.83)	(0.10)
DDD (CCDF*Treated State*Post)	6.18	-0.07*	0.09	-0.20*	0.06	0.23**
	(15.0)	(0.03)	(0.08)	(0.08)	(0.84)	(0.08)
Observations	7960	7960	7960	7960	7960	7960

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates for the infant age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table 7.

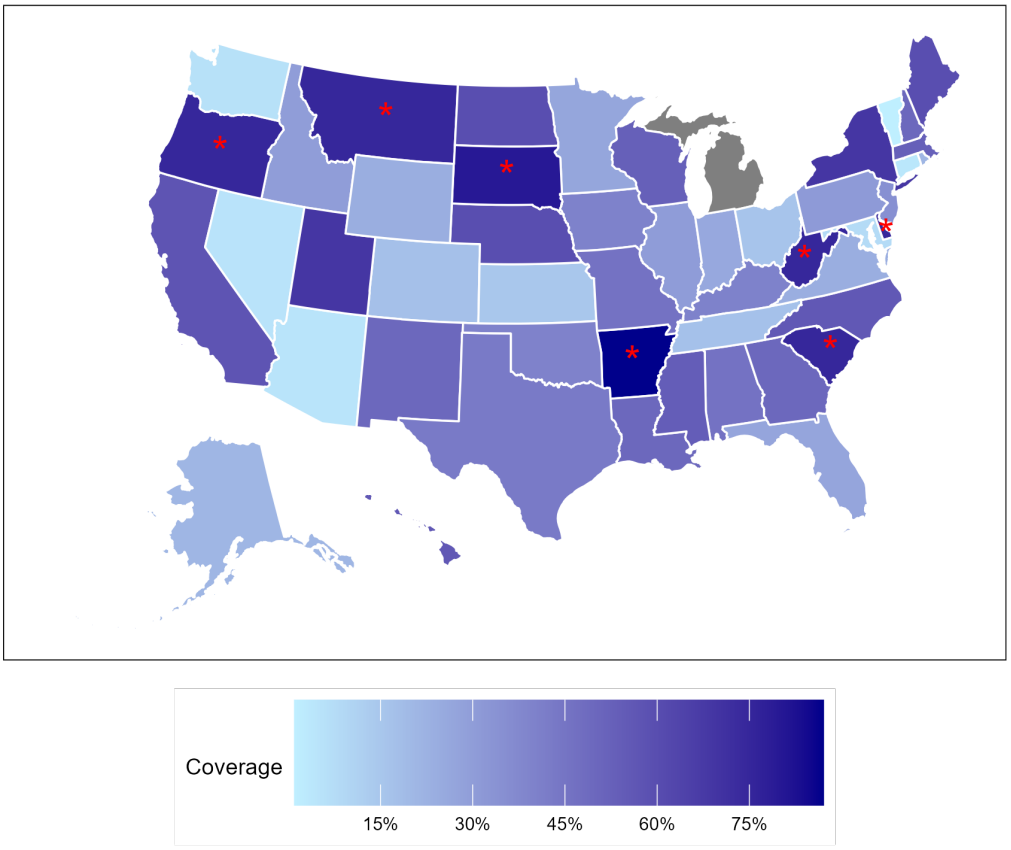
Subgroup analysis: Estimated impact of states that reached the 75th percentile of market rates on center-based provider outcomes in areas with high poverty

	Supply Measures			Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	-5.50	0.45***	0.42***	0.06*	-0.87**	0.06
	(6.80)	(0.02)	(0.03)	(0.03)	(0.29)	(0.05)
Treated State	-10.8	0.09+	-0.14	0.15*	-0.67	-0.26
	(16.5)	(0.05)	(0.12)	(0.07)	(1.04)	(0.16)
DDD (CCDF*Treated State*Post)	-0.38	-0.07	0.25*	-0.15**	-1.54*	-0.04
	(21.5)	(0.07)	(0.10)	(0.05)	(0.73)	(0.12)
Observations	2590	2590	2590	2590	2590	2590

Note. Treated states represent states who reached the 75th percentile of market reimbursement rates. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates and is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Figure 1.

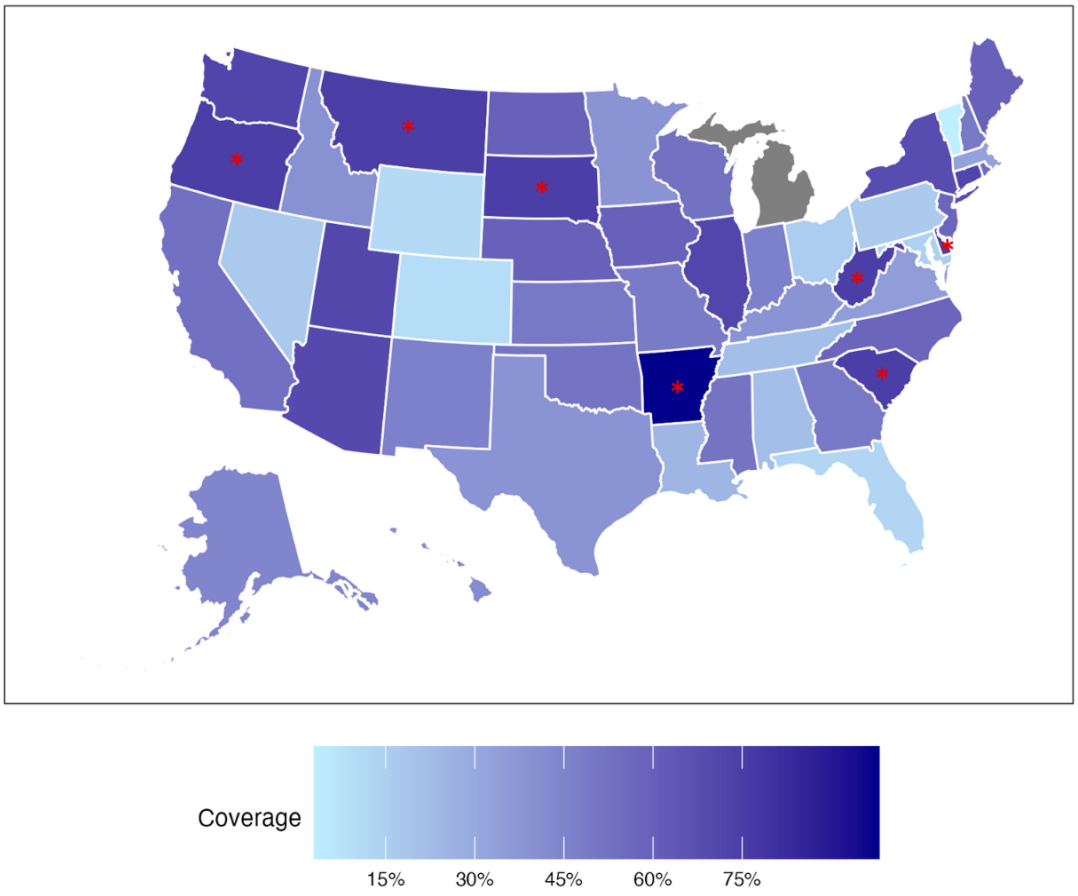
US map of reimbursement rate percentile of market rates for center-based providers



Note. We did not obtain 2016-2018 CCDF plans for MI, and D.C. did not list reimbursement rate percentiles on their CCDF plans. States that reached the 75th percentile for toddlers include 7 states: AR, DE, MT, OR, SC, SD, WV. Red stars indicate treated states. For preschoolers, the same 7 states were treated as the toddler group.

Appendix Figure 2.

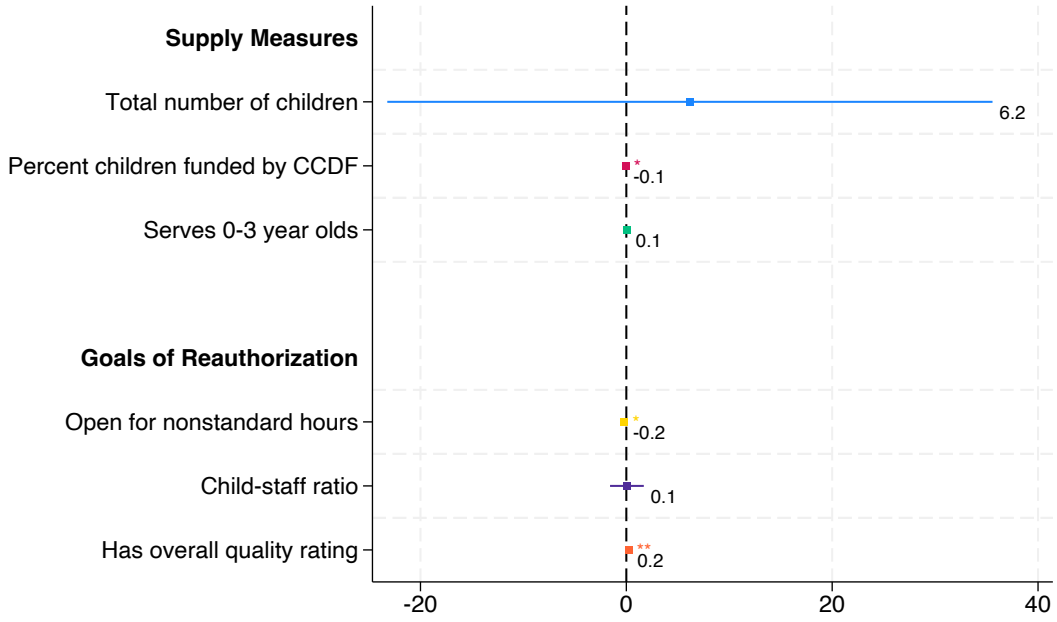
US map of reimbursement rate percentile of market rates for home-based providers



Note. We did not obtain 2016-2018 CCDF plans for MI, and D.C. did not list reimbursement rate percentiles on their CCDF plans. The same 7 states set reimbursements to the 75th percentile for infants, toddlers, and preschoolers: AR, DE, MT, OR, SC, SD, WV. Red stars indicate treated states.

Appendix Figure 3.

Estimated DDD impact of states that reached the 75th percentile of market rates on center-based provider outcomes



Note. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to a maximum of three significant digits per confidentiality agreement with NORC. Models are weighted using NSECE sampling weights. All coefficients include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. * $p<0.05$. ** $p<0.01$.

Appendix A: Collection of the National Survey of Early Care and Education

In both waves of data, 219 primary sampling units (PSUs) were chosen across all states, proportionate to the number of children under age 18. Within the PSUs, secondary sampling units of providers were selected from an administrative list of centers in each state using clusters around a census tract. Provider data were collected through surveys of directors to capture a wide range of descriptive information including the characteristics of the director, enrolled children and center staff, financial information, and participation in accreditation and professional development practices. Data were collected for the 2012 wave from October 2011 through June 2012, and between January and July 2019 for the 2019 wave. Sampling weights provided by the NSECE team are used to obtain nationally representative samples.

Appendix B: No anticipation assumption

We test the no anticipation assumption by examining collected state CCDF plans for treated states to observe whether states increased their reimbursement rate prior to the reauthorization legislation. For each treated state and each age group, we confirmed that the state was treated after the reauthorization year by coding information backwards by year on the reimbursement rate percentile. We started with 2016-2018 fiscal year CCDF plans, the plan closest to our outcome year (2019), to determine if states were treated, then verified with 2014-2015 plans to determine if states were treated prior to 2016. Under no anticipation, we would expect states to only reach the 75th percentile 2014 or later, but not before. We find that no states that reached the 75th percentile in 2016-2018 were treated in 2014-2015 for high rate areas, populated areas, thereby finding no evidence of the no anticipation assumption.

Appendix C: Robustness Check

To ascertain the robustness and reliability of our findings, we tested the impact of the 2014 CCDBG reauthorization legislation using same the triple differences specification but examining reimbursements as a continuous predictor using a separate data source. Specifically, we investigate the impact of a $100 increase in reimbursement rates on center-based provider outcomes.

For our analyses, we use the CCDF Policies Database to track state-level policies governing center-based providers. The database, funded by the Office of Planning, Research, and Evaluation, details specific policy changes across states and years for the CCDF program (Minton, et al., 2020). The database spans 32 categories in more than 500 policy dimensions (e.g., professional development requirements, quality monitoring, subsidy reimbursement rates) capturing when policies go into effect. Data were coded based on states' caseworker manuals and child care regulations. We include the continuous, monthly, full-time base reimbursement rates for center providers for the two youngest age groups. The first age group encompasses infants to preschoolers and has a maximum age limit of 17-78 months. The second reimbursement rate category includes infants to children in middle childhood with maximum age limits of 17-143 months.[12] We focus on the youngest two age groups because a) centers serving these age groups are more likely to accept subsidies and changes in rates from these age groups would likely have the largest impact on providers, if any, and b) the 2014 reauthorization specifically targeted improvements for infants and toddlers. Home-based provider information was not included due to the extremely high missingness of information; thus, our analyses using

[12] We include reimbursement rates using the infant-toddler and infant-middle childhood age groups due to the nature of the CCDF Policies Database data. The data precludes us from focusing on one specific age group but rather an age range because of states vary widely in their child age requirements.

the CCDF Policies Database only include center-based providers. Reimbursement rates are scaled in $100's and presented in real 2019 dollars. In 2012, reimbursement rates were $898 and $766 monthly, respective to age groups. In 2019, rates were $1,037 and $871, respectively. We observe about a 15% increase in reimbursement rates from 2012 to 2019 across both age groups.

Results

Infant to Preschool

We present our first set of estimates in Appendix Table C1 Panel A using an alternative data source to answer: to what extent did reimbursement rates as a result of the reauthorization change the supply and quality of child care providers? In our first set of results, our predictor is the reimbursement rate for infants to preschoolers (maximum age of 17-78 months). We find that reimbursement rates have increased by approximately 15% from 2012 to 2019, or $139 per subsidized child.

[Appendix Table C1]

Our most controlled models with the triple differences estimator (Panel A) indicate that relative to other centers within the same state in the post-period, $100 increases to reimbursement rates generally had no or small significant impacts on the outcomes of interest. However, we do find that a $100 increase in the reimbursement rate for infants to toddlers significantly decreased centers' acceptance of children funded by subsidies by .01 percent. Results also show that increases in rates significantly decreased centers' offer of serving infants/toddlers by 1 pp.

Infant to Middle Childhood

Our second set of estimates includes reimbursement rates for infants to middle childhood (children with a maximum age of 17-143 months). The reimbursement rate increased by approximately 14%, or $105 per subsidized child.

Results shown in Appendix Table C1 Panel B display a similar pattern to Panel A, with generally no significant impact on the supply measures or measures related to the reauthorization legislation. Our DDD model shows that compared to other centers in the same state, post-authorization, a $100 increase in the reimbursement rate decreased centers' acceptance of children funded by subsidies by .01 percent.

Our robustness check indicates that we find a relatively similar magnitude of results compared to our main analyses, where increasing reimbursement rates reduces the percentage of subsidized slots in center-based providers. However, our robustness check did not detect any significant differences in whether centers are more open for nonstandard hours of care and whether a program has a QRIS.

Appendix D: Sensitivity check for the 50th percentile of market rates

To test the sensitivity of our main analyses, we analyze the impact of states that have reached the 50th percentile of market rates compared to states that have not reached the 50th percentile. While the 75th percentile (our main analyses) is a pertinent policy question directly related to the 2014 CCDBG reauthorization, we test if our results are sensitive to the percentile specification for both center and home-based providers and each age group.

We compare these results to states that reached the 50th percentile of market rates or higher as a sensitivity test and to highlight differences and changes for states that have higher reimbursement rates compared to states with lower (50th percentile) rates. Twenty-three states reached the 50th percentile or higher for center-based, infant groups. For toddlers, 22 states were treated, and for preschoolers, 18 states were treated.

Twenty-seven states reached the 50th percentile for home-based providers for infants. For toddlers, 27 states were treated. Lastly, 23 states reached the 50th percentile for the preschooler group. While the treated states differ slightly for home-based providers, the results are strikingly similar in direction and magnitude across all three age groups. For brevity and ease of interpretation, we present only the results for preschoolers.

Results

Center-Based Providers

Appendix Table D1, D2, and D3 details results for the impact of reaching the 50th percentile of market rates on center-based outcomes. Each table corresponds to the infant, toddler, and preschooler age group, respectively.

[Appendix Table D1]

[Appendix Table D2]

[Appendix Table D3]

Centers in states that reached the 50th percentile post-reauthorization, compared to centers in nontreated states, served .05 percent fewer children funded by CCDF. At the 75th percentile, centers served even fewer CCDF children, .07 percent. This difference ranges from .02-.05 percent depending on the age group, though centers in states at the 75th percentile consistently serve fewer children funded by CCDF. Centers post-reauthorization in states at the 75th percentile are 20-22 pp less likely to offer nonstandard hours. Compared to the 50th percentile, providers are only 3-7pp less likely to offer nonstandard hours. Centers in states at the 50th percentile are also significantly less likely to serve infants/toddlers (7-11 pp change depending on the age group), whereas the opposite pattern exists at the 75th percentile where centers are 6-9 pp more likely to serve this age group, though this is not statistically significant for any age group. Overall, centers at the 75th percentile show greater negative changes on their child care supply for subsidized slots and services, compared to centers at the 50th percentile. However, we do observe some positive changes. At the 50th percentile, centers are also almost half as less likely to participate in QRIS compared to the 75th percentile. These differences suggest that at the highest reimbursement rates (75th percentile), centers post-reauthorization serve *fewer* children funded by CCDF and are *less* likely to be open for nonstandard hours of care but are *more* likely to have a QRIS.

Home-Based Providers

Appendix Table D4 displays DDD results for home-based providers in states that had met or exceeded the 50th percentile of market rates in the post-reauthorization period. Since findings across all three age groups look very similar, we include the set of preschool age group analyses only.

Compared to the 75th percentile, we find that almost all outcomes trended in the same direction but a smaller magnitude, except for whether providers used a curriculum (column 5). In states treated at the 75th percentile, providers were 9 pp more likely to use a curriculum, though this was not statistically significant. At the 50th percentile however, providers in treated states, compared to providers in non-treated states post-reauthorization, were 22 pp significantly less likely to use a curriculum. The remaining outcomes generally show a smaller magnitude, such as providers in states at the 50th percentile caring for only 1.23 more preschoolers (compared to 1.37 at the 75th percentile), and 38 pp more likely to provide nonstandard care hours (compared to 49 pp at the 75th percentile). These differences between the 75th and 50th percentile suggest that as rates decrease, home-based providers decrease their supply of care and services and are less likely to meet the goals of the reauthorization. Encouragingly, this suggests that as reimbursement rates increase, home-based providers are able to respond positively and increase their capacity and services, a different pattern than results for center providers.

[Appendix Table D4]

Appendix Table C1.

Estimated impact of reimbursement rate increases ($100) on center-based provider outcomes

	Supply Measures				Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Serves preschoolers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
Panel A. Infants to Toddlers							
CCDF	-1.99	0.43***	0.51***	0.06+	0.09*	-1.75	0.06
	(9.66)	(0.03)	(0.05)	(0.04)	(0.04)	(1.82)	(0.06)
Reimbursement Rate (in 00's)	-1.15	0.01	-0.01	0.01	0.01+	0.05	0.00
	(1.87)	(0.01)	(0.01)	(0.01)	(0.01)	(0.17)	(0.02)
DDD (CCDF*Reimbursement*Post)	1.14	-0.01***	-0.01*	-0.01	-0.00	0.15	-0.00
	(1.08)	(0.00)	(0.01)	(0.00)	(0.00)	(0.24)	(0.01)
Panel B. Infants to Middle Childhood							
CCDF	1.00	0.42***	0.49***	0.07+	0.10*	-3.03	0.01
	(10.7)	(0.03)	(0.06)	(0.04)	(0.04)	(2.80)	(0.06)
Reimbursement Rate (in 00's)	1.21	0.00	-0.00	0.01	0.02*	0.24	-0.01
	(1.64)	(0.01)	(0.01)	(0.01)	(0.01)	(0.21)	(0.02)
DDD (CCDF*Reimbursement*Post)	0.96	-0.01***	-0.01	-0.01	-0.00	0.34	0.00
	(1.41)	(0.00)	(0.01)	(0.01)	(0.00)	(0.41)	(0.01)
Observations	8100	8100	8100	8100	8100	8100	8100

Note. Reimbursement rates are in real 2019 dollars and scaled to every $100. Iowa is excluded due to missing reimbursement rates. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each column represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Analyses is restricted to non-missing data. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include

the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table D1.

Estimated impact of states that reached the 50th percentile of market rates on center-based provider outcomes

	Supply Measures			Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	10.3**	0.31***	0.44***	0.08***	-0.37	-0.00
	(3.66)	(0.01)	(0.03)	(0.02)	(0.67)	(0.03)
Treated State	10.4	0.00	0.10+	0.01	-0.87	-0.19***
	(8.41)	(0.02)	(0.05)	(0.03)	(0.55)	(0.05)
DDD (CCDF*Treated State*Post)	-8.03	-0.05**	-0.09*	-0.03	0.29	0.14***
	(7.80)	(0.02)	(0.04)	(0.03)	(0.87)	(0.04)
Observations	7960	7960	7960	7960	7960	7960

Note. Treated states represent states who reached the 50th percentile of market reimbursement rates for the infant age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table D2.

Estimated impact of states that reached the 50th percentile of market rates on center-based provider outcomes

	Supply Measures				Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Serves preschoolers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	9.08*	0.31***	0.43***	0.01	0.08***	-0.35	0.00
	(3.71)	(0.01)	(0.03)	(0.02)	(0.02)	(0.64)	(0.03)
Treated State	3.53	0.01	0.07	-0.03	0.04	-0.87	-0.14**
	(8.80)	(0.02)	(0.06)	(0.03)	(0.03)	(0.60)	(0.05)
DDD (CCDF*Treated State*Post)	-2.90	-0.05**	-0.07	0.01	-0.05	0.23	0.12**
	(8.17)	(0.02)	(0.05)	(0.02)	(0.04)	(0.83)	(0.04)
Observations	7960	7960	7960	7960	7960	7960	7960

Note. Treated states represent states who reached the 50th percentile of market reimbursement rates for the toddler age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table D3.

Estimated impact of states that reached the 50th percentile of market rates on center-based provider outcomes

	Supply Measures				Goals of Reauthorization		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total number of children cared for	Percent of children funded by CCDF	Serves infants/toddlers	Serves preschoolers	Open for nonstandard hours	Average child to staff ratio (in all age groups)	Program has an overall quality rating (QRIS)
CCDF	8.00*	0.31***	0.44***	0.01	0.08***	-0.34	0.00
	(3.87)	(0.01)	(0.03)	(0.01)	(0.02)	(0.61)	(0.03)
Treated State	-5.48	0.01	0.05	-0.05+	0.03	-0.38	-0.15**
	(8.06)	(0.02)	(0.06)	(0.03)	(0.03)	(0.63)	(0.05)
DDD (CCDF*Treated State*Post)	3.62	-0.05*	-0.11*	0.00	-0.07*	0.25	0.16***
	(7.31)	(0.02)	(0.05)	(0.02)	(0.03)	(0.81)	(0.04)
Observations	7960	7960	7960	7960	7960	7960	7960

Note. Treated states represent states who reached the 50th percentile of market reimbursement rates for the preschool age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each outcome represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Center covariates include the director's years of experience, if director has a bachelor's degree, if any children are funded by Head Start, if center gets state or local revenue, if center gets federal revenue, and if center is a public pre-k provider. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.

Appendix Table D4.

Estimated impact of states that reached the 50th percentile of market rates on home-based provider outcomes

	Supply Measures			Goals of Reauthorization	
	(1)	(2)	(3)	(4)	(5)
	Average number of children cared for weekly	Number of regularly cared for infants/toddlers	Number of regularly cared for preschoolers	Care is provided during nonstandard hours	Uses a curriculum or prepared set of learning/play activities
CCDF	1.35**	0.41	-0.09	-0.05	0.11
	(0.43)	(0.30)	(0.24)	(0.08)	(0.07)
Treated State	-0.39	-0.43	-0.03	-0.23	0.22
	(1.47)	(0.75)	(0.56)	(0.18)	(0.15)
DDD (CCDF*Treated State*Post)	1.51	-0.21	1.23**	0.38*	-0.22*
	(1.09)	(0.63)	(0.47)	(0.18)	(0.11)
Observations	5600	5600	5600	5600	5600

Note. Treated states represent states who reached the 50th percentile of market reimbursement rates for the preschool age group. DC and Michigan had missing CCDF plans or no listed percentiles and were not included in the analyses. Analyses excludes providers who are both relationship-based and unpaid. N's are rounded to the nearest 20, and all coefficients are rounded to three significant digits per confidentiality agreement with NORC. Clustered standard errors in parentheses. Models are weighted using NSECE sampling weights. Each column represents a separate outcome and a separate regression. All regressions include state and year fixed effects and time-varying state and center covariates. Provider covariates include the provider's years of experience, if provider has a bachelor's degree, and provider's self-rated health. State covariates include the ratio of gross state product (GSP), ratio of Temporary Assistance for Needy Families (TANF) recipients, fraction of State Senate that is Democrat, poverty rate, unemployment rate, percent population Hispanic/Latino, and percent population white/Caucasian. Nonstandard hours include evenings, overnight, and weekend. + $p<0.10$. * $p<0.05$. ** $p<0.01$. *** $p<0.001$.