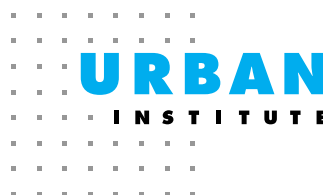U.S. Department of Health and
Human Services,
Office of the Assistant Secretary for
Planning and Evaluation

# Effects of the CCDF Subsidy Program on the Employment Outcomes of Low Income Mothers

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## Executive Summary

The Child Care and Development Fund (CCDF) provides access to child care for low-income families so they can work, attend school, or enroll in training to improve the well-being of their families and support early learning and development of their children. Research generally has demonstrated the employment benefits of providing child care, but studies of the effects of child care policies on parents' employment outcomes have mostly been conducted in non-U.S. contexts (e.g., Quebec, Norway, Argentina) or were conducted using data from prior to and just following welfare reform in the 1990s. This study provides policymakers and researchers with recent data on the effects of CCDF funding and policies on U.S. maternal labor force participation and employment outcomes.

In examining different CCDF policy[1] and expenditure parameters, we hypothesized that higher levels of spending on child care subsidies[2] would result in a higher employment probability among potentially eligible women, defined as having family incomes less than 85 percent of state median income (SMI) and with children ages 0 to 12. We hypothesized that more generous subsidy policies – in particular, lower copayments and higher income eligibility thresholds – would draw more potentially eligible women into the workforce by providing lower out-of-pocket payments. We also expected that allowing job search as a qualifying activity for initial eligibility would give parents a better chance of successfully finding a job and thus be associated with a higher probability of employment. Additionally, we expected that a longer redetermination period would be associated with a higher probability of employment by providing greater child care stability.

To test these hypotheses, we merged demographic and state-level data on income and employment from the Current Population Survey Annual Social and Economic Supplement (2003-2012) with CCDF expenditures from ACF-696 data and CCDF policy parameters from the CCDF State Policies Database (2003-2012; 2009-2012 only for job search policy and redetermination period). In order to estimate the effects of changes in CCDF expenditures and policies on maternal employment outcomes, we used a difference-in-differences approach and accounted for state fixed effects, national trends over time, and other factors. This approach takes advantage of many years of data on state CCDF policy changes and overcomes several methodological challenges in isolating the effects of CCDF on employment.

While the CCDF program should not have affected employment among ineligible women, it is possible that CCDF policy changes could have been correlated with omitted state policies or variables that affect all residents, even after controlling for measureable contaminating factors. It is also possible that states could vary their CCDF parameters in response to employment rates. By comparing changes in employment rates among the potentially eligible population to those likely ineligible in states, we are able to identify the differential impact of a change in CCDF policy or funding on the employment outcomes of eligible, relative to ineligible women.

As hypothesized, we found that higher CCDF expenditures increased employment rates of mothers potentially eligible for subsidies. The elasticity of employment with respect to CCDF expenditures is .05 for women with children ages 0 to 12, and .07 for women with children ages 0 to 3. That is, a 10 percent

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[1] Data are from 2003-2012, prior to the 2014 reauthorization of the Child Care and Development Fund (CCDF)

[2] Spending on child care subsidies takes into account the number of children ages 0 through 12 in each state.

increase in expenditures predicts a 0.5 and 0.7 percent increase in employment among potentially eligible women with children ages 0 to 12 and ages 0 to 3, respectively. These effects are comparable to elasticities reported in prior research. In absolute terms, if current CCDF expenditures were tripled, we estimate that the number of women newly employed would be:

- 652,000 among women below 85 percent of SMI with children ages 0 to 12
- 376,000 among women below 85 percent of SMI with children ages 0 to 3

Income eligibility thresholds and copayment policies were related to employment outcomes, but the relationships were not robust across analytic samples. In states with lower income thresholds, the probability of maternal labor force participation increased among potentially eligible mothers with family incomes under 85 percent of SMI, as well as among potentially eligible mothers under 70 and 50 percent of SMI. Possible explanations could be that lower income eligibility thresholds allow states to target funds to those most in need of employment support, or that states with more generous income eligibility limits are more likely to serve mothers who are already more stably employed. However, income thresholds were not related to the labor force participation of two subgroups: single mothers and mothers with young children.

We also found that requiring lower family copayment rates decreased the probability of employment and the probability of labor force participation among potentially eligible mothers with family incomes under 85 percent of SMI, as well as among potentially eligible mothers under 70 and 50 percent of SMI. We initially hypothesized that lower copayments would further decrease the cost of child care for families, thus encouraging maternal employment.  However, because CCDF funding is limited, setting higher copayment rates may allow states to lower state subsidy rates and stretch resources to provide subsidies to a greater number of potentially eligible mothers.  These findings are particularly notable because there is little published research on the effects of state CCDF income eligibility thresholds and copayment policies on employment. However, similar to the finding for income thresholds, copayment rates were not related to the labor force participation samples of two subgroups: single mothers and mothers with young children.

Finally, we found that neither allowing job search as an activity for initial CCDF eligibility nor lengthening redetermination periods affected the employment probability of potentially eligible mothers. Note that for these two parameters we only had data from 2009 to 2012.

This study faced several limitations. First, the measure of CCDF expenditures used in this study only captures a portion of total state child care subsidy investments (states can also directly invest Temporary Assistance for Needy Families (TANF) and Social Service Block Grant (SSBG) funds to support child care). Second, women who are not working, but whose family income would have made them ineligible had they been working, are nonetheless considered "potentially eligible" in this study[3]. Third, the study constructs a "potentially eligible" group based on child age (0 to 12 years) and family income (under 85 percent of SMI, then 70 percent and 50 percent). However, in practice, states have much more detailed

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[3] For example, consider a two-parent household where the mom does not work, but the working dad's income puts the family at 80 percent of SMI. This family would be considered "likely-eligible" under the current analysis. However, if the mom were to gain employment, the family would almost certainly become income ineligible.

rules governing eligibility determination. Despite these limitations, the findings are robust to different modeling assumptions.

These findings have important implications for child care policies, and employment policies in general. Not only do they suggest that increasing expenditures on subsidized child care can increase employment among low-income mothers, but also that child care subsidies should be considered as one approach to increasing employment.

## Key Findings

- Higher child care expenditures increase the employment rates of potentially eligible mothers.
- Consistent with prior research, the elasticity of employment with respect to CCDF expenditures was .05 for women with children ages 0 to 12 and .07 for women with children ages 0 to 3.
- Higher copayment rates and lower income eligibility thresholds (that is, less generous child care policy) increased the employment rates of potentially eligible mothers. However, these relationships were not robust across some subsamples of women (i.e., single women; women with young children).
- The employment rates of potentially eligible mothers were unrelated to allowing job search as an activity for initial CCDF eligibility and also unrelated to the length of CCDF eligibility redetermination periods.

# Introduction

One of the purposes of the Child Care and Development Fund (CCDF) is to provide parents with child care to enable their work. In FY2014, 1.4 million children (from 853,000 families) received subsidies through this program averaging $4,800 per year. Total spending on direct services was $6.6 billion in FY 2014 (most recent year available). Supporting parental employment remains an important goal of the CCDF, and recent legislative and administrative efforts have also emphasized supporting children's development and improving the quality of its programs. While research generally supports the employment benefits of child care more generally, there are a limited number of studies that have assessed the employment benefits of CCDF-funded child care in particular, and in the United States context.[4] This study aims to fill that gap and provide a contemporary understanding of how CCDF funding and policies influence maternal employment across states.

Children who are 12 years of age or younger, and children up to 18 with special needs, are eligible to receive CCDF subsidies. Although broad parameters at the federal level define eligibility to receive subsidies, eligibility varies by state. Federal parameters are based on child age, parent engagement in work or educational/training activities, and a family income under 85 percent of the state median income (SMI). However, more specific criteria set by each state function as the de facto set of eligibility rules. For example, states determine their own requirements related to minimum hours of work or training, and set income thresholds that are almost always lower than the federal threshold. Between 2003 and 2012, the mean state threshold was 56 percent of SMI, and as such, many women with incomes below the federal 85 percent SMI cut-off were not actually eligible in their states.

Aside from these state-based eligibility requirements, uptake of subsidies is also limited by funding appropriations. In fiscal year 2012, the most recent year for which data are available, only 15 percent of children eligible for CCDF actually received the subsidy, and states regularly have waiting lists for participants to receive funds.

This study's central research aim was to examine how *expenditures on child care subsidies*, *copayment rate policies* and *income eligibility thresholds* affect the employment and labor force participation of potentially eligible mothers. Initial analysis focused on all potentially eligible mothers. Further analysis considered two subgroups of women of particular interest: single mothers, and mothers with children ages 0 through 3. The latter group is less likely to be employed than mothers with preschool- or school-aged children[5], and has been the focus of attention and policy proposals to increase access to child care subsidies in order to pursue, among other goals, increased labor force participation of this population.[6]

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[4] Morrissey, T (2016). Child care and parent labor force participation: A review of the research literature. *Review of Economics of the Household.* doi:10.1007/s11150-016-9331-3

[5] Wolf, S. and Morrissey, T. ASPE Brief: Associations between child care arrangements and parental labor force participation: an analysis using the Survey of Income and Program Participation. (Forthcoming).

[6] White House Fact Sheet: Helping All Working Families with Young Children Afford Child Care. Retrieved from https://www.whitehouse.gov/the-press-office/2015/01/21/fact-sheet-helping-all-working-families-young-children-afford-child-care.

We examine not only employment, but also labor force participation. The relationship between child care policy and employment is more straightforward, that is, affordable child care allows women to work. But subsidy policy may also influence labor force participation because in many states[7], families may qualify for subsidies via job search activities.

We assessed the robustness of the findings by using various income cutoffs to define our analytic sample. The initial analysis used an income cutoff of 85 percent of SMI (the federal CCDF income eligibility limit) to define the families we include in our analyses, and we do additional analyses using a cutoff of 70 and 50 percent of SMI. The analyses using alternative income cutoffs may more accurately capture families who are actually eligible under state eligibility rules, and those who are likely to be served, given lower state income thresholds and state efforts to serve the families most in need of assistance in accessing affordable child care.

The underlying assumption of this study is that a substantial proportion of low income mothers who were not working would be working if they had stable, safe child care arrangements. Because increases in state expenditures result in an increased number of subsidy recipients, we expected that higher levels of spending on child care subsidies would result in a higher likelihood of employment among potentially eligible mothers. Additionally, we expected that more generous subsidy policies – in particular, lower copayments and higher income eligibility thresholds – would draw more potentially eligible women into the workforce by creating lower out-of-pocket payments for more women.

Finally, we expected that allowing job search as a qualifying activity for initial eligibility would give mothers a better chance of successfully finding a job and thus be associated with a higher probability of employment. Additionally we expected that when states set longer periods for eligibility redetermination (twelve versus six months) we would see a higher probability of employment by providing greater child care stability. We conduct separate analyses for job search and length of determination period because fewer years of data are available for these two variables.

## Analytical strategy

To obtain a clear picture of the effects of the CCDF program on employment, we conducted a quasi-experimental analysis of the predicted effects of CCDF policy parameters on the likelihood of employment of potentially eligible mothers, relative to ineligible women. We focused the analysis on mothers because previous research[8] demonstrates that women do more of the caregiving and that child care price and availability constrain employment of mothers more than fathers. In addition, focusing on mothers allowed direct comparisons to other studies of the effects of child care on employment that focus exclusively on mothers. [9]

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[7] Job search is an allowable activity for continuing eligibility in 38 states, and of those states, job search is an allowable activity for initial eligibility in 19 states.

[8] Bureau of Labor Statistics (2015). American Time Use Survey Summary – 2014 Results. Retrieved from: http://www.bls.gov/news.release/atus.nr0.htm

[9] For comparable research using samples of mothers, see Tekin (2007), Herbst (2010), Bainbridge, Meyers, &

We hypothesized that changes in CCDF funding and policies would have a larger impact on eligible women than ineligible women because the program is directed to them. We thus focused analyses on the differential effect of these variables on the employment of eligible vs. ineligible women. While the CCDF program parameters should not affect ineligible women, CCDF funding and policy parameters could potentially be correlated with variables omitted from this model, such as state policies that affect all residents, even after controlling for measureable factors such as the state unemployment rate and state median income. In addition, the number of potentially eligible mothers employed could be endogenous to the CCDF variables at the state level, suggesting that states might vary their CCDF parameters in response to employment rates. Using a difference-in-differences approach allowed us to account for endogeneity by identifying the differential impact of a change in CCDF policy or funding on the employment outcomes of potentially eligible vs. ineligible women. Difference-in-differences models have been used in a variety of contexts to assess causal effects with observational data.[10] They rely on an interaction term between the variable of interest and a dummy variable indicating the reference group.[11]

We compared the employment outcomes of women who were potentially eligible for CCDF subsidies to those unlikely to be eligible but comparable in terms of income and age. In the main model, the potentially eligible group was composed of women ages 18 to 45 whose family income was at most 85 percent of SMI and who had children ages 0 to 12. The ineligible women also had family incomes up to 85 percent of the SMI and were in the same age range but did not have children ages 0 to 12. One limitation of this approach was that some women who were "potentially eligible" would actually not be eligible if they worked because their new household income once they were employed would put them above 85 percent of the SMI.

Finally, we assessed the robustness of the findings by using different income cutoffs to define eligibility. Although for our main analysis we used the federal income cutoff of 85 percent of the SMI to capture all potentially eligible women, making the chosen sample the pool of all potentially subsidy-eligible women, we recognized that this cutoff may be too liberal because many states set lower income thresholds. Our analyses therefore also used income cutoffs of 70 and 50 percent of SMI which more accurately capture families eligible under state eligibility rules.[12]

## Data

We drew data from the Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC) for calendar years 2003 through 2012 and merged it with data on CCDF funding and policy

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Waldfogel (2003), and Connelly & Kimmel (2003).

[10] See for example Bertrand, Duflo, & Mullainathan (2004).

[11] In nonlinear models like probit models, interaction terms have been shown to be difficult to interpret (Ai & Norton, 2003), and our models incorporate various interaction terms. As Puhani (2012) shows, this is not a concern in difference-in-differences models, where the focus is on the treatment effect as estimated by the difference-in-differences estimate.

[12] Note that our assessment of potential eligibility for this analysis does not take into account all of the detailed rules governing real-world eligibility, such as the disregard of certain types of income and state-specific definitions of the family unit.

parameters. The CPS-ASEC contains individual-level data on employment outcomes, income, demographic characteristics, and state of residence, collected consistently across years.[13] The base sample size for the analysis is 238,030. Data on the CCDF policy parameters are from the CCDF Policies Database, which is funded by the Administration for Children and Families (ACF) and maintained at the Urban Institute.[14] For some parameters data were only available from 2009 to 2012.

Expenditures information comes from ACF program data[15], covering the period from 2003 to 2012. It should be noted that CCDF expenditures are not a perfect measure of state and federal spending on child care subsidies. In addition to funding from CCDF, states may also use Temporary Assistance for Needy Families (TANF) and Social Service Block Grant (SSBG) funds to cover child care subsidies. For example, in 2013, TANF-direct, excess TANF MOE[16], and SSBG funds[17] accounted for approximately 32 percent of dollars spent directly on subsidies. While CCDF expenditure data include TANF funding transferred to CCDF, they do not include TANF-direct, excess TANF Maintenance of Effort (MOE), or SSBG spending on child care. Reliable per-child data on state-level expenditures of TANF and SSBG dollars on child care subsidies are not available. It is unclear whether excluding state TANF and SSBG dollars affects measurement error, or more problematically, biases results. Nonetheless, CCDF expenditures remain the best available measure of state subsidy expenditures.

Table 1 shows descriptive statistics for the analysis variables for the total sample, and for potentially eligible and ineligible women. The mean annual CCDF direct services expenditure per state is $387 million, and the mean expenditure per child ages 0 to 12 (all children, not only subsidy receiving children) is $181. The average state income eligibility threshold is 56 percent of the SMI for a family of three. On average, families with one adult and two children and an annual income of $15,000 spend $69 per month on child care copays. Among all the women in ages 18 to 45 with income up to 85 percent SMI, potentially eligible mothers have lower work participation relative to ineligible women across all dimensions of employment: fewer weekly hours, lower employment rates, and more part-time employment among workers. For instance, 51 percent of potentially eligible mothers are working in comparison to 64 percent of ineligible women. Potentially eligible mothers are also less likely to be married, more likely to be Latino and foreign-born, and less likely to have a high school diploma than ineligible women. Since these factors are associated with employment outcomes, it is important to include them as controls in estimating the effects of CCDF parameters.

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[13] For technical documentation on the CPS-ASEC, see: https://www.census.gov/programs-surveys/cps/technical-documentation/complete.html.

[14] Data and documentation are available at: http://www.acf.hhs.gov/programs/opre/research/project/child-care-and-development-fund-ccdf-policies-database-2008-2013.

[15] For expenditure data (all appropriation years) see: http://www.acf.hhs.gov/programs/occ/resource/ccdf-expenditure-data-all-years. For caseload data see: http://www.acf.hhs.gov/programs/occ/resource/ccdf-statistics.

[16] For TANF expenditure data by category, see: http://www.acf.hhs.gov/programs/ofa/resource/tanf-financial-data-fy-2013

[17] U.S. Department of Health and Human Services, Administration for Children and Families, Office of Community Services. (2015). Social Services Block Grant Program Annual Report 2013. Retrieved from http://www.acf.hhs.gov/programs/ocs/programs/ssbg

**Table 1. Descriptive Statistics**

| | All | | Likely eligible: With income up to 85% of the SMI and with children ages 0 to 12 | | Likely ineligible: With income up to 85% of the SMI and no children ages 0 to 12 | |
|---|---|---|---|---|---|---|
| | Mean | SD* | Mean | SD* | Mean | SD* |
| **Personal characteristics** | | | | | | |
| Married | 0.46 | -- | 0.32 | -- | 0.62 | -- |
| Black | 0.14 | -- | 0.13 | -- | 0.15 | -- |
| Latino | 0.34 | -- | 0.40 | -- | 0.26 | -- |
| White | 0.44 | -- | 0.39 | -- | 0.49 | -- |
| No high school diploma | 0.24 | -- | 0.29 | -- | 0.18 | -- |
| Foreign Born | 0.31 | -- | 0.37 | -- | 0.24 | -- |
| Age | 31 | 7.86 | 31 | 7.04 | 31 | 8.69 |
| **CCDF program variables by state/year** | | | | | | |
| Total expenditures ($1,000's) | $387,000 | $432,000 | $401,000 | $449,000 | $370,000 | $417,000 |
| Total expenditures/ population 0 to 12 | $181 | $60 | $178 | $59 | $183 | $61 |
| Eligibility threshold for family of 3 | $2,757 | $584 | $2,753 | $578 | $2,761 | $590 |
| Eligibility threshold for family of 3/SMI | 0.56 | 0.12 | 0.56 | 0.12 | 0.56 | 0.12 |
| Monthly copay for family of 3,  2 kids, income of $15,000 | $69 | $66 | $70 | $66 | $69 | $66 |
| Annual Copay for family of 3,  2 kids, income of $15,000/$15,000 | 0.06 | 0.05 | 0.06 | 0.05 | 0.06 | 0.05 |
| Job search allowed for initial eligibility | 0.16 | -- | 0.16 | -- | 0.17 | -- |
| Longer determination period (12 mo) | 0.25 | -- | 0.24 | -- | 0.25 | -- |
| **State characteristics** | | | | | | |
| Unemployment rate | 6.63 | 2.31 | 6.62 | 2.30 | 6.64 | 2.33 |
| State median income-monthly (SMI) | $4,909 | $763 | $4,887 | $755 | $4,934 | $772 |
| **Work outcomes** | | | | | | |
| Employed | 0.57 | -- | 0.51 | -- | 0.64 | -- |
| In the labor force | 0.64 | -- | 0.58 | -- | 0.70 | -- |
| **Sample size** | 238,030 | | 126,873 | | 111,157 | |

*Standard deviations are computed for continuous variables only.

## Variables and Estimated Equations

The primary analysis used these state CCDF variables:

- State CCDF annual expenditures,[18] divided by the total number of children ages 0 to 12 in the state
- State CCDF income eligibility threshold for a family of three, divided by the SMI
- State annual copayment for a family of three with two children ages 24-48 months with an annual income of $15,000,[19] divided by $15,000

Separate analyses examined the following CCDF variables:

- Whether or not the state allows job search for initial eligibility
- State CCDF eligibility redetermination period length (6 or 12 months)

All these variables were measured annually at the state level from 2003 to 2012, with the exception of data on job search and redetermination period policies, which are available only from 2009 to 2012.

The analyses considered personal characteristics related to labor market opportunities and returns to work and determined by data availability. Specifically, we looked at age, race/ethnicity, marital status, and educational attainment, all of which are personal characteristics commonly included in models of employment outcomes.

We estimated models for the following employment outcomes as follows:

(1) Employment, assigning a value of 1 if the woman was employed at the time of the survey and 0 for all other women, including those unemployed and not in the labor force.

(2) Labor force participation, assigning a value of 1 if the woman was in the labor force, 0 otherwise. We considered women to be in the labor force if they were either employed or looking for work.

The basic equation for estimating the probability of employment, EQ 1, can be expressed as follows:

$$
\begin{aligned}
EQ\ 1: Employed_{ist} &= \beta_0 + \beta_1 Eligible_{ist} + \beta_2 CCDF\ Expenditures_{st} + \beta_3 CCDF\ Expenditures_{st} \\
&\quad * Eligible_{ist} + \beta_4 Income\ Threshold_{st} + \beta_5 Income\ Threshold_{st} * Eligible_{ist} \\
&\quad + \beta_6 Copay_{st} + \beta_7 Copay_{st} * Eligible_{ist} + \beta_8 Unemp_{st} + \beta_9 Year_t + \sum_{s=1}^{49} \gamma_s State_s \\
&\quad + X_{ist}\lambda + \epsilon_{ist}
\end{aligned}
$$

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[18] State CCDF annual expenditures comprise a majority, but not the entirety of state child care subsidy expenditures.

[19] Copayment rates vary by family size, family income, and other family characteristics. A family of three with an income of $15,000 can be thought of as a "typical" family receiving child care subsidies.

In this equation *i*, *s*, and *t* represent indices for person, state, and year, respectively, $\gamma$ represents the state fixed effects, *X* is a matrix of individual-level characteristics, and $\lambda$ the coefficients on these variables. State fixed effects were included to account for unobservable, non-varying, state-level characteristics that could affect women's employment outcomes. Year effects were included to account for factors in the national economic and policy environment that would affect employment outcomes. The term *CCDF Expenditures* refers to yearly expenditures per population ages 0 to 12; *Copay* to the state annual copayment for a family of three with two children ages 24 to 48 months with an income of \$15,000, divided by \$15,000; *Income Threshold* to the state income eligibility threshold for a family of three relative to the state median income; and *Unemp* to the state annual unemployment rate. The difference-in-differences coefficients showing the effects of CCDF programs on potentially eligible mothers are given by the interaction between the CCDF variables and the dummy variable *Eligible*, indicating that the woman is potentially eligible for subsidies: $\beta_3$, $\beta_5$, and $\beta_7$. All models use a probit model.

Results from EQ 1 suggested that unmeasured factors correlated with the CCDF variables may have produced unexpected effects on the employment outcomes. To account for this possibility, we added two sets of variables: (1) the state median income (SMI); and (2) interactions between the unemployment rate and the CCDF variables. The SMI controls for systematic differences across states in wages or benefits from working (while income includes earnings beyond wages, SMI is good proxy for benefits from working). For example, higher-income states may be in a better fiscal position to provide child care services to lower-income mothers. We included interactions of the CCDF variables and unemployment in the estimations because it is possible that states look at the employment situation in setting their parameters. For instance, when the unemployment rate is high, states may try to help lower-income mothers by setting higher income eligibility thresholds. If so, a higher eligibility threshold would be correlated with lower employment. Similarly, unemployment rates and funding levels may be related. Unemployment enters indirectly in the federal allocation of CCDF through consideration of the number of children in a state who receive free or reduced school meals when granting CCDF funds. While the coefficients on these variables are not statistically or substantively significant, we chose to include them in the model for their theoretical importance.

The preferred model thus includes these two new variables and has the following specification:

$$
\begin{aligned}
EQ\ 2:\ Employed_{ist} \\
= \beta_0 + \beta_1 Eligible_{ist} + \beta_2 CCDF\ Expenditures_{st} + \beta_3 CCDF\ Expenditures_{st} \\
* Eligible_{ist} + \beta_4 Income\ Threshold_{st} + \beta_5 Income\ Threshold_{st} * Eligible_{ist} \\
+ \beta_6 Copay_{st} + \beta_7 Copay_{st} * Eligible_{ist} + \beta_8\ Unemp_{st} + \beta_9 Year_t \\
+ \beta_{10} SMI_{st} + \beta_{11} Unemp_{st} * CCDF\ Expenditures_{st} + \beta_{12} Unemp \\
* Income\ Threshold_{st} + \beta_{13} Unemp * Copay_{st} + \sum_{s=1}^{49} \gamma_s State_s + X_{ist}\lambda + \epsilon_{ist}
\end{aligned}
$$

## Findings

Overall, we found that higher CCDF expenditures were related to a higher probability of employment among potentially eligible mothers. This effect was robust when looking at both employment and labor

force participation, and across different subsamples of women. Higher copayments and lower state income eligibility thresholds were also associated with a higher probability of employment among potentially eligible mothers, but the robustness of this finding varied  across the different samples of women. We found no statistically or substantively significant findings for CCDF job search allowance or length of eligibility redetermination period.

## Expenditures

Model 1 as shown in Table 2 is derived from the basic equation EQ 1 described above. Model 2 adds SMI to the estimation to account for economic conditions of the states, and Model 3 adds interactions between the CCDF variables and the state unemployment rate. Model 4 includes both SMI and the unemployment rate interactions as in equation EQ 2, and is thus the preferred model because it accounts for a relationship between CCDF and unemployment conditions and includes SMI as a further control on state-level factors that may affect the CCDF-employment relationship. Appendices 1-4 include full results for all four models.

## Table 2. Estimated Effects of CCDF Variables on Employment Outcomes

| | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| **Model 1** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **-0.277** | 0.155 | **-0.282** | 0.154 |
| (b) Eligible*Expenditures | **0.369**** | 0.147 | **0.441**** | 0.180 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.106** | 0.070 | **0.025** | 0.102 |
| (d) Eligible* Income eligibility threshold | **-0.150*** | 0.080 | **-0.214**** | 0.078 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.296**** | 0.116 | **-0.366**** | 0.104 |
| (f) Eligible*Copay | **0.347**** | 0.141 | **0.339**** | 0.145 |
| | | | | |
| **Model 2: with SMI** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **0.301*** | 0.150 | **-0.320*** | 0.140 |
| (b) Eligible*Expenditures | **0.370**** | 0.147 | **0.442**** | 0.180 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.045** | 0.072 | **0.119** | 0.093 |
| (d) Eligible* Income eligibility threshold | **-0.152** | 0.080 | **-0.217**** | 0.079 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.298**** | 0.112 | **-0.369**** | 0.104 |
| (f) Eligible*Copay | **0.346**** | 0.141 | **0.339**** | 0.145 |
| | | | | |
| **Model 3: no SMI, with interactions of CCDF variables with unemployment rate** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **0.072** | 0.285 | **-0.320** | 0.303 |
| (b) Eligible*Expenditures | **0.369**** | 0.146 | **0.440***** | 0.180 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.216*** | 0.105 | **-0.170** | 0.154 |
| (d) Eligible* Income eligibility threshold | **-0.148** | 0.080 | **-0.213**** | 0.078 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.048** | 0.253 | **-0.299** | 0.290 |
| (f) Eligible*Copay | **0.348**** | 0.142 | **0.339**** | 0.146 |
| | | | | |
| **Model 4: With SMI and interactions of CCDF variables with unemployment rate** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **0.131** | 0.282 | **-0.233** | 0.299 |
| (b) Eligible*Expenditures | **0.369**** | 0.146 | **0.441**** | 0.179 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.139** | 0.109 | **-0.057** | 0.150 |
| (d) Eligible* Income eligibility threshold | **-0.150** | 0.080 | **-0.216**** | 0.079 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.126** | 0.275 | **-0.411** | 0.308 |
| (f) Eligible*Copay | **0.347**** | 0.141 | **0.338**** | 0.146 |
| | | | | |
| N | 238,030 | | 237,783 | |

Notes: All estimations include age and ages squared, unemployment rate, data year, and dummy variables for race/ethnicity, marital status, no high school diploma, foreign-born, and state of residence. Sample is composed of women ages 18-45 and with income up to 85% of SMI. Potentially eligible refers to women with children ages 0-12. ** $p<=0.01$; * $p\leq0.05$

For expenditures, lines labeled (b) on Table 2 show coefficients for the main parameter of interest, the difference-in-differences parameter showing the effect of CCDF expenditures per population on potentially eligible mothers, relative to ineligible women. Lines (a), the main effect of CCDF expenditures, represent the coefficients for ineligible women, defined as those below the same income cutoff but with no children. For income eligibility thresholds, which are divided by the median SMI, lines (d) show the effect of income eligibility thresholds on the probability of employment for potentially

eligible mothers, relative to ineligible women. Lines (c) represent the effect of income eligibility thresholds on the probability of employment among ineligible women. Similarly, for copay, which is operationalized as the copayment rate for a family of three with an income of $15,000, divided by $15,000, lines (f) show the effect of copayment rates on potentially eligible mothers (relative to ineligible women) and lines (e) the effect on ineligible women.

Table 3 reports results from models on specific subgroups of women. Panel A shows results for single women, where "potentially eligible" refers to single women with children and "ineligibles" are single women without children. Panel B show estimates for all women with children 0 to 3, where "potentially eligible" refers to all women with children ages 0 to 3 (including women who also have older children), and "ineligibles" are women without children ages 0 to 12.

**Table 3. Estimates of the Effects of CCDF Variables on Employment Outcomes: Sub Samples of Women According to Marital Status and Age of Children**

| | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| **Panel A. Model 4: "Potentially eligible" refers to single women with children; "ineligibles" are single women without children** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **0.508** | 0.428 | **0.200** | 0.378 |
| (b) Eligible*Expenditures | **0.437*** | 0.226 | **0.439*** | 0.230 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.043** | 0.165 | **0.116** | 0.211 |
| (d) Eligible*Income eligibility threshold | **-0.087** | 0.112 | **-0.191** | 0.112 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.277** | 0.408 | **-0.308** | 0.385 |
| (f) Eligible*Copay | **0.183** | 0.248 | **0.241** | 0.237 |
| N | **129,206** | | **129,060** | |
| **Panel B. Model 4: "Potentially eligible" refers to all women with children 0 to 3 (including women who also have older children); "ineligibles" are women without children ages 0 to 12** | | | | |
| (a) Expenditures per population 0 to 12 ($1,000's) | **0.378** | 0.361 | **0.011** | 0.349 |
| (b) Eligible*Expenditures | **0.474*** | 0.197 | **0.493*** | 0.240 |
| (c) Income eligibility threshold/SMI, fam. of 3 | **-0.287*** | 0.136 | **-0.159** | 0.167 |
| (d) Eligible*Income eligibility threshold | **-0.096** | 0.116 | **-0.151** | 0.105 |
| (e) Copay for family of 3, $15,000 income/$15,000 | **-0.235** | 0.314 | **-0.510** | 0.324 |
| (f) Eligible*Copay | **0.347** | 0.207 | **0.284** | 0.213 |
| N | **170,907** | | **170,704** | |

All estimations include the variables indicated in EQ 4 in text. Sample is composed of women ages 18-45 and household income up to 85% of SMI. **$p<=.01$; *$p<=.05$.

The effect of expenditures was stable and robust across models, demonstrating that a higher level of expenditures led to a higher probability of employment for potentially eligible mothers, relative to ineligible women. In Table 2, Model 4, the relationship was observed (line b) both when the outcome was employment (coefficient = 0.369) and when the outcome was labor force participation (coefficient = 0.441). In Table 3, the relationship continued to be robust across samples of single mothers and mothers with young children ages 0 to 3 (also across both employment and labor force participation). The magnitude of the employment effects were not statistically different between analyses using the whole-

group (coefficient = 0.369), single mothers (coefficient = 0.437), and mothers with young children (coefficient = 0.474).

Results were also qualitatively the same, for both employment and labor force outcomes, across two alternative measures of CCDF expenditures (not shown): (1) expenditures on direct services (i.e., actual subsidies) per population 0 to 12, and (2) average number of families served. Expenditures on direct services is a more direct measure of funding spent on subsidies, whereas total expenditures also include spending on quality and other goals that may have less of a direct impact on employment. Number of families served is useful to assess because we would expect the number of families served to be related to the number of families employed.

We calculated the elasticities of employment and labor force participation with respect to CCDF total expenditures per child age 0 to 12 for different groups of women using calculated marginal effects based on the coefficients in Tables 2 (Model 4) and 3. The elasticities show the percent change in employment or labor force participation probabilities for each one percent change in expenditures (Table 4).

**Table 4. Elasticities of Employment and Labor Force Participation (for a percentage change in Child Care Expenditures)**

| Group | Employment | Labor Force Participation |
|---|---|---|
| Eligible women with children ages 0 to 12 | 0.048* | 0.047* |
| Eligible single women with children ages 0 to 12 | 0.058* | 0.052* |
| Eligible women with children ages 0 to 3 | 0.068* | 0.059* |

*Statistically significant at $p<0.05$ based on the standard error of the coefficient. Elasticities are evaluated at the means of the target population using the marginal effect of the probit estimations.

For example, a 10 percent increase in state CCDF expenditures predicts a half of a percent increase in employment among all potentially eligible mothers with children ages 0 to 12. The average expense per child ages 0 to 12 (all children, not just subsidy recipients) over the sample period was $180. Increasing expenditures by 50 percent predicts an increase in the employment rate of women with children ages 0 to 12 of 2.4 percent or 1.2 percentage points. Considering that the number of eligible women in 2012 was 13.8 million and that 50 percent of them were working, this increased expenditure could mean 163,000 additional employed mothers. Among women with children ages 0 to 3, employment is estimated to increase by 3.9 percent, about 2.1 percentage points and equivalent to 94,000 additional employed mothers.

Various studies have estimated the elasticity of child care expenditures with respect to employment, but most of these studies use expenses incurred by families, not CCDF expenditures.[20] In a review of the literature, Morrissey (2016) reports a range of elasticities from -.025 to -1.1.

The most comparable estimates to ours are those estimated in Herbst (2010) and Bainbridge, Meyers and Waldfogel (2013). The study by Herbst (2010) is quite different in specification and focuses on single women ages 21 to 64 from 1991 to 2005, and reports that when CCDF expenditures increase by $100, the probability that single mothers will be employed increases by 1.7 percentage points. Our model estimates

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[20] See references in Morrissey (2016).

that such an increase of $100 would result in a 1.6 percentage point increase in the probability of employment. Our estimates are also comparable to those reported in the Bainbridge, Meyers and Waldfogel study, which used CPS data for 1992 to 1997 for single mothers. These authors estimated that when the total CCDF funds increased by $1,000, the employment rate of single mothers increased by 26 percent. Our model estimates that such an increase of $1,000 would increase the employment of single mothers by 33 percent, although our expenditure estimates are divided by the number of children ages 0 to 12, not by the number of single women.

### Copay and Income Thresholds

Our next analyses revealed that higher copay levels were associated with a higher probability of employment among potentially eligible mothers, relative to ineligible women. In Table 2, Model 4, this relationship could be seen (row f) both when the outcome was employment (coefficient = 0.347) and when the outcome was labor force participation (coefficient = 0.338). These effects correspond to a 1.27 percent increase in the probability of employment, and 1.17 percent increase in the probability of labor force participation, for a $1,500 increase in annual copayment. However, the relationship between copay and employment, and the relationship between copay and labor force participation, was not significant for the subsamples of single women and women with young children (Table 3). Also note that for Table 2, Models 2 and 3, there was a significant negative relationship between copayment rates and the employment probability of ineligible women, which highlights the importance of using the difference-in-differences methodology to examine employment effects on potentially eligible mothers, separate from overall employment trends.

Our analyses also showed that higher income eligibility thresholds were associated with a lower probability of being in the labor force for potentially eligible mothers, relative to ineligible women. However, this relationship was only observed when the outcome is labor force participation. In Table 2, Model 4, the coefficient is -0.216, which corresponds to a .75 percent decrease in the probability of labor force participation for an increase in income thresholds equivalent to 10 percent of the median SMI. Income threshold did not have an effect on employment, and furthermore the relationship to labor force participation was only observed for the whole sample of women, not among subgroups of women (Table 3). As such, the relationship between employment and income eligibility thresholds was less robust than the relationship between employment and expenditures.

There is little research against which to compare these results. Unlike the current study, two studies employing randomized samples (Michalopoulos, 2010; Michalopoulos, Lundquist, & Castells, 2010) found no effect of either copay or income thresholds on employment.

### Sensitivity of Results to Alternative Income Cutoffs

The analyses in Tables 2 and 3 used a cutoff of 85 percent of SMI. To assess the sensitivity of the results, we also conducted analyses using 70 and 50 percent of SMI. That is, we defined the potentially eligible and ineligible women in two alternative analyses as being below 70 and 50 percent of SMI, respectively. Results are reported in Table 5.

**Table 5. Estimated Effects of CCDF Variables on Employment: Alternative Income Cut-Offs**

| | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| **Women up to 70% of SMI, with and without children ages 0 to 12** | | | | |
| Expenditures | **0.244** | 0.326 | **-0.057** | 0.294 |
| Eligible*Expenditures | **0.360**** | 0.148 | **0.456*** | 0.186 |
| Income Threshold | **-0.212** | 0.121 | **-0.143** | 0.165 |
| Eligible*Income Threshold | **-0.159** | 0.083 | **-0.219**** | 0.080 |
| Copay per income | **-0.111** | 0.307 | **-0.376** | 0.320 |
| Eligible* Copay per Income | **0.361**** | 0.135 | **0.332*** | 0.141 |
| | | | | |
| **Women up to 50% SMI, with and without children ages 0 to 12** | | | | |
| Expenditures | **0.319** | 0.379 | **-0.094** | 0.397 |
| Eligible*Expenditures | **0.406*** | 0.179 | **0.494**** | 0.181 |
| Income Threshold | **-0.264** | 0.155 | **-0.236** | 0.204 |
| Eligible*Income Threshold | **-0.237**** | 0.101 | **-0.317**** | 0.096 |
| Copay per income | **-0.329** | 0.371 | **-0.642** | 0.392 |
| Eligible*Copay per Income | **0.565**** | 0.150 | **0.505**** | 0.169 |

All variables described in EQ 4 in text are in the estimated models. The sample is composed of women are ages 18 to 45. Potentially eligible refers to women with children ages 0 to 12. ** $p<=.01$; *$p\leq.05$.

Among women with incomes below 70 percent of SMI, the pattern of results is identical to that using a cutoff of 85 percent of SMI. Higher expenditures are associated with a greater probability of employment and of being in the labor force among potentially eligible mothers, relative to ineligible women. Higher copays are associated with a higher probability of employment (an increase of 1.13 percent given a $1,500 increase in annual copayment) and of being in the labor force (an increase of 1.16 percent given a $1,500 increase in annual copayment) among potentially eligible mothers, relative to ineligible women. And higher income thresholds are associated with a lower probability of being in the labor force (a decrease of .77 percent given an increase in the income threshold equivalent to 10 percent of the dollar value of SMI ) – but not of employment – among potentially eligible mothers, relative to ineligible women.

Among women with incomes below 50 percent of SMI, the pattern of results is similar, but with one key difference: higher income eligibility thresholds resulted in not only lower labor force participation (1.16 percent decrease given an increase in the income threshold equivalent to 10 percent of the dollar value of SMI), but also lower employment (.89 percent decrease given an increase in the income threshold equivalent to 10 percent of the dollar value of SMI) among the potentially eligible mothers, relative to ineligible women. This contrasts to the analyses at 85 and 70 percent of SMI, where higher thresholds were associated with labor force participation, not with employment. This negative relationship between state income thresholds and employment for the lower income sample indicates that raising income thresholds results in worse employment outcomes for these women and, inversely, lowering those thresholds improves their outcomes.

Elasticities of employment and child care expenditures, and elasticities of labor force participation and child care expenditures, are shown in Table 6.

**Table 6. Elasticities of Employment and Labor Force Participation (for a percentage change in Child Care Expenditures)**

| Group | Employment | Labor Force Participation |
|---|---|---|
| Eligible women with children ages 0 to 12, 70% SMI | 0.047* | 0.050* |
| Eligible women with children ages 0 to 12, 50% SMI | 0.060* | 0.059* |

*statistically significant at $p<0.05$ based on the standard error of the coefficient. Elasticities are evaluated at the means of the target population using the marginal effect of the probit estimations.

## Job Search and Redetermination Periods

We estimated separate models for job search and length of redetermination because data from only a subset of years were available, from 2009 to 2012. The job search variable refers to whether or not the state allows initial eligibility for CCDF subsidies for people engaged in job search. The redetermination period variable refers to whether the redetermination period is 6 months or 12 months. We obtained these estimates from a model with a specification similar to that of Model 4 in Table 2 and for the same sample, and adding the job search and redetermination period variables. Results are shown in Table 7.

In these analyses none of the coefficients for these two variables are statistically significant at the $p<0.05$ level, nor are the point estimates on the difference-in-differences coefficients of substantive magnitude. These results suggest that permitting job search as an allowable activity for initial eligibility is not related to better employment outcomes of potentially eligible mothers. These results also indicate that a longer redetermination period does not improve the employment probability of potentially eligible mothers.

**Table 7. Estimates of the Effects of CCDF Job Search and Redetermination Period on Employment**

| | Employed | Standard error | In the Labor Force | Standard error |
|---|---|---|---|---|
| Job Search | **0.028** | 0.042 | **0.021** | 0.038 |
| Eligible*Job Search | **-0.017** | 0.023 | **-0.003** | 0.025 |
| Longer Determination | **-0.022** | 0.040 | **-0.001** | 0.032 |
| Eligible*Longer Determination | **0.001** | 0.021 | **-0.011** | 0.023 |
| N | 95,640 | | 95,519 | |

All the variables in EQ 4 in the text are included in these estimations. The sample is composed of women ages 18-45 and income up to 85% of SMI. Data years are 2009-2012. Potentially eligible refers to women with children ages 0-12.

# Discussion

The purpose of this study was to investigate the effects of CCDF expenditures and policy on the employment outcomes of women likely to be eligible for CCDF subsidies. The results have implications for federal policies designed to support the employment of low-income mothers. This study adds to the literature by using a quasi-experimental approach to estimate the impact of CCDF funding across the United States, as well as by examining a broader set of policy parameters than other studies do (e.g., income eligibility thresholds, job search, redetermination periods), and estimating impacts on a variety of demographic and income subgroups.

Using a difference-in-differences approach to identify CCDF effects allowed us to compare the differential effects of changes in CCDF funding and policies on potentially eligible mothers relative to ineligible women. Using micro-level data from the Current Population Survey for years 2003 to 2012, we found that higher CCDF expenditures are associated with higher employment chances for potentially eligible mothers. This finding is robust across different subgroups of mothers and using different income cutoffs, and the elasticities obtained from these models are comparable to those obtained in the literature. CCDF expenditures comprise most but not all child care expenditures available to lower income women, but it is the best available measure of expenditures by state and across time. Expenditures on child care through TANF, the other large source of child care subsidies for low-income women, have been stalled or declining[21].

Income thresholds and copayments also had effects on employment outcomes. We found that when income thresholds decrease, the probability of labor force participation increased among potentially eligible mothers, and this was true whether the income cut-off used to define the analytic sample was 85, 70, or 50 percent of SMI. Employment also increased among potentially eligible mothers, but only when the income cut-off used was 50 percent of SMI. This suggests that lower income thresholds allow states to target funds on the poorest women most in need of employment support. Also unexpectedly, we found that lower copayment rates were associated with decreasing probability of employment. Given a fixed amount of funds, higher copayments may allow the program to serve more women, thus possibly increasing the chances of employment. It is also possible that states are using these parameters for rationing child care subsidies because demand for subsidies is almost always larger than the supply of available funds.

There is little research with which to compare our findings on copayments and income thresholds. Michalopoulus (2010) and Michalopoulos, Lundquist & Castells (2010), using an experimental design, reported no effect of these variables on employment. The authors argued that this was possibly due to the fact that most women in their study were already working and had relatively high earnings. Additional research is needed to determine the effects of income threshold and copayments on employment, particularly for low-income and unemployed women.

Finally, we found that mothers' probability of employment was not related to either permitting job search as an allowable activity for initial eligibility or length of the redetermination period. With respect to job search, perhaps even if women were eligible in their state for child care to help them conduct a job search,

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[21] Schott, Pavetti, & Finch, 2012

given limited funding, very few of these eligible women actually receive subsidies. And with respect to length of the redetermination period, perhaps redetermination periods only affect individuals already receiving subsidies, who are likely already employed. On the other hand, these results should be interpreted with caution: if more funding were to be made available allowing more eligible women to receive subsidies, these same parameters could turn out to have employment effects.

There are limitations to this study. First, as described previously, the measure of expenditures excluded TANF and SSBG funds, which states can use to provide additional child care subsidies. A second limitation is that our sample includes families whom, if the mother were to work, would be no longer income-eligible for subsidies. Consider for example a two-parent family where only the father is employed and the father's income alone brings the family's income to 80 percent of SMI. This family would be considered "potentially eligible" in our analysis. However, if the mother were to become employed, the family would almost certainly be above 85 percent of SMI and thus become income-ineligible for child care subsidies.

A third limitation of this analysis is that our assessment of potential eligibility does not account for all of the detailed rules governing real-world state-level eligibility, such as certain types of income and state-specific definitions of the family unit. However, given the robustness of results using different income cut-offs, we expect that the results would likely be very similar using actual state-level definitions of eligibility.

A fourth limitation is that this analysis is limited to mothers, although households with no mothers (e.g., those headed by grandmothers) are also eligible for child care subsidies.

Despite these limitations, these findings have important implications for child care policies and employment policies in general. In particular, they suggest that increasing expenditures on subsidized child care could increase employment among low-income mothers. Furthermore, the findings suggest that child care should be considered as one approach in proposals designed to increase employment and labor force participation.

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# Appendices:  Full Models from Table 4

**Appendix Table 1. Estimated Effects of CCDF Variables on Employment Outcomes, Model 1 from Table 4 Model**

|  | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| Married | 0.300 | 0.014 | 0.349 | 0.013 |
| Age | 0.137 | 0.006 | 0.133 | 0.007 |
| Age$^2$ | -0.002 | 0.000 | -0.002 | 0.000 |
| No HS Diploma | -0.475 | 0.025 | -0.417 | 0.027 |
| Black | 0.077 | 0.045 | 0.181 | 0.039 |
| Latino | 0.137 | 0.032 | 0.150 | 0.028 |
| White | 0.186 | 0.041 | 0.169 | 0.035 |
| Foreign Born | -0.107 | 0.025 | -0.169 | 0.023 |
| Eligible (Has children 0 to 12) | -0.253 | 0.061 | -0.209 | 0.059 |
| Expenditure per pop 0 to 12 ($000) | -0.277 | 0.155 | -0.282 | 0.154 |
| Expenditure per pop 0 to 12 *Eligible | 0.370 | 0.147 | 0.441 | 0.180 |
| Income Eligibility Threshold/SMI | -0.106 | 0.070 | 0.025 | 0.102 |
| Income Eligibility Threshold/SMI*Eligible | -0.150 | 0.080 | -0.214 | 0.078 |
| Copay fam of 3/$15,000 | -0.296 | 0.116 | -0.367 | 0.104 |
| Copay fam of 3/$15,000*Eligibility | 0.347 | 0.141 | 0.340 | 0.145 |
| Unemployment Rate | -0.014 | 0.003 | 0.006 | 0.003 |
| Year | -0.010 | 0.003 | -0.009 | 0.002 |
| *N* | 238,030 | | 237,783 | |
| *Prob > chi2* | 0 | | 0 | |
| *Pseudo R2* | 0.063 | | 0.063 | |

Note: Model includes state fixed effects.

**Appendix Table 2. Estimated Effects of CCDF Variables on Employment Outcomes, Model 2 from Table 4**

| | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| Married | 0.300 | 0.014 | 0.349 | 0.013 |
| Age | 0.137 | 0.006 | 0.133 | 0.007 |
| Age$^2$ | -0.002 | 0.000 | -0.002 | 0.000 |
| No HS Diploma | -0.475 | 0.025 | -0.417 | 0.027 |
| Black | 0.077 | 0.045 | 0.181 | 0.039 |
| Latino | 0.137 | 0.032 | 0.150 | 0.028 |
| White | 0.186 | 0.041 | 0.169 | 0.035 |
| Foreign Born | -0.106 | 0.025 | -0.169 | 0.023 |
| Eligible (Has children 0 to 12) | -0.252 | 0.061 | -0.208 | 0.059 |
| Expenditure per pop 0 to 12 ($000) | -0.302 | 0.150 | -0.320 | 0.140 |
| Expenditure per pop 0 to 12 ($000)*Eligible | 0.370 | 0.147 | 0.442 | 0.180 |
| Income Eligibility Threshold/SMI | -0.045 | 0.072 | 0.119 | 0.093 |
| Income Eligibility Threshold/SMI*Eligible | -0.152 | 0.080 | -0.217 | 0.079 |
| Copay fam of 3/$15,000 | -0.298 | 0.112 | -0.370 | 0.104 |
| Copay fam of 3/$15,000*Eligibility | 0.346 | 0.141 | 0.339 | 0.145 |
| SMI | 0.000 | 0.000 | 0.000 | 0.000 |
| Unemployment Rate | -0.016 | 0.003 | 0.003 | 0.003 |
| Year | -0.017 | 0.003 | | |
| *N* | 238,030 | | 237,783 | |
| *Prob > chi2* | 0 | | 0 | |
| *Pseudo R2* | 0.0631 | | 0.063 | |

Note: Model includes state fixed effects.

**Appendix Table 3. Estimated Effects of CCDF Variables on Employment Outcomes, Model 3 from Table 4**

| Right-hand side variables | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| Married | 0.300 | 0.014 | .348 | 0.013 |
| Age | 0.137 | 0.006 | 0.132 | 0.006 |
| Age$^2$ | -0.002 | 0.000 | -0.001 | 0.000 |
| No HS Diploma | -0.475 | 0.025 | -0.417 | 0.027 |
| Black | 0.077 | 0.045 | 0.181 | 0.038 |
| Latino | 0.137 | 0.032 | 0.150 | 0.028 |
| White | 0.186 | 0.041 | 0.168 | 0.035 |
| Foreign Born | -0.106 | 0.025 | -0.168 | 0.023 |
| Eligible (Has children 0 to 12) | -0.254 | 0.061 | -0.209 | 0.058 |
| Expenditure per pop 0 to 12 ($000) | 0.072 | 0.285 | -0.320 | 0.302 |
| Expenditure per pop 0 to 12*Eligible | 0.370 | 0.146 | 0.440 | 0.179 |
| Income Eligibility Threshold/SMI | -0.216 | 0.105 | -0.170 | 0.154 |
| Income Eligibility Threshold/SMI*Eligible | -0.148 | 0.080 | -0.213 | 0.078 |
| Copay fam of 3/$15,000 | -0.048 | 0.253 | -0.299 | 0.290 |
| Copay fam of 3/$15,000*Eligibility | 0.348 | 0.142 | 0.339 | 0.145 |
| Unemployment Rate | -0.014 | 0.011 | -0.013 | 0.015 |
| Unemployment Rate*Expenditure per pop 0 to 12 ($000) | -0.041 | 0.035 | 0.018 | 0.038 |
| Unemployment Rate*Income Eligibility Threshold/SMI | 0.015 | 0.013 | 0.030 | 0.018 |
| Unemployment Rate*Copay fam of 3/$15,000 | -0.044 | 0.046 | -0.012 | 0.041 |
| Year | -0.010 | 0.003 | -0.009 | 0.002 |
| *N* | 238,030 | | 237,783 | |
| *Prob > chi2* | 0 | | 0 | |
| *Pseudo R2* | 0.0631 | | 0.0630 | |

Note: Model includes state fixed effects.

**Appendix Table 4. Estimated Effects of CCDF Variables on Employment Outcomes, Model 4 from Table 4**

| Right-hand side variables | **Employed** | Standard error | **In Labor Force** | Standard error |
|---|---|---|---|---|
| Married | 0.300 | 0.014 | 0.349 | 0.013 |
| Age | 0.137 | 0.006 | 0.133 | 0.007 |
| Age*Age | -0.002 | 0.000 | -0.002 | 0.000 |
| No HS Diploma | -0.475 | 0.025 | -0.417 | 0.027 |
| Black | 0.077 | 0.045 | 0.181 | 0.039 |
| Latino | 0.137 | 0.032 | 0.150 | 0.028 |
| White | 0.186 | 0.041 | 0.169 | 0.035 |
| Foreign Born | -0.106 | 0.025 | -0.168 | 0.023 |
| Eligible (Has children 0 to 12) | -0.253 | 0.061 | -0.208 | 0.059 |
| Expenditure per pop 0 to 12 ($000) | 0.131 | 0.282 | -0.233 | 0.299 |
| Expenditure per pop 0 to 12 ($000)*Eligible | 0.370 | 0.146 | 0.441 | 0.179 |
| Income Eligibility Threshold/SMI | -0.139 | 0.109 | -0.057 | 0.150 |
| Income Eligibility Threshold/SMI*Eligible | -0.150 | 0.080 | -0.216 | 0.079 |
| Copay fam of 3/$15,000 | -0.126 | 0.275 | -0.411 | 0.308 |
| Copay fam of 3/$15,000*Eligibility | 0.347 | 0.141 | 0.338 | 0.146 |
| SMI | 0.000 | 0.000 | 0.000 | 0.000 |
| Unemployment Rate | -0.012 | 0.011 | -0.012 | 0.014 |
| Unemployment Rate*Expenditure per pop 0 to 12 ($000) | -0.057 | 0.035 | -0.004 | 0.041 |
| Unemployment Rate*Income Eligibility Threshold/SMI | 0.013 | 0.012 | 0.027 | 0.017 |
| Unemployment Rate*Copay fam of 3/$15,000 | -0.032 | 0.048 | 0.006 | 0.043 |
| Year | -0.017 | 0.003 | -0.020 | 0.003 |
| *N* | 238,030 | | 237,783 | |
| *Prob > chi2* | 0 | | 0 | |
| *Pseudo R2* | 0.0631 | | 0.0631 | |

Note: Model includes state fixed effects.