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Market Outcomes: Evidence from the
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ABSTRACT

The Effects of Child Care Subsidies on Paid Child Care Participation and Labor Market Outcomes: Evidence from the Child and Dependent Care Credit*

The Child and Dependent Care Credit (CDCC), a tax credit based on income and child care expenses, reduces child care costs for working families. The Economic Growth and Tax Relief Reconciliation Act expanded the CDCC in 2003, generating differential increases in generosity across states and family sizes. Using data from the March Current Population Survey, the author finds that a \$100 increase in CDCC generosity increases paid child care participation by 0.6 percentage points among single mothers and 2.2 percentage points among married mothers with children younger than 13 years old. The author also finds that CDCC benefits increase labor supply among married mothers, who may experience long-run earnings gains.

JEL Classification: J13, H24, J22, H71

Keywords: child care subsidies, paid child care participation, female labor supply

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Child care in the United States is expensive. As of 2018, median child care prices for one child ranged from 8–19 percent of median family income, depending on child age, provider type, and location (Landivar, Graf, and Rayo 2023). Child care costs matter because high costs may induce parents to exit the labor market or to place their children in lower-quality child care arrangements (Kuziemko, Pan, Shen, and Washington 2018). Existing research shows that substitution into higher-quality child care arrangements accelerates children’s human capital development (Cunha and Heckman 2007; Havnes and Mogstad 2011; Cornelissen, Dustmann, Raute, and Schönberg 2018) and that parents who remain in the labor market may experience long-run earnings gains (Angelov, Johansson, and Lindahl 2016; Kleven et al. 2019; Kleven, Landais, and Sogaard 2019; Kleven, Landais, and Leite-Mariante 2023). In light of this, many policymakers have advocated for measures to decrease child care costs within the United States.

Currently, the Child and Dependent Care Credit (CDCC) subsidizes child care costs for working families. The CDCC, a tax credit based on taxpayers’ income and child care expenses, is “designed to help families pay employment-related expenses for care of a child” (Gitterman and Howard 2003, p.19). The nonrefundable federal CDCC is available in all states to working families with children younger than 13 years old, and nearly half of states supplement the federal credit with their own refundable or nonrefundable state child care credits. In this paper, I use variation in CDCC generosity over time and across states and family sizes to estimate the effects of child care subsidies on family outcomes.

Figure 1 shows that the Economic Growth and Tax Relief Reconciliation Act, which was a part of the Bush tax cuts, expanded the federal CDCC in 2003 and led to large increases in federal CDCC expenditures. These expenditures increased from \$2.7 billion in 2002 to \$3.2 billion in 2003 and continued to increase to over \$3.6 billion by 2016. The 2003 expansion increased CDCC benefits differentially across states and family sizes because states calculate their CDCC benefits

as a percent of federal CDCC benefits. Additionally, taxpayers with two or more children were eligible for larger benefit amounts than taxpayers with only one child.

In this paper, I estimate effects of CDCC benefits on mothers' paid child care participation and labor market outcomes. Because CDCC benefits likely are correlated with unobservable characteristics of taxpayers that affect both benefits and outcomes, as well as behavioral responses to changes in the tax code, identification comes from differential increases in generosity under the Bush tax cuts.

Contribution to the Literature

While there is extensive work on the effects of child care subsidies in Europe and Canada,¹ including evidence that child care subsidies increase paid child care participation (Baker, Gruber, and Milligan 2008; Givord and Marbot 2015), there is limited research on the effects of child care subsidies within the United States.² Effects of child care subsidies likely differ across countries because of differences in policy contexts. For instance, child care subsidies in Europe and Canada tend to be much more generous than the CDCC. If fixed costs of paid child care use prevent participation within the United States, then responses to increased CDCC generosity may be relatively small, especially among low-income parents who do not benefit from the nonrefundable federal credit. Additionally, existing evidence suggests that labor supply responses to child care subsidies largely depend on female labor supply at baseline, which varies dramatically across countries.

I am the first to estimate short-run effects of the CDCC on labor supply. My work

¹ See Baker, Gruber, and Milligan (2008), Bettendorf, Jongen, and Muller (2015), Cornelissen et al. (2018), Givord and Marbot (2015), Havnes et al. (2011), Lefebvre and Merrigan (2008), Lefebvre, Merrigan, and Verstraete (2009), and Lundin, Mörk, and Öckert (2008).

² Tekin (2005, 2007) estimates the effects of child care subsidies for very-low-income parents through the Aid to Families with Dependent Children and Temporary Assistance for Needy Families programs.

contributes to the literature on the CDCC and policies to increase parents' access to child care and labor supply more broadly.³ My study of effects on paid child care use builds upon Miller and Mumford (2015), who use the federal CDCC expansion and data from the Consumer Expenditure Survey to estimate the effects of CDCC benefits on child care expenditures. The authors find large elasticities of child care expenditures but do not account for cross-state variation in CDCC generosity and rely on the assumption that households' average child care spending would have remained constant between 2000–2002 and 2003–2005 absent the federal CDCC expansion. By leveraging variation in CDCC generosity across states and using measures of benefit generosity that are purged of individual characteristics, I isolate behavioral effects of tax policy changes from secular trends in taxpayers' behavior. Additionally, attributing responses to increases in both state and federal credits to increases in the federal credit alone, as was done in prior work, likely leads to overestimates of effects of the federal CDCC. My estimates account for state CDCCs, for which generosity ranges from 20–110 percent of the federal credit.

My work also is related to that of Guner, Kaygusuz, and Ventura (2020), who estimate the effects of transfer programs for families, including the CDCC, using life-cycle models of fertility, labor supply, and child care. They rely on assumptions related to households' life-cycle dynamics, number of children, child care costs, and utility costs of work to find that expanding the CDCC would increase labor force participation among married women. My empirical strategy allows me to identify short-run effects of the CDCC under less stringent assumptions.

Institutional Details and CDCC Eligibility and Expenditures

³ See Altshuler and Schwartz (1996), Averett, Peters, and Waldman (1997), Gentry (1996), and Michalopoulos, Robins, and Garfinkel (1992) for literature on the CDCC before the 2003 expansion, Rodgers (2018, 2023) for work on the tax incidence of the CDCC, and Pepin (2022) and Pepin and Truskinovsky (2023) for simulations of possible CDCC expansions.

As shown in Table 1, from 1982 until 2003, taxpayers could receive up to \$720 per calendar year in CDCC benefits per child younger than age 13 for up to two children. More specifically, taxpayers could claim up to \$2,400 of child care expenditures per child and would receive a nonrefundable credit worth up to 30 percent of those expenses. All CDCC claimants had to be working to qualify for benefits, including both spouses among taxpayers married filing jointly, although benefits generally did not depend on filing status.⁴ Additionally, if either spouse's earnings were less than child care expenditures, then the CDCC was calculated as a percent of the lesser of the two taxpayers' earnings. Eligible child care expenditures included spending on child care provided by anyone but the taxpayer's spouse or dependent or the child's parent. To claim the credit, taxpayers had to list their earnings, child care expenditures, and child care providers' tax identification or Social Security numbers on federal Form 2441. Benefits decreased taxes due during the following calendar year.

The CDCC was not indexed to inflation, and its real value decreased substantially over time. Then, in 2001, as part of the Bush tax cuts, a broad set of initiatives that lowered taxes for many families with moderate to high incomes, Congress increased the CDCC expense limit and rate schedule. These changes took effect in 2003. Table 1 shows that beginning in 2003, taxpayers could claim up to \$3,000 in child care expenses per child for up to two children and receive a nonrefundable tax credit worth up to 35 percent of those expenses, or \$1,050. The benefit rate decreased by one percentage point for each additional \$2,000 in adjusted gross income (AGI) above \$15,000 until it remained at 20 percent for those with \$43,000 or more in AGI, who could receive up to \$600 in federal CDCC benefits.

Both before and after the federal CDCC expansion in 2003, the nonrefundability of the

⁴ Taxpayers married filing separately are ineligible for CDCC benefits.

federal CDCC generated a difference between statutory and effective, or actual, CDCC benefits received. I therefore use tax filing thresholds, AGI levels at which taxpayers begin to have positive tax liability, to graph effective federal CDCC benefit schedules for taxpayers with the maximum child care expenditures before and after the federal CDCC expansion in Figure 2.⁵ The lines graph the effective tax schedules for taxpayers with one child younger than 13 years old as of 2002 (solid orange line), two or more children as of 2002 (dashed purple line), one child as of 2003 (dotted red line), and two or more children as of 2003 (dash-dotted blue line).

As expected, the nonrefundability of the federal CDCC implies that taxpayers with incomes below the tax filing thresholds are ineligible for CDCC benefits. Taxpayers with one child and two or more children must have incomes around \$13,000 and \$16,000 or more, respectively, to be eligible for CDCC benefits both before and after the federal expansion. In 2002, effective CDCC benefits increase with income for taxpayers with one child before reaching a peak of about \$600 for taxpayers with approximately \$19,000 in income. This is well below the statutory maximum of \$720 shown in Table 1. Effective benefits then decrease until they reach \$480 for taxpayers with \$30,000 in income.

After the federal expansion, the effective CDCC phase-in region extends so that benefits reach a peak of about \$940 for taxpayers with \$22,500 in income. Again, the nonrefundability of the federal CDCC generates a difference between maximum statutory benefits, or \$1,050, and maximum effective benefits. Post-expansion effective CDCC benefits also decrease over a larger range of incomes before remaining constant at \$600 for taxpayers with \$43,000 or more in income. Hence, among taxpayers with one child younger than age 13, the federal CDCC expansion creates longer effective CDCC phase-in and phase-out regions while weakly increasing CDCC generosity

⁵ Effective federal CDCC benefit schedules for taxpayers with lower child care expenditure levels are less generous but otherwise similar.

at all income levels.⁶ Taxpayers with two or more children younger than age 13 face more generous but otherwise similar effective CDCC schedules.⁷

In addition to the federal credit, as of 2002, taxpayers in 21 states and the District of Columbia could receive additional CDCC benefits through state supplements. In the appendix, I document that statutory maximum benefits vary considerably across states, ranging from \$288 in Arkansas and Kentucky to \$1,920 in Oregon. I also show that nine states (and the District of Columbia) offer refundable CDCCs so that statutory benefits equal effective benefits. In addition to refundability, eight states make their CDCCs progressive by limiting benefits to taxpayers with AGI below a certain threshold.

The federal CDCC expansion increased CDCC generosity differentially across states due to differences in preexisting credit formulas, as states calculate their benefits as a percent of the federal credit or the child care expenses used to calculate it. These differences in preexisting state credit formulas led to considerable differences in benefit increases when the federal CDCC expanded. For example, Oregon's effective maximum CDCC increased from \$1,440 in 2002 to \$2,100 in 2003. Meanwhile, maximum effective state benefits increased from \$288 to \$420 in Kentucky.⁸

Data

⁶ For some income levels, the federal CDCC expansion decreases maximum CDCC benefits by up to \$25.

⁷ Both before and after the federal CDCC expansion, the CDCC has interacted with other elements of the tax code, such as the Child Tax Credit, which also expanded in 2003, in a complicated way. Fortunately, unlike the CDCC, the Child Tax Credit expansion led to the same change in benefits for households in all states, conditional on income and number of children younger than 17. Analyses in which I do not control for households' number of children younger than 17, among other individual-level characteristics, can be found in the appendix. Results are very similar to those in the main analyses, which suggests that changes to the Child Tax Credit do not drive results. Additional details regarding interactions between the CDCC and other elements of the tax code can be found in the appendix.

⁸ California and Maine decreased and Vermont increased its CDCC generosity relative to that of the federal credit in 2003. Louisiana also implemented a CDCC for the first time in 2003. Results are robust to dropping these states from the analyses and can be found in the appendix. Moreover, as of 2002, Hawaii, Minnesota, and New Mexico had maximum CDCC levels, which limited the amounts by which their maximum CDCCs could increase between 2002 and 2003. Additionally, some states offered larger CDCC benefit rates to lower-income taxpayers, which led to larger increases in CDCC benefits for such households.

I use the 2001–2009 March Current Population Survey (CPS) to study CDCC benefits, paid child care participation, and labor market outcomes.⁹ The March CPS is an annual state-representative survey of nearly 100,000 households. The data document individuals’ demographics and labor market outcomes, including employment, hours worked per week, and income from various sources during the previous calendar year. The main advantages of the March CPS are its large sample size and detailed information on labor market outcomes. Unfortunately, the March CPS does not contain extensive data on child care choices; I only observe whether households report using paid child care services on an annual basis.

Because I do not observe expenditures in the March CPS data, I also use data from the Survey of Income and Program Participation (SIPP) Child Care Topical Module that was administered in 2002. The SIPP is a nationally representative survey of over 40,000 households; the Child Care Topical Module documents individuals’ demographics and child care expenditures. Table 2 displays average child care expenditures from the SIPP, conditional on paid child care participation, by marital status, number of children, the presence of a child younger than age six in the household, and whether the mother has a college degree.¹⁰ There are 1,320 households in the sample, and child care expenditures vary considerably across demographic groups. Annual child care expenditures range from less than \$2,000 among married households with only one child younger than 13 years old and no children younger than six years old in which the mother does not have a college degree to over \$9,000 among college-educated single parents with two or more children younger than age 13 and at least one child younger than age six. Nearly all demographic groups spend over \$3,000 per year on child care, conditional on participation, and expenditures tend to increase with educational attainment, number of children, and the presence of

⁹ Information on paid child care participation was first elicited in the 2001 survey.

¹⁰ If there is no mother in the household, I use the father’s educational attainment.

young children in the household.

I impute child care expenditures for each household in the March CPS using the SIPP Child Care Topical Module data. For a given CPS respondent who reported that their household did not pay for child care during a given tax year, I impute \$0 in child care expenditures. For another CPS respondent who reported that their household did pay for child care, I impute the inflation-adjusted average child care expenditure amount among SIPP respondents who paid for child care in the same demographic group by marital status, number of children, child age, and education level using sample weights.¹¹

After imputing demographic groups' expenditure amounts and assigning them to March CPS respondents, I simulate households' CDCC benefits using the National Bureau of Economic Research's TAXSIM program, which estimates individuals' tax liabilities, marginal tax rates, and tax credits, including their state and federal CDCC benefits.¹² I assume that eligible families claim all child care spending, regardless of mode of care. Given nontrivial informal child care participation rates reported in the SIPP, I likely overestimate CDCC benefits. In this case, effects of simulated CDCC benefits are a lower bound on effects of actual CDCC benefits received.

To isolate the population most affected by child care subsidies, I limit the sample to mothers aged 18–54 in households with children younger than 13 years old in the main analyses.¹³ There are nearly 200,000 mothers in this sample. Table 3 displays pre-CDCC expansion summary

¹¹ SIPP respondents report child care expenditures during the past month. I multiply monthly expenditures by 12 to compute annual expenditures. In additional analyses, I regress child care expenditures on individual demographic information using the sample of SIPP respondents who paid for child care. I then use the coefficient estimates from these regressions to estimate an imputed child care expenditure amount for each CPS respondent who reported paid child care participation. Results using this procedure are similar to those in which I impute child care expenditures using average expenditure amounts and are available upon request.

¹² I assume that households tax-minimize. Evidence from Jones (2014), who documents that over 77 percent of taxpayers eligible for the Earned Income Tax Credit took up that credit as of 2005, suggests that families with children tax-minimize. Nonetheless, households that use informal child care arrangements in particular may be reluctant to claim CDCC benefits, which requires listing child care providers' Social Security numbers on their tax forms. Additionally, I assume that married taxpayers file as married, filing jointly and that single taxpayers file as head-of-household. I assume that all of the household's dividends are nonqualified; the household does not have capital gains; and effects of rent paid, property taxes, and mortgage interest on CDCC benefits are negligible.

¹³ I drop mothers who report receipt of child care subsidies through the Child Care and Dependent Fund program. This decreases the sample size by two percent. Results are robust to including these mothers in the sample.

statistics from the 2001–2003 surveys by marital status. Pre-expansion single and married mothers are 32 and 35 years old on average, respectively. Both single and married mothers average about two children younger than 17 years old, though married mothers tend to have more children under six (0.80 vs. 0.65). Some 25 percent of single mothers and 23 percent of married mothers pay for child care, which suggests that CDCC policies may affect a large proportion of the sample. Education levels and labor market outcomes differ considerably by marital status. While 32 percent of married mothers have college degrees, only 12 percent of single mothers are college educated. Despite their high education levels, married mothers exhibit relatively low levels of labor force attachment. Some 71 percent of married mothers worked for pay during the previous calendar year, working 25 hours per week on average. Meanwhile, 79 percent of single mothers were employed, averaging 30 hours of work per week. Nonetheless, unconditional average earnings were slightly higher among married mothers (\$19,695 vs. \$18,126 in 2000 dollars), perhaps due to their higher education levels. Single and married mothers' unconditional annual CDCC benefits averaged \$129 and \$151 (2000 dollars), respectively, before the federal expansion. Conditional on eligibility, average benefits were \$678 for single and \$716 for married mothers.

There are statistically significant differences between single and married mothers for all outcomes listed in Table 3. As noted above, many of these differences are economically significant as well. I therefore consider single and married mothers separately throughout the analyses.

Conceptual Framework of CDCC Incentives

In this section, I consider how the 2003 federal CDCC expansion theoretically affects taxpayers' behavior. First, as a subsidy for child care expenditures, increases in CDCC generosity encourage household members to substitute away from unpaid care in favor of paid care services. Among

households already paying for child care, increases in benefits promote additional care hours and more expensive care services. Moreover, because all primary taxpayers and spouses must work to receive benefits, the CDCC encourages parents' labor force participation, which may require additional child care use.

The federal CDCC's intensive margin labor supply incentives are more complex, and, as shown in Figure 2, the 2003 expansion created different phase-in, phase-out, and plateau regions of the credit. Households with one eligible dependent and about \$19,000 to \$22,500 in income before the expansion experience positive income and substitution effects, so their intensive margin labor supply response is theoretically ambiguous. Similar households with \$22,500 to \$43,000 in income experience a positive income and a negative substitution effect and, therefore, should decrease their intensive margin labor supply. Taxpayers with higher incomes only experience a positive income effect and also should decrease their intensive margin labor supply. Intensive margin labor supply incentives do not change for taxpayers with incomes below \$19,000, who do not experience increases in benefits. The 2003 federal CDCC expansion generates a similar pattern of incentives for households with two or more eligible dependents.

In light of its expected effects on paid child care use and extensive and intensive margin labor supply, I empirically estimate effects of the 2003 federal CDCC expansion on paid child care participation and labor supply in the following sections.

Paid Child Care Participation

Empirical Strategy

I estimate the following model of child care subsidies and paid child care participation separately

across single and married mothers using the March CPS data:

$$(1) \quad Y_{igst} = \beta CDCC_{igst} + \alpha_g + \alpha_s + \alpha_t + \rho_{st}\Omega + X_{igst}\Gamma + \varepsilon_{igst},$$

where Y_{igst} is an indicator for annual paid child care participation for household i in demographic group g in state s during year t . The key independent variable, $CDCC_{igst}$, represents \$100 in CDCC benefits (2000 dollars) for taxpayer i in demographic group g in state s during year t , which I calculate using the procedure documented in the Data section. The demographic groups are defined by number of children younger than age 13, the presence of a child younger than age six, and whether the mother has a college education. α_g , α_s , and α_t are demographic group, state, and year fixed effects, respectively. ρ_{st} denotes state characteristics, including the unemployment rate (U.S. Bureau of Labor Statistics 2022), the log of the inflation-adjusted minimum wage (Office of Communication, Wage and Hour Division, U.S. Department of Labor 2023), and an indicator for universal preschool availability (Jordan and Grossmann 2021). X_{igst} denotes individual characteristics, such as age, race, and number of children younger than 17 years old, and ε_{igst} is the error term. I cluster standard errors at the state level. β is the coefficient of interest and represents the effect of a \$100 increase in CDCC benefits on paid child care use.¹⁴

Estimates of Equation (1) likely are inconsistent, however. For example, one can expect a spurious correlation between paid child care participation and CDCC benefits, as income likely affects both child care choices and CDCC benefits. Additionally, changes in tax policy may lead to changes in taxpayers' behavior that are correlated with CDCC benefits. For instance, increased CDCC generosity may increase both paid child care participation and CDCC benefits. Hence, I

¹⁴ A \$100 increase in benefits represents a typical benefit increase under the federal CDCC expansion. Average conditional benefits increased by \$137 and \$110 among single and married mothers, respectively, between 2002 and 2003.

estimate Equation (1) using a “simulated” measure of CDCC generosity in place of $CDCC_{igst}$.

To construct the simulated CDCC benefit measure, I start with the subsample of mothers who reported income and paid child care participation for tax year 2002, before the federal CDCC expansion. I then replicate this subsample of mothers for each tax year from 2000 through 2008. After converting income and expenditure values into current year dollars, I use TAXSIM to estimate a CDCC benefit for each replicated mother, had they existed in the current tax year, using the procedure documented in the Data section. I then scale by 100 so that β represents a \$100 increase in the benefit measure. Using the same group of taxpayers from before the federal CDCC expansion allows me to estimate what CDCC benefit amounts would have been if expenditures and labor supply did not change as a result of the expansion.

Next, I take averages of mothers’ CDCCs across states, years, and demographic groups, defined by marital status, number of children, child age, and education, using sample weights. Averaging benefit measures by state of residence, year, and household characteristics leads to simulated CDCC benefit measures that are parsed of pre-expansion households’ endogenous child care expenditure amounts. Thus, the simulated CDCC benefit measures summarize changes in tax policy but not individual-level omitted variables that are correlated with both CDCC benefits and outcomes or behavioral responses to changes in the tax code. As a result, identification comes from the federal CDCC expansion and the differential changes in CDCC generosity that it generated due to baseline differences in benefits by family size, state, and pre-expansion child care spending levels.

To examine the relative importance of the various sources of variation, I regress the simulated CDCC benefit measure separately on the state, year and demographic group fixed effects included in Equation (1) and list the R^2 ’s from these regressions in the appendix. When considered separately, demographic group and state of residence account for the most variation

in simulated CDCC benefits with R^2 's of 0.361 and 0.168, respectively. This is unsurprising, given large baseline differences in CDCC generosity across states and in child care spending across demographic groups. The regression of the simulated CDCC benefit measure on year fixed effects yields an R^2 of 0.006. In the following subsection, I rely on variation in CDCC generosity across states and demographic groups over time to estimate effects of benefits on paid child care participation.

Results

Table 4 presents estimates of the effects of CDCC generosity on annual paid child care participation across single and married mothers.¹⁵ The estimate for single mothers, 0.006, is significant at the 10 percent level and suggests that a \$100 increase in CDCC generosity increases annual paid child care use by 0.6 percentage points, or 2.4 percent. The statistically significant effect among married mothers, 0.022, is considerably larger, and suggests that a \$100 increase in CDCC generosity increases paid child care use by 2.2 percentage points, or 9.6 percent. While this estimate may seem large, the confidence interval includes estimates as small as 0.014, which implies an effect size of 6.1 percent. Estimates across both single and married mothers suggest dramatic increases in paid child care participation, which corroborates evidence from Miller et al. (2015), who find that child care expenditures increased in response to the federal CDCC expansion.

Robustness

¹⁵ Estimated effects of CDCC generosity on paid child care participation for single fathers and labor market outcomes for both single and married fathers are small and statistically insignificant and can be found in the appendix.

I test the robustness of results to various sample restrictions and alternative specifications and include results in the appendix. First, I estimate specifications in which I remove California, Louisiana, Maine, and Vermont, which changed their CDCC policies between 2002 and 2003, from the analyses. Results from these specifications are similar to those in the main analyses. Effects among single mothers (coefficient of 0.007, SE = 0.0029) and married households (coefficient of 0.023, SE = 0.0042) are statistically significant and nearly identical to those in Table 4, which suggests that changes in CDCC policies in California, Louisiana, Maine, and Vermont do not drive results.

I also estimate specifications in which I do not include any state- or individual-level controls. Estimates from these models suggest that controls play a limited role in determining the coefficients of interest, as estimates are very close to those from the main analyses. As in Table 4, the estimate for single mothers (coefficient of 0.005, SE = 0.0030) is significant at the 10 percent level, and the estimate for married mothers (coefficient of 0.023, SE = 0.0041) is significant at the 1 percent level. Both point estimates are quite similar to those in Table 4.

In addition, states with more generous CDCC benefits at baseline may have been experiencing differential increases in demand for paid child care use before the federal CDCC expansion, which could drive results. To account for the possibility of differential trends in child care demand across states that are unrelated to CDCC policies, I estimate specifications in which I include state-specific linear time trends. Including such trends in the model leaves estimates among single mothers (coefficient of 0.005, SE = 0.0029) and married mothers (coefficient of 0.022, SE = 0.0041) virtually unchanged, so differential trends in child care demand do not seem to drive results.

Another potential concern is that households do not respond to CDCC benefits as of the current tax year because they do not receive benefits until the following spring when they file their taxes. I use the longitudinal nature of the CPS to investigate this possibility. Specifically, I restrict the

sample to households that I observe twice and estimate effects of CDCC benefits as of the previous tax year. This sample restriction reduces sample size considerably and increases standard errors. The effect among single mothers (coefficient of -0.005, SE = 0.0090) is negative but statistically insignificant. The estimate for married mothers (coefficient of 0.031, SE = 0.0062), however, is statistically significant and larger than that in Table 4, which suggests that taxpayers may be more apt to respond to the previous year's CDCC benefits than to the current year's benefits.

Malik et al. (2018) provide evidence that the number of licensed child care providers per young child varies considerably across geographic areas. Specifically, the authors find that rural areas have fewer child care providers per child than urban areas. In light of this, it is possible that in urban areas, it is easier for parents to substitute away from parental care or unpaid informal child care arrangements into paid child care, especially if licensed child care provision is relatively elastic in areas with many child care centers. To address this, I estimate models by households' metropolitan status. Across both single and married mothers, effects across metropolitan and nonmetropolitan areas are similar and are not statistically different from one another. Additionally, I use data from the Quarterly Census of Employment and Wages to graph changes in average simulated CDCC benefits and numbers of child care centers and workers across states between 2000–2002 and 2003–2005 in the appendix. I do not find evidence that changes in child care supply, as proxied by changes in the numbers of child care centers and workers, are correlated with changes in simulated CDCC benefits. The lack of evidence of a supply response to increased demand for paid child care is in line with evidence from Rodgers (2018, 2023), who finds that increases in CDCC generosity generate increases in child care prices.

Finally, I test the sensitivity of my results to ignoring state CDCCs. Specifically, I conduct analyses in which $CDCC_{igst}$ —which is the sum of taxpayer i 's state and federal CDCCs in the

main specification—is comprised only of the the federal CDCC benefit. I then follow the steps outlined in the Empirical Strategy subsection to construct simulated CDCC benefit measures based on taxpayer’s federal benefits and include results in the appendix. As expected, ignoring state credits leads to overestimated effects on paid child care use: the statistically significant estimates for single (coefficient of 0.009, SE = 0.0037) and married (coefficient of 0.026, SE = 0.0045) mothers are 50 and 18 percent larger than those in Table 4, respectively. Thus, accounting for state CDCCs makes an important improvement upon Miller et al. (2015).

Labor Market Outcomes

To investigate the labor market incentives of the CDCC expansion described in the conceptual framework, I estimate effects on annual employment, unconditional usual hours worked per week, and unconditional annual earnings.¹⁶ As in the previous section, I estimate Equation (1) but replace $CDCC_{igst}$ with the simulated CDCC benefit measure. For these models, Y_{igst} is the labor market outcome of interest for individual i in demographic group g in state s during year t . I estimate models separately across single and married mothers.

Table 5 presents estimated effects of CDCC benefits on annual employment, unconditional usual hours worked per week, and unconditional annual earnings among single mothers. All estimates for single mothers are small and statistically insignificant. Evidence from Table 3 suggests that high levels of labor force attachment before the federal CDCC expansion may lead to the statistically insignificant increases in labor supply that I find within this group. In any case,

¹⁶ I estimate effects on unconditional outcomes because conditioning on having strictly positive hours worked or earnings could lead to selection issues. For example, I find that increases in CDCC benefits increase employment among married mothers. Because of this, if I were to restrict the sample to mothers with positive hours worked per week (or earnings), samples in post-CDCC expansion years likely would exhibit different unobservable characteristics than samples in pre-CDCC expansion years. If such unobservables were correlated with both CDCC benefits and outcomes, this would introduce endogeneity to the model.

results suggest that the CDCC serves as a transfer for single mothers, who respond to increases in generosity by increasing their paid child care participation but not their labor supply.

Turning to married mothers, the statistically significant employment effect implies that a \$100 increase in CDCC generosity leads to a 1.2 percentage point, or 1.7 percent, increase in employment. Estimated effects on hours worked per week and annual earnings are also positive and statistically significant: a \$100 increase in CDCC generosity leads to an additional 0.58 unconditional hours worked per week and \$541 in unconditional annual earnings. These effect sizes imply a 2.1 percent increase in hours worked and a 2.7 percent increase in earnings, respectively.

More generally, Table 5 shows that decreases in child care costs increase labor supply among married women and suggest that, at least to some extent, increases in labor supply account for increases in paid child care participation. Married mothers' substantial earnings responses imply large returns on investment to increases in CDCC generosity. More specifically, based on the lower bound of the confidence interval in Table 5, a \$100 increase in generosity leads to at least a \$178 increase in average annual earnings within this group.

Furthermore, if decreases in child care costs enable married mothers of young children to remain in the labor force, CDCC benefits may lead to long-run earnings gains (Angelov et al. 2016; Kleven et al. 2019a; Kleven et al. 2019b; Kleven et al. 2023). To investigate this possibility, Table 6 presents estimates across married mothers with and without children younger than two years old.

Estimated effects among married mothers with very young children are all positive and statistically significant at conventional levels. The effect on child care use implies that a \$100 increase in child care subsidy generosity increases paid child care participation by 1.9 percentage points, or 6.6 percent. Increases in employment fully explain increases in paid child care use: the

estimated effect on employment of 1.9 percentage points is identical to the estimated effect on paid child care use. This implies that a \$100 increase in child care subsidy generosity increases employment among married mothers with very young children by three percent (though I cannot rule out effect sizes as small as one percent). Taken together, results in Table 6 imply that increased CDCC generosity may mitigate labor force absences while children are young and that CDCC benefits could lead to long-run increases in mothers' earnings.

As in the previous section, I test the robustness of the results to alternative sample restrictions and identification assumptions. First, I estimate specifications in which I remove California, Louisiana, Maine, and Vermont from the analyses. Results from these specifications are similar to those from the main analyses. The statistically significant effect on married mothers' employment (coefficient of 0.013, SE = 0.0039) is nearly identical to that in Table 5. Estimates change little in specifications without state- and individual-level controls; the statistically significant employment effect among married mothers (coefficient of 0.012, SE = 0.0042) is in line with the estimate from the main analysis. Estimates also remain stable when I include state-year time trends. The statistically significant employment effect among married mothers (coefficient of 0.012, SE = 0.0042) changes very little. Similarly to effects on paid child care use, estimated effects of the previous year's CDCC benefits on married mothers' labor market outcomes exceed those in Table 5, which implies that parents may not respond to CDCC benefits until they file their taxes. Nevertheless, in no case do I reject the null hypothesis that estimates equal those in the main analyses.

Conclusion and Discussion

My results suggest that child care subsidies lead to increases in paid child care participation for

both single and married mothers and increases in labor supply for married mothers. For married mothers with very young children, increases in employment fully explain increases in paid child care use, but paid child care use effects exceed employment effects for other groups. This suggests that some mothers respond to the CDCC by substituting from parental or informal unpaid child care into paid child care arrangements. Increases in paid child care use indicate that the CDCC succeeds in its goal of assisting working parents in paying for child care.

Even under very different circumstances, the increases in paid child care use that I find are consistent with those of the existing literature that estimates the effects of expanding highly subsidized child care programs in Europe and Canada and finds that increases in child care subsidies increase paid child care participation (Baker et al. 2008; Givord et al. 2015). Furthermore, the relatively large and small labor supply responses among married and single mothers, respectively, are similar to the heterogeneous labor supply responses that researchers find across countries with different levels of female labor supply at baseline (Baker et al. 2008; Lefebvre et al. 2008; Bettendorf et al. 2015; Givord et al. 2015) and are consistent with evidence from existing literature that married mothers of young children have larger labor supply elasticities than single mothers (Eckstein, Keane, and Lifshitz 2019; Borella, De Nardi, and Yang 2023).

While this paper focuses on effects of the CDCC during the 2000s, findings likely extend to the current child care context. Despite relatively stable child care participation rates and an increase in child care spending as a proportion of household income since the mid-2000s, child care supports for moderate- to high-income families—who stand to benefit from the CDCC—largely have remained unchanged (Herbst 2023). One important exception is the dramatic expansion of state-funded preschool that has occurred over the past few decades, with state investments in preschool reaching an all-time high in 2023 (Friedman-Krauss et al. 2024). That

said, I find the largest effects of the CDCC among married mothers with infants and toddlers, for whom child care prices tend to be highest (Landivar et al. 2023). As the real value of the CDCC has decreased substantially since its expansion in 2003, there may be even more scope for increases in generosity to increase mothers' child care use and labor supply in the current economic and policy context.

The CDCC remains as only one aspect of a patchwork of programs that aim to support working families with children in the United States. In addition to the CDCC, this patchwork includes the Earned Income Tax Credit (EITC), the Child Tax Credit (CTC), and paid family leave. Each of these programs targets different types of families and generates different incentives. For example, unlike the CDCC, the fully-refundable EITC and partially-refundable CTC reach low-income households. Hence, it is unsurprising that single mothers, who tend to have lower household incomes, exhibit larger labor supply responses to EITC benefits than to CDCC benefits (Eissa and Liebman 1996; Keane and Moffitt 1998; Meyer and Rosenbaum 2001; Hoynes and Patel 2018; Michelmore and Pilkauskas 2021). In a similar vein, paid family leave promotes parental care arrangements, whereas the CDCC promotes outsourcing care.

The CDCC fills a gap in the patchwork of benefits for working families by directly promoting secondary earners' labor force participation. In particular, I find that the CDCC's requirement that both spouses in a married couple work leads to sizable, positive labor supply responses among married mothers that are not found in response to the other programs (Eissa and Hoynes 1998; Bailey, Byker, Patel, and Ramnath forthcoming). Results suggest that there could be large returns on investment to expanding the CDCC for these women but that single and low-income mothers may benefit more from other programs.

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Tables and Figures

Table 1. Federal CDCC Parameters over Time

	1982	2003
Max number of children	2	2
Max qualifying expenses per child	\$2,400	\$3,000
Max benefit rate	0.30	0.35
Max CDCC per child	\$720	\$1,050
Start of phase-out	\$10,000	\$15,000
End of phase-out	\$28,000	\$43,000
Max CDCC per child after phase-out	\$480	\$600
Refundable?	No	No

Source: Federal tax forms.

Notes: Federal CDCC parameters over time in nominal dollars. “Max number of children” indicates the maximum number of children younger than 13 years old for which taxpayers could receive CDCC benefits. “Start of phase-out” and “End of phase-out” indicate the AGI levels at which benefits begin to decrease and remain constant, respectively.

Table 2. Average Annual Child Care Expenditures in 2002 among SIPP Respondents by Demographic Group, Conditional on Paid Child Care Participation

	Single, 1 kid	Single, 2+ kids	Married, 1 kid	Married, 2+ kids
No kid <6, no college	\$2,308	\$3,966	\$1,792	\$3,544
No kid <6, college	\$2,809	\$5,201	\$3,485	\$4,530
Kid <6, no college	\$4,131	\$4,690	\$4,707	\$5,534
Kid <6, college	\$5,005	\$9,353	\$6,459	\$8,301

Source: SIPP Child Care Topical Module using household weights.

Notes: Average annual child care expenditures among SIPP Child Care Topical Module respondents from 2002 by marital status, number of children younger than 13 years old, the presence of at least one child younger than six years old, and an indicator for the mother’s education, conditional on paid child care participation.

Table 3. Summary Statistics

	Single mothers	Married mothers	Difference
Age	31.52 (0.085)	35.18 (0.041)	-3.67 {0.000}
White	0.64 (0.005)	0.86 (0.002)	-0.22 {0.000}
Black	0.31 (0.005)	0.08 (0.002)	0.23 {0.000}
College	0.12 (0.003)	0.32 (0.003)	-0.22 {0.000}
Kids <6	0.65 (0.008)	0.80 (0.00)	-0.16 {0.000}
Kids <17	1.90 (0.010)	2.03 (0.006)	-0.12 {0.000}
Child care	0.25 (0.004)	0.23 (0.002)	0.02 {0.000}
Employed	0.79 (0.004)	0.71 (0.003)	0.08 {0.000}
Hours	29.63 (0.173)	24.76 (0.110)	4.86 {0.000}
Earnings (\$)	18,126 (243)	19,695 (171)	-1,568 {0.000}
CDCC (\$)	129 (3)	151 (2)	-22 {0.000}
CDCC (conditional \$)	678 (7)	716 (4)	-38 {0.000}
Observations	14,586	41,709	
Representative of	19,907,080	53,812,188	

Source: Authors' calculations using the March CPS and SIPP Child Care Topical Module with household weights.

Notes: Summary statistics for mothers aged 18–54 in households with children younger than 13 years old from the 2001–2003 March CPS surveys. “Child care” indicates whether the household paid for child care, “Employed” indicates whether the individual was employed, and “Hours” indicates the usual number of hours that the individual worked per week during the previous calendar year. Earnings also are from the previous calendar year. Standard deviations are listed in parentheses, and *p*-values are listed in curly braces.

Table 4. Effects on Paid Child Care Use

Variables	Single	Married
	Child care	Child care
Simulated CDCC	0.006* (0.0029)	0.022*** (0.0041)
Age	0.001* (0.0004)	-0.000 (0.0003)
Black	-0.016* (0.0080)	0.049*** (0.0058)
Kids <17	-0.051*** (0.0023)	-0.051*** (0.0026)
Unemployment rate	-0.009 (0.0054)	0.002 (0.0036)
Minimum wage	0.000 (0.0060)	0.001 (0.0041)
Universal pre-K	0.011 (0.0240)	0.009 (0.0084)
Mean	0.25	0.23
Observations	51,553	138,903
Group, state, year FE	YES	YES

Notes: Effect of a \$100 increase in simulated CDCC benefits on annual paid child care use among single and married mothers. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table 5. Effects on Labor Market Outcomes

Variables	Single			Married		
	Employed	Hours	Earnings (\$)	Employed	Hours	Earnings (\$)
Simulated CDCC	-0.000 (0.0017)	-0.044 (0.0851)	-145 (159)	0.012*** (0.0041)	0.582*** (0.1399)	541*** (185)
Age	0.003*** (0.0005)	0.275*** (0.0136)	445*** (20)	0.001** (0.0004)	0.007 (0.0147)	367*** (19)
Black	-0.025*** (0.0075)	-0.247 (0.3232)	-753** (374)	0.120*** (0.0076)	6.951*** (0.2908)	4,704*** (446)
Kids <17	-0.036*** (0.0024)	-1.762*** (0.1291)	-1,856*** (115)	-0.042*** (0.0030)	-1.824*** (0.1271)	-2,606*** (139)
Unemployment rate	-0.007* (0.0040)	-0.403** (0.1917)	-195 (292)	0.005 (0.0031)	0.207 (0.1238)	133 (128)
Minimum wage	0.003 (0.0051)	0.171 (0.2060)	-268 (368)	-0.001 (0.0043)	0.043 (0.1963)	-244 (274)
Universal pre-K	0.010 (0.0145)	0.822 (0.5772)	235 (781)	0.003 (0.0125)	0.102 (0.3836)	113 (823)
Mean	0.79	29.63	18,126	0.71	24.76	19,694
Observations	51,553	51,553	51,553	138,903	138,903	138,903
Group, state, year FE	YES	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on labor market outcomes among single and married mothers. “Employed” indicates whether the mother is employed, “Hours” indicates the unconditional number of hours that the mother usually works per week, and “Earnings” is the mother’s unconditional annual earnings. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

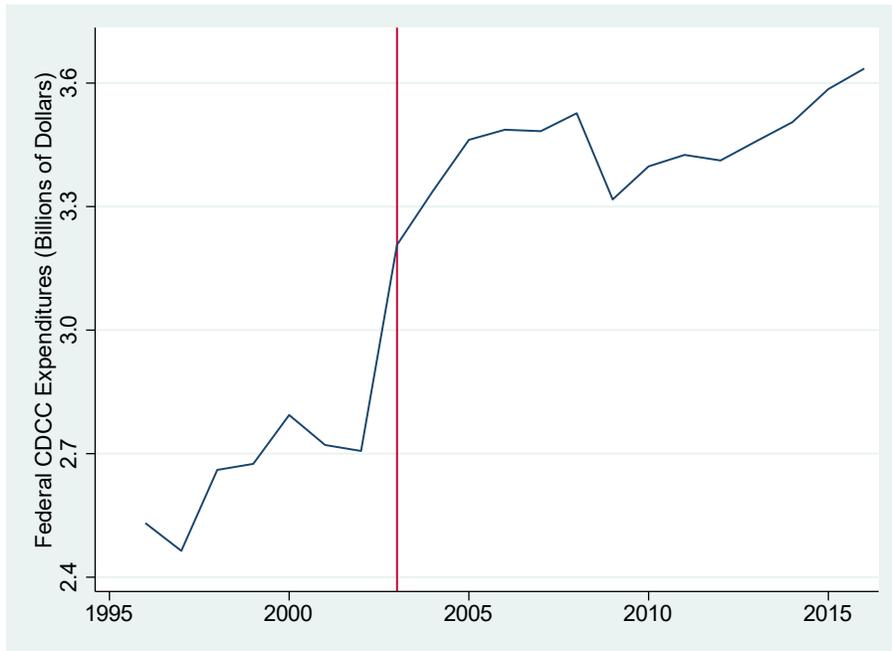
Table 6. Effects on Paid Child Care Use and Labor Market Outcomes among Married Mothers by the Presence of a Child Younger than Two Years Old

Variables	Child <2 years				No child <2 years			
	Child care	Employed	Hours	Earnings (\$)	Child care	Employed	Hours	Earnings (\$)
Simulated CDCC	0.019*** (0.0066)	0.019*** (0.0064)	0.950*** (0.2478)	643** (302)	0.021*** (0.0048)	0.009** (0.0043)	0.484*** (0.1408)	563** (217)
Age	0.004*** (0.0006)	0.004*** (0.0006)	0.173*** (0.0242)	575*** (33)	-0.002*** (0.0003)	-0.001*** (0.0004)	-0.097*** (0.0156)	273*** (22)
Black	0.077*** (0.0165)	0.144*** (0.0141)	7.782*** (0.5461)	4,377*** (700)	0.040*** (0.0072)	0.111*** (0.0080)	6.627*** (0.3120)	4,743*** (535)
Kids <17	-0.051*** (0.0040)	-0.057*** (0.0060)	-2.321*** (0.2178)	-2,946*** (192)	-0.053*** (0.0026)	-0.036*** (0.0026)	-1.626*** (0.1093)	-2,516*** (186)
Unemployment rate	0.011* (0.0062)	0.013** (0.0060)	0.608*** (0.1971)	506** (313)	-0.002 (0.0037)	0.002 (0.0031)	0.058 (0.1416)	-2 (147)
Minimum wage	0.008 (0.0059)	-0.004 (0.0076)	-0.284 (0.3613)	-1,060** (432)	-0.001 (0.0047)	-0.000 (0.0045)	0.152 (0.2037)	47 (309)
Universal pre-K	-0.011 (0.0196)	0.004 (0.0186)	0.501 (0.9052)	79 (1,193)	0.014 (0.0091)	0.001 (0.0143)	-0.119 (0.4901)	60 (965)
Group, state, year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean	0.29	0.63	21.41	16,647	0.21	0.73	25.92	20,745
Observations	34,586	34,586	34,586	34,586	104,317	104,317	104,317	104,317

Notes: Effects of a \$100 increase in simulated CDCC benefits on paid child care participation and labor market outcomes among married mothers by child age. “Child care” indicates annual paid child care use, “Employed” indicates whether the mother is employed, “Hours” indicates the unconditional number of hours that the mother usually works per week, and “Earnings” is the mother’s unconditional annual earnings. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

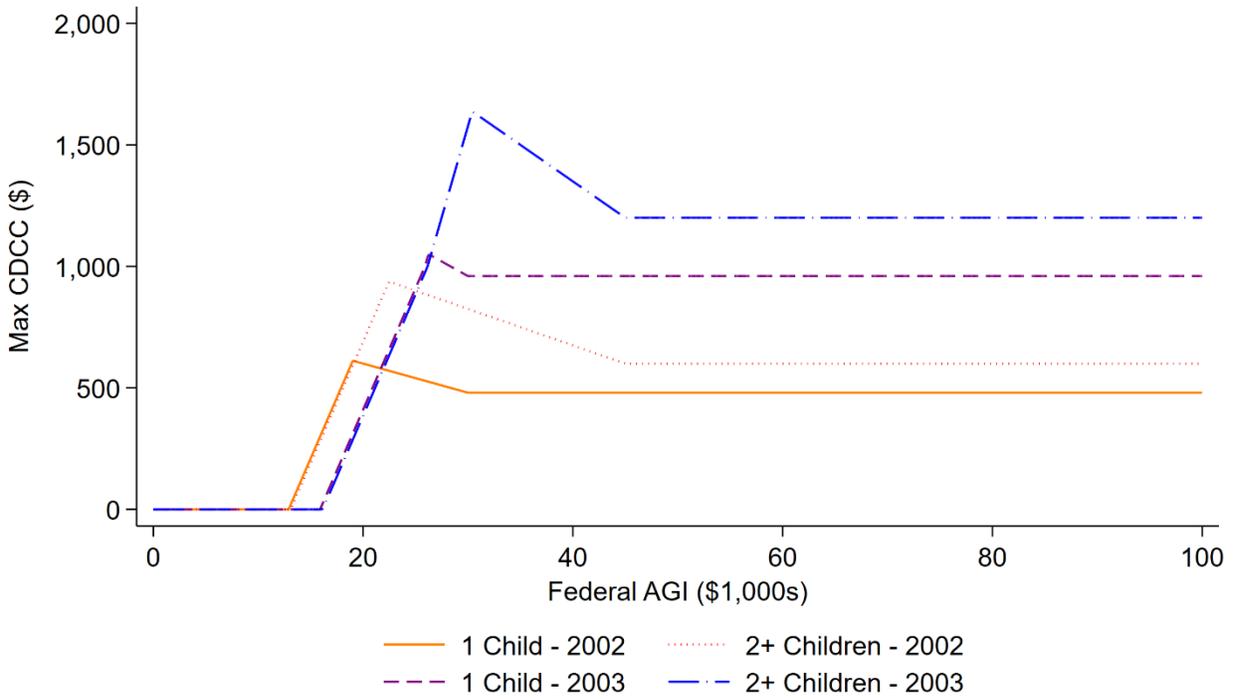
Figure 1. Federal CDCC Expenditures over Time



Source: IRS Statistics of Income.

Notes: Federal CDCC expenditures over time in nominal dollars.

Figure 2. Maximum Effective Federal CDCC Benefits by Federal AGI



Source: Federal tax forms.

Notes: Maximum effective federal CDCC benefits for households with one or two or more eligible dependents before and after the federal CDCC expansion in 2003 in nominal dollars.

Appendix A

CDCC Interactions with Other Tax Code Elements

Both before and after the federal CDCC expansion, the CDCC has interacted with other elements of the tax code in a complicated way. For instance, for some taxpayers, federal CDCC benefits directly offset benefits from the Child Tax Credit (CTC), a tax credit for families based on number of children. Before 2001, the CTC was a nonrefundable credit worth up to \$500 per child. The Bush tax cuts increased the CTC to \$600 per child in 2001 and \$1,000 per child in 2003 and created the Additional Child Tax Credit (ACTC), a refundable portion of the CTC, in 2001. Because of this, taxpayers without taxable income after deductions could receive ACTC benefits worth up to 10 percent of their AGI above \$10,000 beginning in 2001 and up to 15 percent of their AGI over \$10,000 beginning in 2004. The CDCC came before the CTC on Federal Form 1040 and, therefore, reduced taxpayers' tax liability. Taxpayers with positive tax liability before claiming CDCC benefits but without positive tax liability after claiming the CDCC became ineligible for the nonrefundable portion of the CTC but remained eligible for the ACTC. Because the ACTC was limited to a percent of AGI over \$10,000, however, CDCC benefits decreased CTC benefits for some taxpayers.

Table A2 illustrates interactions between the CDCC and CTC for hypothetical taxpayers. In particular, Table A2 shows federal taxable income and CDCC and CTC benefits for unmarried taxpayers with two children younger than 13 years old, at least \$6,000 in child care expenditures, and different gross income levels as of 2003. I assume that all income comes from earnings and that taxpayers tax-minimize. Taxpayers with only \$10,000 in earnings do not have taxable income and do not benefit from the CDCC or CTC. Taxpayers with \$25,000, \$50,000, and \$100,000 in earnings, however, have taxable income and benefit from both the CDCC and

CTC. Taxpayers with \$25,000 in earnings, for example, receive \$885, or four percent of their income, in federal CDCC benefits and \$1,450 in ACTC benefits. Without claiming the CDCC, however, those taxpayers would have had higher tax liability and received an additional \$550 in CTC benefits. Taxpayers with \$50,000 and \$100,000 in earnings have tax liability sufficiently high to be eligible for only the nonrefundable portion of the CTC, so claiming the CDCC does not affect their CTC benefits.

Additionally, 40 percent of workers can access dependent care flexible spending accounts (FSA) that their employers offer, which interact with CDCC benefits (U.S. Bureau of Labor Statistics 2018). Since 1986, employees who receive FSAs from their employers have been able to set aside up to \$5,000 of earnings before taxes for dependent care expenses.¹ The employer deducts this income from employees' paychecks, but employees are reimbursed for qualified child care expenses, which, similar to the CDCC, include expenditures on care inside and outside of the home. Unlike the CDCC, however, the decision to set aside funds for an FSA occurs before the employee's child care expenditures are realized.

While taxpayers may receive benefits from both FSAs and the CDCC, they may not double count expenses across the two child care subsidy programs. Furthermore, taxpayers must reduce their qualifying CDCC expenses by every pretax dollar claimed under an FSA. For example, if a family with one qualifying individual and \$5,000 in child care expenditures had set aside \$2,000 in pretax earnings for an FSA, they could claim the remaining \$3,000 in child care expenditures for the CDCC. FSAs generally provide larger tax benefits per dollar than the federal CDCC, given the CDCC's nonrefundability and high marginal tax rates among high-income taxpayers. Nevertheless, Table 2 shows that many families spend over \$5,000 per year in child

¹ The expense limit was increased to \$10,500 during 2021.

care and can benefit from both programs. In addition, low-income families are relatively unlikely to have access to dependent care FSAs, as only about 20 percent of workers with wages in the bottom quartile are offered FSA benefits (U.S. Bureau of Labor Statistics 2018). Table A2 shows the maximum FSA benefits that unmarried taxpayers with two children could receive at different income levels as of 2003. Potential FSA benefits increase with income as taxpayers move into higher tax brackets. Specifically, taxpayers with \$10,000 or \$25,000 in earnings can receive up to \$750 in FSA benefits, while taxpayers with \$50,000 and \$100,000 in earnings can receive up to \$1,250 and \$1,400 in benefits, respectively.

Furthermore, the Earned Income Tax Credit (EITC), an earnings subsidy targeted at low- and moderate-income families with children, also affects parents' labor supply decisions. While EITC benefits are not a function of the CDCC, both the CDCC and EITC promote work for families with children. Specifically, EITC benefits increase with household earnings until they reach a maximum benefit level. Benefits then remain constant until household earnings reach another level at which benefits begin to phase out toward zero. And as with the CDCC, several states have their own EITC programs. Unlike the federal CDCC, however, the federal EITC depends only on household earnings, is fully refundable, and did not change between 2000 and 2008. Researchers show that EITC benefits increase extensive margin labor supply among single mothers (Eissa and Liebman 1996; Keane and Moffitt 1998; Meyer and Rosenbaum 2001; Hoynes and Patel 2018; Micheltore and Pilkauskas 2021) and decrease extensive margin labor supply among married mothers (Eissa and Hoynes 1998). While intensive margin effects tend to be smaller, Chetty, Friedman, and Saez (2013) use data on all US taxpayers to find intensive-margin earnings elasticities of 0.31 in the phase-in region and 0.14 in the phase-out region of the credit.

While the CDCC and EITC may interact, differences in program targeting likely limit interactions between the two tax credits. For instance, the refundable EITC reaches low-income taxpayers who do not qualify for the CDCC. Table A2 shows that taxpayers with \$10,000 in earnings are eligible for \$4,000 in federal EITC benefits but \$0 in CDCC benefits. High-income taxpayers, in contrast, can qualify for CDCC benefits but are ineligible for the EITC. Table A2 shows that taxpayers with \$50,000 and \$100,000 in earnings receive \$1,200 in CDCC benefits but \$0 in federal EITC benefits.²

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² The Child Care and Development Fund (CCDF) also provides funding to states to administer child care subsidy programs for very-low-income families. These state child care subsidy programs generally target families participating in or transitioning out of the TANF program, serving about 800,000 families as of 2017 (Office of Child Care, Administration for Children and Families, U.S. Department of Health and Human Services 2019). Families that receive child care subsidies through CCDF generally do not benefit from the federal CDCC as their incomes are too low to have positive tax liability after other deductions.

Tables and Figures

Table A1. Characteristics of State CDCC Programs as of 2002

State	Statutory max	Effective max	Refundable?	AGI limit	Provision
AR	\$288	\$237	No	N/A	20% of federal CDCC
CA	\$907	\$907	Yes	\$100,000	63% of federal CDCC
CO	\$720	\$596	No	\$60,000	50% of federal CDCC
DE	\$720	\$596	No	N/A	50% of federal CDCC
DC	\$461	\$461	Yes	N/A	32% of federal CDCC
HI	\$1,200	\$1,200	Yes	N/A	25% of federal CDCC expenditures
IA	\$1,080	\$1,080	Yes	\$40,000	75% of federal CDCC
KS	\$360	\$298	No	N/A	25% of federal CDCC
KY	\$288	\$288	Yes	N/A	20% of federal CDCC
ME	\$360	\$262	No	N/A	25% of federal CDCC
MD	\$468	\$341	No	\$50,000	32.5% of federal CDCC
MN	\$1,079	\$1,079	No	\$32,250	Federal CDCC for which eligible
NE	\$1,440	\$1,193	No	N/A	100% of federal CDCC
NM	\$1,200	\$1,200	Yes	\$21,424	40% of eligible child care expenditures
NY	\$1,584	\$1,584	Yes	N/A	110% of federal CDCC
NC	\$432	\$432	Yes	N/A	9% of federal CDCC expenditures
OH	\$1,440	\$1,440	Yes	\$40,000	100% of federal CDCC
OK	\$288	\$239	No	N/A	20% of federal CDCC
OR	\$1,920	\$1,440	No	\$45,000	30% of “allowable” federal CDCC expenditures
RI	\$360	\$262	No	N/A	25% of federal CDCC
SC	\$336	\$336	Yes	N/A	7% of federal CDCC expenditures
VT	\$346	\$252	No	N/A	24% of federal CDCC

Source: State and federal tax forms.

Notes: Characteristics of state CDCC programs as of 2002. Columns “Statutory max” and “Effective max” list statutory and effective maximum state CDCC benefits, respectively. “AGI limit” lists the AGI at which the household is no longer eligible for CDCC benefits. “Provision” displays the calculation to determine the state’s statutory CDCC benefits.

Table A2. Federal Tax Benefits for Unmarried Taxpayers with Two Children as of 2003

	\$10,000	\$25,000	\$50,000	\$100,000
Federal taxable income	\$0	\$8,850	\$33,850	\$83,850
Federal CDCC	\$0	\$885	\$1,200	\$1,200
CDCC % of income	0%	4%	2%	1%
Nonrefundable CTC	\$0	\$0	\$2,000	\$750
ACTC	\$0	\$1,450	\$0	\$0
CTC loss from CDCC	\$0	\$550	\$0	\$0
Potential FSA benefits	\$750	\$750	\$1,250	\$1,400
Federal EITC	\$4,000	\$1,831	\$0	\$0

Source: Author's calculations from federal tax forms.

Notes: Federal taxable income and benefits for unmarried taxpayers with two children younger than 13 years old and \$10,000, \$25,000, \$50,000, or \$100,000 in income, where all income comes from earnings and taxpayers have the maximum qualifying child care expenditures and tax-minimize as of 2003. "CTC Loss from CDCC" indicates the additional CTC benefits that the taxpayer would have received if they had not claimed the CDCC. "Potential FSA benefits" are the maximum dependent care FSA benefits that the taxpayer can receive if their employer offers an FSA.

Table A3. Sources of Variation in Simulated CDCC Benefits

Regressors	R^2
Demographic group	0.361
State	0.168
Year	0.006

Source: R^2 's from regressions of $CDCC_{igst}$ on sources of variation. Demographic groups are defined by number of children younger than age 13, the presence of a child younger than age 6, and whether the mother has a college education.

Table A4. Alternative Specifications for Effects on Paid Child Care Use among Single Mothers

Variables	(1) Child care	(2) Child care	(3) Child care	(4) Child care	(5) Child care
Simulated CDCC	0.007** (0.0029)	0.005* (0.0030)	0.005* (0.0029)	0.009** (0.0037)	-0.005 (0.0090)
Age	0.001 (0.0004)		0.001* (0.0004)	0.001* (0.0004)	-0.001 (0.0007)
Black	-0.016* (0.0085)		-0.016* (0.0081)	-0.016* (0.0080)	-0.011 (0.0154)
Kids <17	-0.052*** (0.0027)		-0.051*** (0.0023)	-0.051*** (0.0023)	-0.041*** (0.0066)
Unemployment rate	-0.013** (0.0053)		-0.005 (0.0057)	-0.009 (0.0054)	-0.006 (0.0148)
Minimum wage	-0.002 (0.0063)		-0.005 (0.0087)	0.000 (0.0061)	-0.021 (0.0247)
Universal pre-K	0.013 (0.0261)		0.022 (0.0312)	0.011 (0.0240)	-0.030 (0.0473)
Mean	0.25	0.25	0.25	0.25	0.20
Observations	44,869	51,553	51,553	51,553	5,526
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated e CDCC benefits on annual paid child care use among single mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A5. Alternative Specifications for Effects on Paid Child Care Use among Married Mothers

Variables	(1) Child care	(2) Child care	(3) Child care	(4) Child care	(5) Child care
Simulated CDCC	0.023*** (0.0042)	0.023*** (0.0041)	0.022*** (0.0041)	0.026*** (0.0045)	0.031*** (0.0062)
Age	-0.001* (0.0003)		-0.000 (0.0003)	-0.000 (0.0003)	-0.003*** (0.0005)
Black	0.049*** (0.0053)		0.049*** (0.0058)	0.049*** (0.0058)	0.037** (0.0154)
Kids <17	-0.054*** (0.0018)		-0.051*** (0.0026)	-0.051*** (0.0026)	-0.048*** (0.0055)
Unemployment rate	0.000 (0.0038)		0.006 (0.0035)	0.002 (0.0037)	-0.000 (0.0089)
Minimum wage	0.001 (0.0044)		-0.003 (0.0057)	0.001 (0.0041)	-0.008 (0.0069)
Universal pre-K	0.007 (0.0088)		0.018 (0.0115)	0.009 (0.0085)	-0.011 (0.0119)
Mean	0.23	0.23	0.23	0.23	0.22
Observations	121,313	138,903	138,903	138,903	19,101
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on annual paid child care use among married mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A6. Effects on Paid Child Care Use by Metropolitan Status

Variables	Single		Married	
	Metro Child care	Non-metro Child care	Metro Child care	Non-metro Child care
Simulated CDCC	0.005* (0.0031)	0.008 (0.0054)	0.019*** (0.0042)	0.023*** (0.0055)
Age	0.001** (0.0004)	-0.000 (0.0006)	-0.000 (0.0003)	-0.002*** (0.0005)
Black	-0.018** (0.0083)	0.003 (0.0238)	0.053*** (0.0051)	0.023 (0.0179)
Kids <17	-0.050*** (0.0024)	-0.055*** (0.0062)	-0.051*** (0.0032)	-0.052*** (0.0039)
Unemployment rate	-0.007 (0.0064)	-0.020 (0.0125)	0.001 (0.0043)	-0.006 (0.0076)
Minimum wage	-0.001 (0.0071)	0.001 (0.0227)	-0.000 (0.0042)	0.007 (0.0125)
Universal pre-K	0.014 (0.0234)	-0.010 (0.0455)	0.008 (0.0079)	0.036** (0.0145)
Mean	0.25	0.23	0.23	0.23
Observations	41,099	10,144	108,561	29,308
Group, state, year FE	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on annual paid child care use, by marital status and metropolitan status.

Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A7. Alternative Specifications for Effects on Employment among Single Mothers

VARIABLES	(1) Employed	(2) Employed	(3) Employed	(4) Employed	(5) Employed
Simulated CDCC	0.001 (0.0014)	-0.001 (0.0017)	-0.000 (0.0017)	0.001 (0.0018)	-0.003 (0.0045)
Age	0.002*** (0.0005)		0.003*** (0.0005)	0.003*** (0.0005)	0.004*** (0.0011)
Black	-0.028*** (0.0081)		-0.025*** (0.0075)	-0.025*** (0.0075)	-0.029** (0.0127)
Kids <17	-0.036*** (0.0028)		-0.036*** (0.0024)	-0.036*** (0.0024)	-0.044*** (0.0085)
Unemployment rate	-0.008* (0.0044)		-0.009 (0.0057)	-0.007* (0.0040)	0.028** (0.0134)
Minimum wage	0.005 (0.0050)		0.004 (0.0065)	0.003 (0.0051)	0.026 (0.0256)
Universal pre-K	-0.000 (0.0120)		0.010 (0.0172)	0.010 (0.0145)	-0.105* (0.0576)
Mean	0.79	0.80	0.80	0.80	0.77
Observations	44,869	51,553	51,553	51,553	5,526
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on employment among single mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A8. Alternative Specifications for Effects on Hours Worked per Week among Single Mothers

Variables	(1) Hours	(2) Hours	(3) Hours	(4) Hours	(5) Hours
Simulated CDCC	0.017 (0.0756)	-0.059 (0.0881)	-0.055 (0.0860)	-0.014 (0.0969)	-0.079 (0.2506)
Age	0.271*** (0.0164)		0.276*** (0.0137)	0.275*** (0.0136)	0.285*** (0.0413)
Black	-0.415 (0.3368)		-0.239 (0.3253)	-0.247 (0.3234)	-0.515 (0.6307)
Kids <17	-1.786*** (0.1532)		-1.762*** (0.1286)	-1.762*** (0.1291)	-2.051*** (0.3726)
Unemployment rate	-0.454** (0.2218)		-0.437 (0.2867)	-0.403** (0.1916)	0.990* (0.5207)
Minimum wage	0.247 (0.1970)		0.187 (0.3068)	0.171 (0.2058)	0.665 (0.9911)
Universal pre-K	0.479 (0.5330)		0.873 (0.5894)	0.822 (0.5774)	-2.165 (2.6420)
Mean	30.07	29.63	29.63	29.63	29.44
Observations	44,869	51,553	51,553	51,553	5,526
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on unconditional usual hours worked per week among single mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A9. Alternative Specifications for Effects on Earnings among Single Mothers

Variables	(1) Earnings (\$)	(2) Earnings (\$)	(3) Earnings (\$)	(4) Earnings (\$)	(5) Earnings (\$)
Simulated CDCC	-203 (161)	-166 (169)	-135 (163)	-226 (231)	-16 (339)
Age	451*** (24)		445*** (20)	445*** (20)	467*** (35)
Black	-953*** (351)		-771** (377)	-752** (374)	-1,366* (713)
Kids <17	-1,893*** (131)		-1,858*** (115)	-1,856*** (115)	-1,616*** (328)
Unemployment rate	-218 (351)		380 (293)	-191 (291)	1,799*** (529)
Minimum wage	-368 (390)		-209 (465)	-265 (368)	1,794* (999)
Universal pre-K	37 (882)		598* (356)	233 (781)	-853 (790)
Mean	18,315	18,126	18,126	18,126	19,289
Observations	44,869	51,553	51,553	51,553	5,526
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on unconditional annual earnings among single mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A10. Alternative Specifications for Effects on Employment among Married Mothers

Variables	(1) Employed	(2) Employed	(3) Employed	(4) Employed	(5) Employed
Simulated CDCC	0.013*** (0.0039)	0.012*** (0.0042)	0.012*** (0.0042)	0.014*** (0.0045)	0.030*** (0.0080)
Age	0.001* (0.0004)		0.001** (0.0004)	0.001** (0.0004)	0.001** (0.0007)
Black	0.120*** (0.0082)		0.120*** (0.0076)	0.120*** (0.0076)	0.121*** (0.0144)
Kids <17	-0.044*** (0.0031)		-0.042*** (0.0031)	-0.042*** (0.0031)	-0.062*** (0.0045)
Unemployment rate	0.004 (0.0033)		0.006 (0.0040)	0.005 (0.0030)	-0.012 (0.0089)
Minimum wage	-0.001 (0.0044)		-0.004 (0.0034)	-0.001 (0.0042)	0.004 (0.0125)
Universal pre-K	0.005 (0.0129)		-0.003 (0.0153)	0.003 (0.0125)	-0.033*** (0.0105)
Mean	0.72	0.71	0.71	0.71	0.71
Observations	121,313	138,903	138,903	138,903	19,101
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on employment among married mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual-level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A11. Alternative Specifications for Effects on Hours Worked per Week among Married Mothers

Variables	(1) Hours	(2) Hours	(3) Hours	(4) Hours	(5) Hours
Simulated CDCC	0.591*** (0.1319)	0.606*** (0.1485)	0.587*** (0.1437)	0.645*** (0.1644)	1.126*** (0.2955)
Age	0.003 (0.0152)		0.008 (0.0147)	0.007 (0.0148)	0.018 (0.0287)
Black	7.029*** (0.3145)		6.953*** (0.2920)	6.949*** (0.2910)	7.532*** (0.5175)
Kids <17	-1.941*** (0.0934)		-1.824*** (0.1270)	-1.823*** (0.1274)	-2.627*** (0.2216)
Unemployment rate	0.157 (0.1351)		0.261* (0.1448)	0.212* (0.1220)	-0.291 (0.3648)
Minimum wage	-0.030 (0.2050)		-0.293** (0.1431)	0.048 (0.1957)	0.969* (0.5040)
Universal pre-K	0.155 (0.3771)		-0.400 (0.5277)	0.106 (0.3846)	-0.838** (0.3896)
Mean	24.99	24.76	24.76	24.76	24.79
Observations	121,313	138,903	138,903	138,903	19,101
Group state year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on unconditional usual hours worked per week among married mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A12. Alternative Specifications for Effects on Earnings among Married Mothers

Variables	(1) Earnings (\$)	(2) Earnings (\$)	(3) Earnings (\$)	(4) Earnings (\$)	(5) Earnings (\$)
Simulated CDCC	544*** (192)	574*** (187)	552*** (183)	769*** (218)	901** (389)
Age	365*** (22)		367*** (19)	367*** (19)	325*** (38)
Black	4,480*** (391)		4,704*** (444)	4,701*** (445)	4,406*** (836)
Kids <17	-2,575*** (161)		-2,601*** (139)	-2,604*** (139)	-2,813*** (353)
Unemployment rate	136 (137)		88 (184)	136 (128)	-789 (541)
Minimum wage	-24 (258)		-440* (258)	-237 (272)	-712 (827)
Universal pre-K	582 (849)		306 (1,311)	120 (824)	-378 (1,405)
Mean	19,851	19,695	19,695	19,695	21,390
Observations	121,313	138,903	138,903	138,903	19,101
Group, state, year FE	YES	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on unconditional annual earnings among married mothers. (1) lists results from specifications without California, Louisiana, Maine, and Vermont. (2) lists results from specifications without state- and individual- level controls. (3) lists results from specifications with state-year time trends. (4) lists results from specifications using federal CDCC benefits only. (5) lists effects of the previous year's CDCC benefits. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A13. Effects on Paid Child Care Use and Labor Market Outcomes among Single Fathers

Variables	Child care	Employed	Hours	Earnings (\$)
Simulated CDCC	0.000 (0.0054)	0.000 (0.0037)	-0.156 (0.1928)	-524 (565)
Age	0.002*** (0.0003)	0.005*** (0.0006)	0.456*** (0.0178)	900*** (40)
Black	-0.003 (0.0134)	-0.132*** (0.0124)	-5.747*** (0.5285)	-6,464*** (509)
Kids \$<\$17	-0.047*** (0.0040)	-0.029*** (0.0060)	-1.443*** (0.2217)	-1,169*** (398)
Unemployment rate	0.006 (0.0066)	-0.011 (0.0065)	-0.790*** (0.2564)	-640 (625)
Minimum wage	0.013 (0.0110)	-0.009 (0.0095)	-0.599 (0.4470)	-255 (877)
Universal pre-K	0.029** (0.0137)	0.047** (0.0194)	1.514*** (0.5011)	3,667*** (1,207)
Mean	0.20	0.81	32.20	21,998
Observations	19,280	19,280	19,280	19,280
Group, state, year FE	YES	YES	YES	YES

Notes: Effects of a \$100 increase in simulated CDCC benefits on paid child care use and labor market outcomes among single fathers. “Child care” indicates whether the father paid for child care, “Employed” indicates whether the father is employed, “Hours” indicates the unconditional number of hours that the father usually works per week, and “Earnings” is the father’s unconditional annual earnings. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

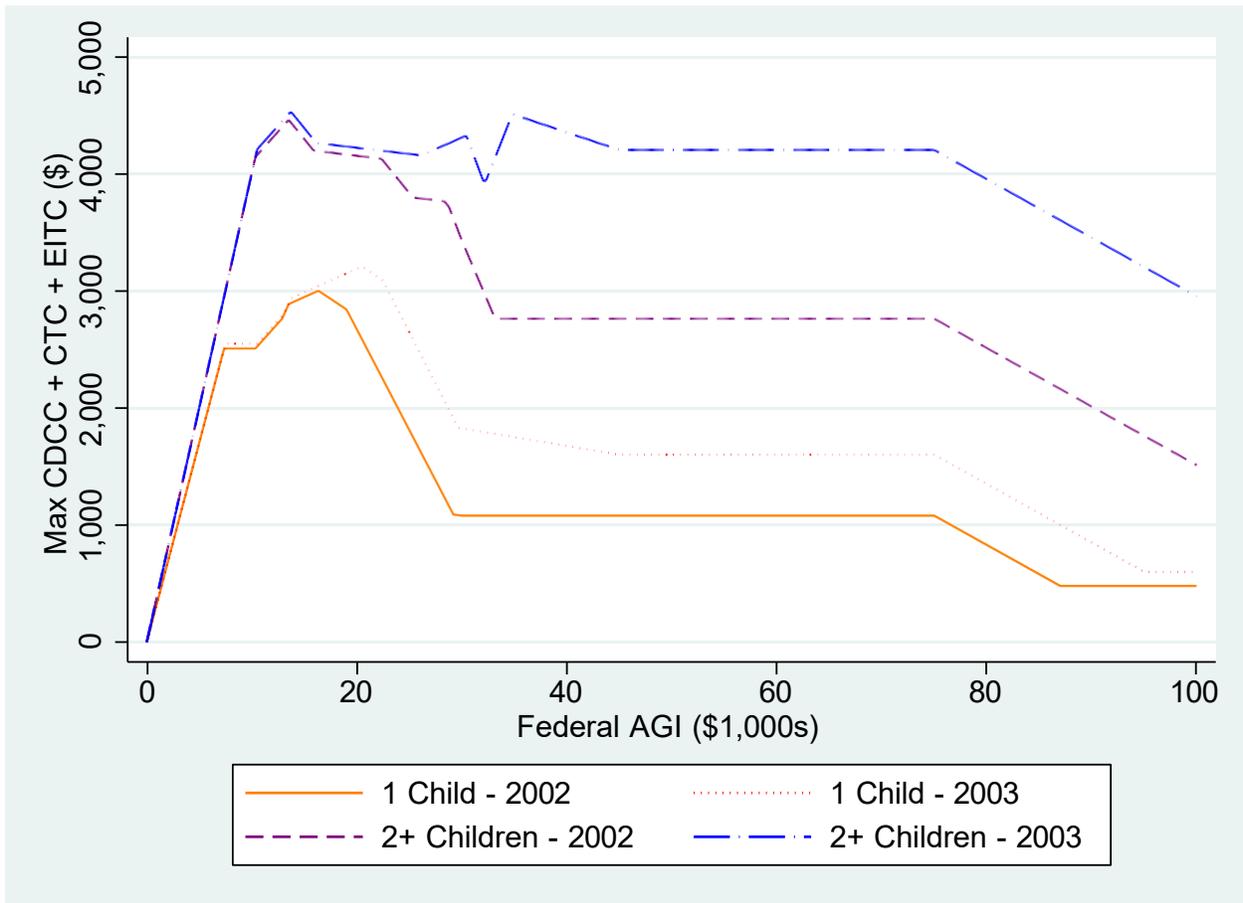
Table A14. Effects on Labor Market Outcomes among Married Fathers

Variables	Employed	Hours	Earnings (\$)
Simulated CDCC	0.000 (0.0012)	-0.041 (0.0684)	-347 (667)
Age	-0.001*** (0.0002)	0.007 (0.0114)	1,116*** (30)
Black	-0.041*** (0.0042)	-3.633*** (0.2572)	-15,327*** (1,271)
Kids <17	-0.005*** (0.0015)	-0.050 (0.1100)	56 (576)
Unemployment rate	-0.004*** (0.0013)	-0.207** (0.0916)	-1,131*** (407)
Minimum wage	-0.000 (0.0020)	0.069 (0.1191)	-979 (631)
Universal pre-K	0.002 (0.0075)	-0.267 (0.2474)	1,085 (954)
Mean	0.96	43.58	56,266
Observations	136,992	136,992	136,992
Group, state, year FE	YES	YES	YES

Notes: Effects of a \$100 increase simulated CDCC benefits on labor market outcomes among married fathers. “Employed” indicates whether the father is employed, “Hours” indicates the unconditional number of hours that the father usually works per week, and “Earnings” is the father’s unconditional annual earnings. Standard errors are clustered at the state level and listed in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

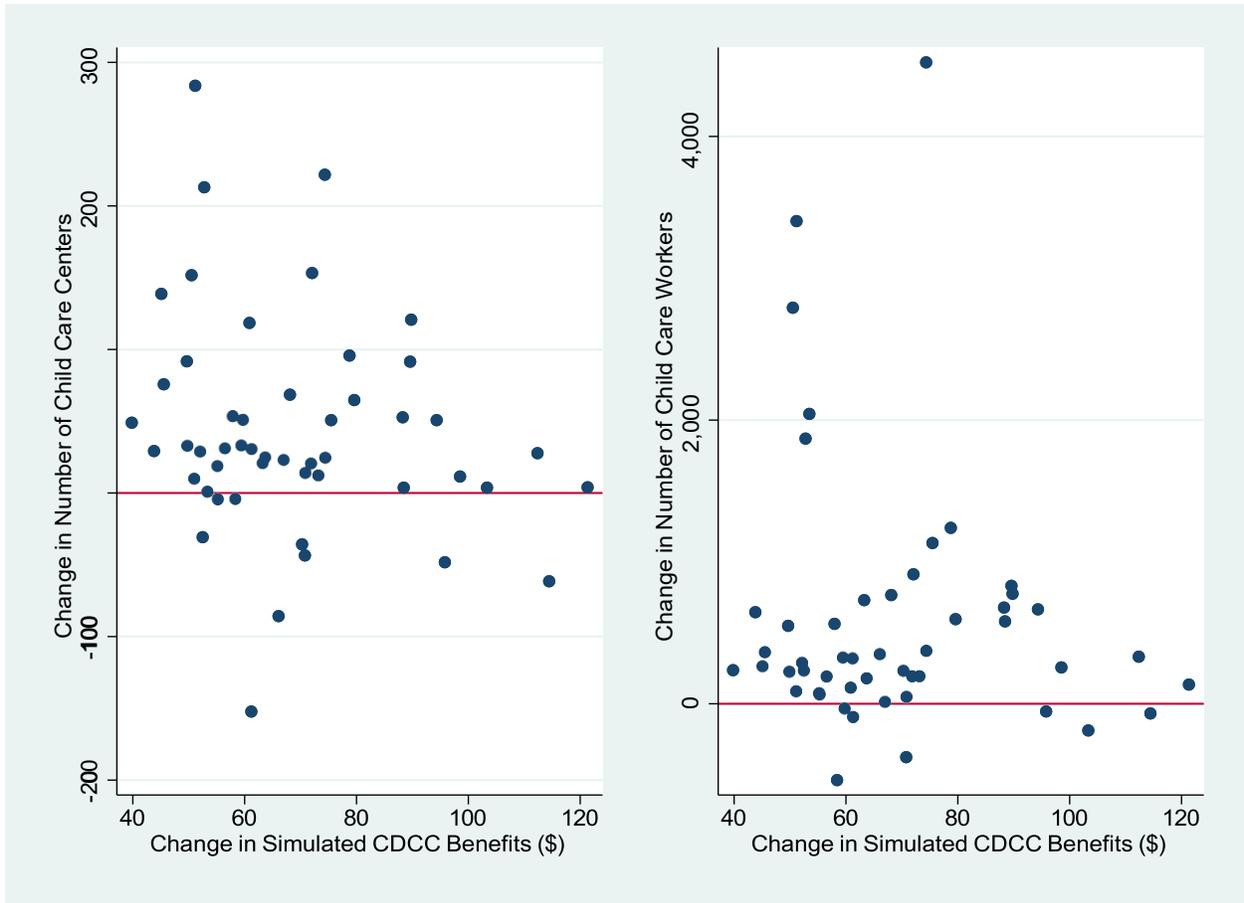
Figure A1. Maximum Effective Total Federal CDCC, CTC, and EITC Benefits by AGI



Source: Author's calculations from TAXSIM.

Notes: Maximum effective total federal CDCC, CTC, and EITC benefits among families with one or two or more eligible dependents by annual income as of 2002.

Figure A2. Correlations between Changes in Simulated Real CDCC Benefits and Numbers of Child Care Centers and Workers



Source: Author's calculations from Quarterly Census of Employment and Wages.

Notes: Correlations between changes in simulated real CDCC benefits and numbers of child care centers and workers between 2003–2005 and 2000–2002.