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# THE ANTI-POVERTY, TARGETING, AND LABOR SUPPLY EFFECTS OF REPLACING A CHILD TAX CREDIT WITH A CHILD ALLOWANCE

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The Anti-Poverty, Targeting, and Labor Supply Effects of Replacing a Child Tax Credit with a Child Allowance

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## ABSTRACT

The replacement of the Child Tax Credit (CTC) with a child allowance has been advocated by numerous policymakers and researchers. We estimate the anti-poverty, targeting, and labor supply effects of such a change by linking survey data with administrative tax and government program data which form part of the Comprehensive Income Dataset (CID). We focus on the provisions of the 2021 Build Back Better Act, which would have increased maximum benefit amounts to $3,000 or $3,600 per child (up from $2,000 per child) and made the full credit available to all low and middle-income families regardless of earnings or income. Initially ignoring any behavioral responses, we estimate that the replacement of the CTC would reduce child poverty by 34% and deep child poverty by 39%. The change to a child allowance would have a larger anti-poverty effect on children than any existing government program, though at a higher cost per child raised above the poverty line than any other means-tested program. Relatedly, the child allowance would allocate a smaller share of its total dollars to families at the bottom of the income distribution—as well as families with the lowest levels of long-term income, education, or health—than any existing means-tested program with the exception of housing assistance. We then simulate anti-poverty effects accounting for labor supply responses. By replacing the CTC (which contained substantial work incentives akin to the EITC) with a child allowance, the policy change would reduce the return to working at all by at least $2,000 per child for most workers with children. Relying on elasticity estimates consistent with mainstream simulation models and the academic literature, we estimate that this change in policy would lead 1.5 million workers (constituting 2.6% of all working parents) to exit the labor force. The decline in employment and the consequent earnings loss would mean that child poverty would only fall by at most 22% and deep child poverty would not fall at all with the policy change.

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# 1. Introduction

Policymakers require accurate evidence on the effects of potential policies to make informed decisions. The proposed replacement of the Child Tax Credit (CTC) with a child allowance provides a particularly salient case study. Recommended by the National Academy of Sciences (NAS), proposed by the President, and nearly passed by Congress, the changes would have replaced the existing Tax Cuts and Jobs Act (TCJA) CTC with a larger benefit that would be available to all low and middle-income families with children regardless of earnings or income. In total, families would have received an additional $101 billion in benefits each year, more than the U.S. spends on either the Supplemental Nutrition Assistance Program (SNAP), rental housing assistance, or the Earned Income Tax Credit (EITC). Despite the magnitude of the proposed changes, the extent of prior research on a child allowance pales in comparison to what preceded the welfare reforms of the 1990s. In this paper, we help fill the research gap by examining the anti-poverty, targeting, and labor supply effects of replacing the TCJA CTC with a child allowance. We make two major innovations relative to past work: we use linked survey and administrative data to correct for the pronounced underreporting of survey incomes, and we incorporate the labor supply effects of the large changes in work incentives.

Policy interest in a child allowance has led a number of researchers to simulate its anti-poverty effects (Acs and Werner 2021; Brill, Pomerleau, and Seiter 2021; Collyer et al. 2021; Congressional Research Service 2021; Marr et al. 2021). In addition to relying solely on survey data, these studies do not incorporate labor supply reductions in response to changes in the CTC when modelling impacts on income and poverty.[1] The National Academy of Sciences (2019) analyzes the employment and hours effects of a similar policy and is often cited as evidence that the replacement of the CTC with a child allowance would have minimal employment effects.[2] However, it omits the effects on employment and poverty of eliminating the work incentives of

[1] Since the initial posting of our working paper, at least two papers (Goldin et al. Forthcoming and Bastian 2022) have responded by including labor supply responses on the participation margin.

[2] One report notes: "An expert panel convened by the National Academy of Sciences projected that under a child credit policy similar to the expanded Child Tax Credit, 99.5 percent of working parents would continue to work, and few would substantially reduce their hours" (Sherman, Marr, and Hingten 2021). Some previous studies simulating the anti-poverty effects of replacing the CTC with a child allowance cite the NAS report as a justification for not incorporating labor supply effects (e.g., Acs and Werner 2021; Collyer et al. 2021). A letter from 462 economists submitted to Congressional leaders on September 15, 2021 argues that replacing the CTC with a child allowance would lead to minimal work reduction based on the NAS report, stating: "Indeed, the panel of experts who reviewed this issue for the National Academy of Sciences concluded that a universal child allowance would have a negligible effect on employment."

the CTC, basing its calculations on a child allowance in its simplest form without pre-existing work incentives.

Furthermore, relying on surveys alone to measure income may bias estimates of the anti-poverty effects of proposed policies. Survey-reported values of income have been found to understate true incomes for both market income sources (e.g., Bee and Mitchell 2017) and government benefits (e.g., Meyer and Mittag 2019). This error can lead survey data to not only overstate the level of poverty but also understate the anti-poverty effects of existing government programs (Meyer and Wu 2018; Shantz and Fox 2018; Meyer, Wu, et al. 2021). To address the misreporting of income and other information in surveys, the Comprehensive Income Dataset (CID) links major household surveys with an extensive set of tax records and administrative government program data sources. The CID improves upon existing efforts to simulate proposed policies by calculating a more accurate distribution of baseline incomes, modeling the replacement of the CTC with a child allowance more accurately, and enabling more accurate comparisons of the child allowance to existing programs.

We first analyze the static poverty reduction effects of replacing the CTC with a child allowance, ignoring any behavioral responses. To enable a consistent comparison between the CID-based results and estimates relying on survey data alone, we set our poverty thresholds such that 13.7% of children are in poverty in our baseline. This 13.7% baseline child poverty rate is similar to that used for previous simulations of the CTC expansion and was the child poverty rate according to the Supplemental Poverty Measure in 2018. From this baseline, we find that—absent behavioral responses—child poverty would fall by 34% and deep child poverty would fall by 39% due to the change to a child allowance.

We next compare the anti-poverty effect of the change to a child allowance with those of existing government programs, again before accounting for labor supply effects. To put the programs on an equal footing, we take as our baseline a setting in which the child allowance is in place, and then simulate how much poverty would increase if a given program were eliminated. In other words, these results indicate how much poverty is avoided as a result of each program. The change to a child allowance would keep 5.8 million people (including 3.4 million children) out of poverty and become the most important program for preventing child poverty. Reverting back to the CTC would increase child poverty by 51%. Eliminating the EITC, the program with the second highest effect, would increase child poverty by 42%.

Despite its large anti-poverty effect, the change to a child allowance is less targeted to the bottom part of the income distribution than other means-tested programs. A lower share of child allowance dollars would be received by families in the bottom 10% or 50% of annual income than all other major means-tested programs (with the exception of rental housing assistance for the bottom 10%). In line with these results, the change to a child allowance keeps fewer children out of poverty—per dollar spent on families with children—than other major means-tested programs. The EITC in particular provides a larger share of benefits to families in the bottom decile of annual income (20%) than the child allowance (15%). The child allowance is also less targeted than other means-tested programs to families with low long-run market income, low educational attainment, and poor health. Yet, the child allowance is more targeted than the CTC to families with low incomes and low levels of well-being.

While the static results are useful as a baseline, it is important to account for any resulting reductions in employment. While other behavioral responses may be important, such as changes in private transfers and living arrangements, the response for which we have the best evidence is labor supply. The CTC produces strong work incentives because the credit is generally available only to parents who work. Eliminating the CTC would therefore reduce employment participation by decreasing the return to work. Replacing the CTC with a child allowance (akin to a universal basic income-type benefit for children) and increasing the maximum benefit amount would further reduce employment through an income effect. We simulate the employment effects of a change to a child allowance by relying on elasticity estimates used by the NAS, the Congressional Budget Office, and the academic literature. In particular, we rely on an employment participation elasticity of 0.75 for single mother EITC recipients, which is supported by the EITC literature and is in fact lower than that implied by some of the most notable studies (Appendix A below).

We estimate that the decreased return to work would lead 1.32 million working parents to exit the labor force, while the income effect would reduce employment by a further 0.14 million, for a total employment loss of 1.46 million workers (constituting 2.6% of all working parents). Our estimate of employment loss due to the change to a child allowance differs markedly from the corresponding estimate in a 2019 NAS report, which concludes that replacing the CTC with a child allowance similar to that proposed under the 2021 Build Back Better Act would reduce employment by 0.15 million workers (National Academies of Sciences, Engineering, and Medicine 2019). NAS (2019) obtains a much smaller employment reduction because it does not

account for the decrease in the return to work, despite accounting for such an effect when analyzing reforms to the EITC. Instead, the NAS report only estimates employment loss due to an income effect, which is similar in magnitude to our estimate of the income effect. If the NAS had applied to the CTC the methods it used to simulate changes to the EITC, it would have found an estimate larger than ours (as shown in Appendix B).

Many other authors have noted the work incentives of the CTC (and pre-existing versions), but prior research has not fully incorporated them into analyses of the effects of replacing the CTC with a child allowance. We show that this policy change embeds a change in incentives that is almost as large as that from eliminating the EITC—among all working parents with earnings below $100,000, the reduced incentive to work at all due to the change to a child allowance is 88% as large as the reduced incentive to work at all due to hypothetically eliminating the EITC. When applying our modeling approach to changes in the EITC, we find a modestly lower employment response than what NAS (2019) finds—indicating that we have been conservative in parameterizing the labor supply responsiveness of this population. Our estimates of the changes in employment are also consistent with the observed changes in the employment of single mothers in the opposite direction after welfare reform in the 1990s.

Labor force exits due to the child allowance would have important implications for the anti-poverty effect of the policy change. Allowing for behavioral responses, we estimate that the effect of the change to a child allowance on child poverty would fall from 34% based on our static simulation to at most 22% based on our dynamic simulation. Moreover, we estimate that replacing the CTC with a child allowance would have no effect on deep child poverty after allowing for labor supply responses, in stark contrast to the 39% reduction in deep poverty based on our static simulation. However, we do not model the effects of the child allowance on long-term outcomes such as health, education, incarceration, and single parenthood.

Finally, we compare static results obtained using our CID-based simulation to results obtained using only survey data. The correction for underreporting of survey income and the broadening of the income measure lead us to set poverty thresholds 40% higher than official thresholds in order to hold constant the share of children in poverty at baseline. Despite doing so, we estimate a low baseline level of deep child poverty of 2.3%—the share below half this higher threshold—that is a direct result of improvements in the measurement of income, leading to considerably fewer children in the left tail of the income distribution. Additionally, in contrast to

the static survey-only results, the static CID-based results find smaller differences between the change to a child allowance and existing programs in preventing poverty, and greater targeting of existing tax credits to families at the bottom of the income distribution. These improvements reflect the ability of the CID to more accurately measure all sources of income, including tax credits. We also compare our static results to those of prior simulations of the child allowance, which have found larger anti-poverty effects between 35% and 46% (compared to the 34% effect we find using only the survey). Our estimate is lower because we account for incomplete take-up of the child allowance by non-tax filers, and because we update incomes to a 2022 baseline. These comparisons of the survey-only and CID estimates demonstrate the important role of linked data in facilitating a wide-ranging analysis of the effects of replacing the CTC with a child allowance.

By using the CID to simulate proposed policies, our paper builds upon a growing body of research using the CID to improve the understanding of economic well-being in the United States. Other research using the CID has focused on using linked administrative data to address errors in surveys (Medalia et al. 2019; Meyer et al. 2020; Celhay, Meyer, and Mittag 2021; Meyer and Mittag 2021), measuring extreme poverty (Meyer, Wu, et al. 2021), analyzing the effect of existing programs on economic well-being (Meyer and Wu 2018; Meyer and Mittag 2019), and improving our understanding of the homeless population (Meyer, Wyse, et al. 2021). This is the first paper to use the CID to simulate the effects of proposed policies with greater accuracy than simulations based on survey data alone.

The rest of this paper proceeds as follows. Section 2 describes the parameters of the CTC and a proposed child allowance. Section 3 describes the data sources, and Section 4 describes the methodology for simulating income under the CTC and child allowance. Section 5 reports the static results, Section 6 reports the dynamic results accounting for changes in labor supply, and Section 7 discusses their implications. Section 8 concludes.

## 2. Replacing the Child Tax Credit with a Child Allowance

This section describes the CTC, the child allowance proposed in the Build Back Better Act, and how work incentives would change as a result of the replacement. The CTC is a tax credit for families with children, providing $118 billion in benefits in 2018. Unlike the EITC, the full amount of the CTC is only available as a non-refundable credit and so families must have a sufficient amount of taxable income to receive it. Lower-income families can receive a smaller refundable

portion of the credit, but—like the EITC—this refundable portion phases in with earned income, leaving families with no earned income ineligible for any benefits. In contrast, most means-tested benefits—including SNAP, rental housing assistance, and Supplemental Security Income (SSI)—provide maximum benefits to families with no income and phase out as incomes increase. The child allowance would similarly provide the maximum benefit to low-income families, but it would not phase out until incomes reach much higher levels. We describe the CTC and child allowance in more detail below, followed by a discussion of their differing work incentives.

**Child Tax Credit**

Under the Tax Cuts and Jobs Act (TCJA), the CTC offers tax filers a credit of up to $2,000 per dependent child under age 17, with up to $1,400 being refundable. The refundable portion of the CTC (called the Additional CTC or ACTC) does not require tax filers to have any federal income tax liability. It begins phasing in at $2,500 of earned income, at a rate of $0.15 per dollar of earned income.[3] A maximum of $1,400 per dependent child can be claimed as a refundable credit, and the remaining portion of the maximum $2,000 credit must be claimed as a non-refundable credit that offsets federal income tax liability. In Figure 1a, the solid line shows the credit amount as a function of earnings for a family headed by a single parent with two children. The CTC phases out at a 5% rate beginning at $200,000 of taxable income for single filers and $400,000 for married filers. An additional $500 credit (called the Credit for Other Dependents or ODC) can be claimed on behalf of dependents aged 17+ who are not eligible for the $2,000 credit. The ODC is non-refundable and phases out at the same rate as the non-refundable CTC for dependents under age 17.

The TCJA CTC itself expanded the pre-TCJA CTC benefit. Prior to the implementation of TCJA for the 2018 tax year, the CTC was capped at $1,000 per child (with a lower refundable portion). The TCJA version of the CTC is set to expire after 2025, at which time this older version of the CTC would again take effect absent legislative action.

[3] For example, a tax filer with one dependent child, no tax liability and $3,500 of earned income would receive a refundable credit of $150 (15% of the difference between $3,500 and $2,500).

## Child Allowance

On March 11, 2021, President Biden signed the American Rescue Plan Act into law. Among other provisions, the law temporarily replaced the CTC with a child allowance for 2021 only. In April 2021, the Biden Administration proposed extending the child allowance through 2025 as part of the American Families Plan, which was subsequently incorporated into the Build Back Better Act.[4] The child allowance would increase the maximum per-child credit from $2,000 for all children under age 17 to $3,600 for children aged 0 to 5 and $3,000 for children aged 6 to 17. It would also be fully refundable, meaning families with little or no tax liability would qualify for the entire amount. Notably, children aged 17 would qualify for the full $3,000 under the child allowance, whereas they are only eligible for the ODC (up to $500) under the CTC. In Figure 1a, the dashed line shows the child allowance amount as a function of earnings (it is constant) for a family headed by a single parent with two children. The higher maximum payment would begin to phase out starting at $75,000 for single filers, $112,500 for head of household filers, and $150,000 for married filers. The $2,000 credit would still be available to higher-income tax filers for whom the child allowance has fully phased out relative to the CTC. See Appendix Table A1 for the full set of parameters under the CTC and child allowance.

In addition to changing benefit amounts, the child allowance would be administered differently from the CTC (assuming it follows the rules implemented under the American Rescue Plan Act). Families would receive child allowance payments on a monthly basis (as they currently do for most means-tested programs), and they could update eligibility information (e.g., the birth of a new child) throughout the year.

## Changes in Work Incentives Due to the Child Allowance

Since it is fully refundable, the child allowance would eliminate the work incentives of the CTC. We focus on the return to work—what is relevant for the work participation decision—because the literature on labor supply for low-income families, particularly single mothers, has focused on the work/non-work decision and found it to be highly responsive to tax incentives. The return to work is equal to earnings net of taxes and reduced transfer benefits when an individual

[4] The American Families Plan would have additionally expanded early childhood education, offered free tuition at community colleges, expanded Pell grants, expanded the EITC for childless workers, and expanded the Child and Dependent Care Tax Credit (CDCTC)—among other provisions.

moves from not working to working. The return to work would be lower under the child allowance because families with no earnings would receive the full benefit, whereas such families would receive no benefit from the CTC.

To be precise, the change in the return to work due to replacing the CTC with a child allowance can be written as the return to work under the child allowance minus the return to work under the CTC. Specifically, the return to work under a given policy is equal to income given current earnings $E^*$ (or more generally the earnings an individual would receive if she chose to work) minus income with zero earnings:

$$Change\ in\ Return\ to\ Work = \underbrace{[Income_{CA}(E^*) - Income_{CA}(0)]}_{Return\ to\ work\ under\ Child\ Allowance} - \underbrace{[Income_{CTC}(E^*) - Income_{CTC}(0)]}_{Return\ to\ work\ under\ CTC}$$

Since the child allowance does not affect tax liability or transfer benefits,[5] all non-CTC components of the return to work are the same under the child allowance and CTC and thus drop out of the expression above. We can therefore rewrite the expression as:

$$Change\ in\ Return\ to\ Work = [Child\ Allowance(E^*) - Child\ Allowance(0)] - [CTC(E^*) - CTC(0)]$$

For most individuals, the value of the child allowance does not depend on earnings and so $Child\ Allowance(E^*) = Child\ Allowance(0)$. Also, $CTC(0)$ can be assumed in most cases to be zero, because one needs positive earnings (or positive tax liability from unearned income) to receive the CTC. Thus, the decrease in the return to work for most working parents is simply the amount of the CTC given current earnings, $CTC(E^*)$.

Figure 1b illustrates the CTC benefit schedule—equaling the decrease in the return to work due to its replacement with a child allowance—for a single parent with two children under age 17. Her return to work falls by $2,000 if she currently earns approximately $16,000. Her return to work falls by $4,000 if she currently earns $31,000. For comparison, Figure 1b also shows how

[5] Because the non-refundable portion of the CTC is applied *after* the Child and Dependent Care Tax Credit (CDCTC) and Credit for Other Dependents (ODC), the child allowance would not enable the individual to claim an additional amount of these non-refundable credits. The child allowance does not affect benefit determinations for transfer benefits.

another tax credit, the EITC, affects the return to work for the same family type. The EITC is widely recognized to encourage work, doing so by increasing the share of single parents who work at least some hours in a year (Hotz and Scholz 2003; Nichols and Rothstein 2016). Beyond a low earnings level, the subsidy to work under the CTC that would be lost with the reform is a substantial share of the EITC subsidy, finally exceeding the EITC subsidy at just under $30,000 of earnings. The CTC subsidy to work remains flat at $4,000 as income rises, while the EITC subsidy falls and reaches zero at $47,440. Others have noted the common feature of the EITC and CTC in encouraging work among parents (e.g., Holt and Maag 2009; Greenstein 2015; Hoynes and Rothstein 2016; Moffitt 2016).

As shown in Appendix Figure A1, the decrease in the return to work is higher for individuals on the phase-out portion of the child allowance such that $Child\ Allowance(E^*) < Child\ Allowance(0)$. In the case of a single parent with two children, the child allowance amount phases out at earnings levels between $112,500 and $164,500, at which point it reverts to the CTC amount. At this point, $Child\ Allowance(E^*) = Child\ Allowance(E^*)$, and so the change in the return to work is the full child allowance amount when not working, i.e., $Child\ Allowance(0)$. This amount is equal to $6,600 for a single parent with two children aged 5 and 10.

To see the change in work incentives for the entire distribution of working parents in the United States with annual earnings up to $100,000, Figure 2 (solid line, top panel) shows the average percent change in the return to work due to the change to a child allowance for working parents with different levels of earnings. For each working parent, we calculate the percent change in the return to work as the change in the return to work due to the change to a child allowance divided by the return to work under TCJA. We then calculate the mean percent change in the return to work over all working parents in each earnings bin. Here we are averaging over families of different sizes and with different ages of children, and we are accounting for other government benefits (namely SNAP) that individuals receive. As an example, the change to a child allowance would decrease the return to work by 10% for workers with earnings between $30,000 and $40,000. For comparison, Figure 2 (dashed line, top panel) shows the percent change in the return to work due to hypothetically eliminating the EITC, which is the actual EITC benefit received by the worker divided by the return to work under TCJA. For example, eliminating the EITC would decrease the return to work by 8% for workers with earnings between $30,000 and $40,000. We

also show, in the lower panel, the total number of workers with children in tax units in the different earnings ranges.

While eliminating the EITC would create stronger work disincentives for working parents with the lowest earnings, work disincentives from replacing the CTC with a child allowance would nonetheless be important for low earners. The work incentives of the CTC are 40% percent of EITC work incentives for those with earnings between $10,000 and $20,000 (representing 9% of all working parents), and 65% of EITC incentives for those between $20,000 and $30,000 in earnings (representing another 9% of all working parents). For working parents with earnings above $30,000, the work disincentives of the change to a child allowance would be greater than those due to eliminating the EITC. For those with earnings between $30,000 and $40,000 (representing 9% of all working parents) and those between $40,000 and $50,000 (representing 7% of all working parents), the CTC incentives are 30% and 203% higher than the EITC incentives, respectively. Among the 39% of working parents with earnings below $50,000, the CTC incentives are 62% of the EITC incentives, and among the 66% of working parents with earnings below $100,000, the CTC incentives are 88% of the EITC incentives. In sum, if one believes that eliminating the EITC would substantially reduce employment by reducing the return to work, then replacing the CTC with a child allowance should substantially reduce employment for the same reason.

# 3. Data

We use the 2017 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) for our survey-only analyses (United States Census Bureau 2017). Fielded between February and April 2017, the 2017 CPS ASEC asks respondents about incomes received during calendar year 2016. We do not use a more recent version of the CPS ASEC due to the wider availability of administrative data sources for calendar year 2016. The CPS ASEC contains a wide variety of questions on income sources and amounts, and it includes an extensive set of demographic information on respondents that is unavailable in most administrative sources. The Census Bureau uses the CPS ASEC to produce its annual official poverty measure, supplemental

poverty measure, and historical median income series (Fox and Burns 2021; Shrider et al. 2021). Other simulations of a child allowance have also relied on the CPS ASEC.

For the CID-based simulation, we link the 2017 CPS ASEC to a large set of administrative data sources at the individual level. The linked data improve the accuracy of measures of earnings, pension income, Social Security benefits, cash welfare, food assistance, housing assistance, and taxes. Administrative data on earnings come from individually linked Internal Revenue Service (IRS) Forms 1040s and W-2s, as well as the Social Security Administration's Detailed Earnings Record (DER). Given the incompleteness of the administrative records in capturing all earnings sources such as off-the-books work, we take the higher of earnings amounts in the DER, W-2s, and 1040s and continue to use survey earnings that exceed combined administrative earnings if they reflect earnings that are plausibly missed in the tax records.[6] We also obtain more accurate values of asset income and retirement income from IRS Forms 1040s and 1099-Rs, which we use to directly replace survey values. Furthermore, we are able to use values of Adjusted Gross Income (AGI) from IRS Forms 1040 to provide a lower bound for other sources of money income such as Unemployment Insurance, child support, and alimony.

Because we observe tax units, claimed dependents, and AGI—among other relevant tax inputs—we can accurately impute federal and state income tax liabilities and payroll tax liability. We use NBER's TAXSIM calculator to impute taxes using the precise inputs provided on tax forms (Feenberg and Coutts 1993). The linked tax data help to correct for large survey errors in tax liabilities and credits (Jones and Ziliak 2020; Meyer et al. 2020). In the specific context of this paper, we are able to accurately model the child allowance proposed by the Build Back Better Act by using actual tax unit structure, tax filing status, and AGI from IRS Forms 1040 and the exact birth dates of dependents from the SSA's Numident file (as these factors affect both eligibility and benefits levels of the proposed child allowance).

We also link administrative data covering various government program benefits. We link administrative data on Old Age, Survivors, and Disability Insurance (OASDI) from the SSA's

[6] Specifically, we bring in survey earnings if they are not imputed, if employment characteristics (hours/weeks worked, industry of job, job occupation, and employer size) are not imputed, and if one of the following conditions holds: 1) earnings are missing across all tax records, 2) the number of survey-reported employers exceeds the number of employers in the tax records, 3) the survey respondent reports being self-employed, or 4) the survey respondent reports working for a small employer. Prior work has found that these situations constitute a minority of cases where survey earnings exceed administrative data earnings (Meyer, Wu, and Medalia 2020).

Payment History Update System (PHUS) and the Master Beneficiary Record (MBR), and Supplemental Security Income (SSI) from SSA's Supplemental Security Record (SSR).[7] We link rental housing assistance benefits from the U.S. Department of Housing and Urban Development's (HUD) Public and Indian Housing Information Center (PIC) and Tenant Rental Assistance Certification System (TRACS) data, which cover all mainstream HUD programs—public housing, Housing Choice Vouchers, and project-based assistance.[8] We also link SNAP data from a select subset of states for which we have administrative data, which we use for a subset of the analyses.

We link these data sources using anonymized Protected Identification Keys (PIKs) created by the Census Bureau's Person Identification Validation System (PVS; Wagner and Layne 2014). The PVS maps individuals to PIKs based on Social Security numbers, names, addresses, and dates of birth. Over 99% of administrative records are associated with a PIK, while a lower share of records in 2017 CPS ASEC are associated with a PIK.[9] This allows us to merge in administrative data for the vast majority of the CPS ASEC sample. We drop from the sample any family in which no member has an associated PIK as well as whole-imputed families. We then use inverse probability weighting to scale up the weights of the remaining individuals in the sample who are similar in terms of observable characteristics to dropped individuals.[10]

# 4. Methodology

We describe our methodology in two parts. First, we describe how we construct baseline income. Second, we describe how we calculate the CTC (which is a component of baseline income) and the child allowance.

[7] To expedite Census Bureau review, we do not include administrative values for service-connected disability payments to veterans from the U.S. Department of Veterans Affairs (as we have in other projects).
[8] Since our HUD administrative data do not cover all forms of rental housing assistance—omitting U.S. Department of Agriculture (USDA) programs, the Low Income Housing Tax Credit (LIHTC), and state and local programs—we treat survey respondents reporting housing assistance receipt who not appear in the HUD data as true recipients (and impute amounts based on average benefit amounts by household size, zip code, and year bins from the HUD data).
[9] In the years for which PIK rates have been made publicly available, more than 90 percent of CPS ASEC families and households are PIKed (Meyer and Mittag 2019; Meyer, Wu, et al. 2021; Meyer and Mittag 2021).
[10] In the end, our analysis sample (covering individuals in PIKed and non-whole imputed families) contains 77.3% of all individuals in the original CPS sample.

**Constructing Baseline Income**

For the survey-only version of baseline income, we use a post-tax, post-transfer income measure that includes non-medical in-kind transfers—namely, rental housing assistance, SNAP, school lunch, WIC, and energy assistance (all imputed by the Census Bureau). We subtract federal and state income tax liabilities net of tax credits and payroll taxes imputed using TAXSIM based on tax rules under TCJA that did not take effect until 2018.[11] Like other simulations, we assign refundable tax credits including the CTC based on the tax year for which credits are accrued, rather than the following year when the credits are mostly received. The CID-based version of baseline income uses the same post-tax, post-transfer definition of income, but it also incorporates administrative data whenever available. For income sources for which we do not have administrative data—including Public Assistance (largely Temporary Assistance for Needy Families (TANF) or General Assistance), school lunch, WIC, and energy assistance—we continue to use the survey values.

The sharing unit for both the survey-only and CID versions of baseline income is the Supplemental Poverty Measure (SPM) family unit.[12] We equivalize incomes using the NAS (Citro and Michael 1995) equivalence scale of the form $(A + PK)^F$, where $A$ and $K$ respectively designate the number of adults and children in the family, $P$ is child consumption as a share of adult consumption, and $F$ reflects economies of scale.[13] Because we are interested in the effects of the child allowance in 2022 (the first year of its proposed enactment), we use 2016 incomes as a starting point to project 2022 incomes. To do so, we increase market income by the C-CPI-U (the same index used to update thresholds for tax brackets under TCJA) and we increase OASDI and SSI amounts by the CPI-W (the same index used by rule to update benefit amounts). For most

[11] We subtract neither medical out-of-pocket expenses nor child care and work expenses from income (as the SPM does). Meyer and Sullivan (2012b) find that subtracting medical out-of-pocket expenses leads the SPM to identify a less deprived poor population. While deducting work expenses from resources is a reasonable goal, it is not clear that the imputed values in the CPS ASEC—which are used for the SPM—lead to a poverty measure that better identifies the most disadvantaged.

[12] The SPM family unit includes related individuals, cohabitating unmarried couples, unrelated children under 15, and foster children under the age of 22.

[13] Following Meyer and Sullivan (2012a), we set $P = F = 0.7$ to allow for diminishing marginal costs with each additional individual and a larger cost of adults relative to children.

other means-tested benefits, we increase amounts based on changes in scheduled maximum benefits.[14] See Appendix Table A2 for how each specific benefit amount is updated to 2022.[15]

**Calculating the Child Tax Credit and Child Allowance**

In the survey-only version of baseline income, we use the CTC benefit calculated by TAXSIM on the basis of survey information. We calculate the child allowance benefit outside of TAXSIM on the basis of imputed tax unit information in the CPS ASEC, according to the parameters set forth in the Build Back Better Act (described earlier). The CID has multiple advantageous features that allow us to more accurately impute both the CTC and child allowance. One important advantage is that we can use the information on 1040s such as AGI, number of claimed dependents, and other items to more accurately calculate credit amounts.

Another advantage of the CID is that it allows us to observe the identities of dependents claimed on 1040s. This enables us to determine the amount of the CTC or child allowance claimed on behalf of each child, even if the child does not live in the same family as the adult who claims them. Previous studies relying only on survey rosters have necessarily assumed that tax units are formed only by people within the family or household, neglecting the possibility of complex families. We calculate that there are 6.1 million children in the 2017 CPS ASEC (8% of all children in the survey) who are claimed on a 1040 by primary and secondary filers who do not appear in the survey family of the child.[16]

Our approach to accounting for complex families is to assume all non-CTC taxes and tax credits are paid or received by the adults in a sharing unit, since they have legal control of the money and in general make the actual payments and receive any refunds. However, in the case of

[14] Technically, benefits will not increase by the same rate as the change in maximum benefits for those receiving less than the maximum benefit. For example, the change in the SNAP benefit for a given family is equal to the change in the maximum benefit minus approximately 0.3 times the change in the family's net income. We instead update by the percent change in maximum benefits for the sake of simplicity and so our multipliers can be shared without relying on the restricted-use microdata.

[15] The total population, child population, and number of working parents will also be different in 2022 than in 2016. If annual growth rates from 2016 to 2020 hold for 2021 and 2022, the total population will be 2.7% higher in 2022 than in 2016 and the child population will be 2.6% lower. The employment to population ratio may be similar depending on the recovery from the COVID-19 induced recession. In January 2016, the employment to population ratio was 59.7%, and by August 2021 it had recovered to 58.5% after hitting a trough of 51.3% in April 2020. Accounting for changes in the number of children would decrease our estimated number of children lifted out of poverty by 2.6%, and accounting for changes in the number of working parents could slightly increase or decrease the number of working parents exiting the labor force depending on employment trends into 2022.

[16] We also frequently observe surveyed adults who claim on their 1040s children outside of the survey family, though we do not observe survey weights for these children because they are not generally in the survey.

the CTC and child allowance, we associate dollars with the children on whose behalf the benefits are claimed. An advantage of this approach is that the surveyed children are those for whom we have the most detailed information from both survey and linked administrative data, and they are appropriately weighted. A disadvantage is that all CTC and child allowance benefits claimed on behalf of children who appear outside of the survey frame (e.g., living abroad, in institutions, etc.) would not be captured in our simulations. However, it is worth noting that existing research—without the benefit of the CID—also misses those children and implicitly assumes that all dependents in a survey can only be claimed by individuals in their family. We improve on existing research by assigning the correct value of the CTC or child allowance based on the 1040 on which dependents are actually claimed (and whose primary/secondary filers may or may not appear in the survey). In Appendix C, we describe our methodology for allocating benefits to complex families—in cases where surveyed adults claim children outside of the surveyed adult's family, and in cases where surveyed children are claimed by adults outside of the surveyed child's family.[17]

A final issue for calculating child allowance amounts is that not all eligible families may take up the benefit. We assume all tax filers claim the child allowance because they automatically receive the payments.[18] Eligible non-filers do not automatically receive child allowance payments, but we may expect a high rate of take-up. Benefit amounts are relatively high and eligibility rules are simple and transparent. Receipt of the child allowance (based on the rules under the American Rescue Plan Act) does not require filing taxes and requires no documentation.[19] There is likely to be little stigma associated with the child allowance because the vast majority of families in the U.S. receive the benefit. Nonetheless, there may be information frictions that could diminish take-up especially in the early years of the child allowance, which have been found in other programs (Daponte, Sanders, and Taylor 1999; Manoli and Turner 2014; Armour 2018).

[17] An alternative approach would be to add non-surveyed dependents listed on the tax returns of a surveyed adult to the surveyed adult's sharing unit. This approach has some merit. However, we would bring in benefits for children who are not in the survey, while dropping those in the survey who appear on the returns of someone outside the survey unit. This would effectively be building a new frame of children based on a hybrid of survey and tax information that would make our results hard to compare to survey-based estimates. Such a hybrid frame would require new ways of conceiving the sample and possible new weights that would rely on assumptions that are difficult to verify.

[18] For the CID-based simulation, non-filers are those families to whom we (i) do not a link a 1040 and (ii) do not simulate a non-zero tax liability or have refundable tax credits of at least $500 (using survey information).

[19] The signup form can be completed online and requires only minimal information—name, mailing address, email address, date of birth, and Social Security numbers for the adult and dependents. See Appendix Figure A2 for an image of the sign-up website for the child allowance under the American Rescue Plan Act.

We assume a baseline take-up rate among non-filers of 75%. We also show our total and child static poverty effects under other assumptions on the take-up rate, including 0%, 25%, 50%, and 100%. For reference, take-up of the EITC is estimated to be 78% (Internal Revenue Service 2021c), and take-up of SNAP is estimated to be near complete among families eligible for the full SNAP benefit (Vigil 2019), which is similar in magnitude to the child allowance benefit for families with little income (Appendix Figure A3). In addition, Acs and Werner (2021) assume a 78% take-up rate among non-filers who also do not receive SSI or OASDI benefits. Other simulations of the child allowance (Collyer, Wimer, and Harris 2019; Collyer et al. 2021; Congressional Research Service 2021; Marr et al. 2021) assume 100% take-up among non-filers (see Appendix Table A3). Our incomplete take-up assumption also accounts for the relatively small number of unauthorized immigrant children in the CPS ASEC who are not eligible for the child allowance, and thus should not be assigned child allowance benefits.[20]

# 5. Static Results

In this section, we report a series of results on the static effects of replacing the CTC with a child allowance. We start by reporting aggregate recipients and dollars. We then report the effects of the child allowance on poverty rates (as well as deep and near poverty rates) for the full population and child population, providing a baseline for our dynamic simulation. Finally, we analyze how the anti-poverty effect of the change to a child allowance compares to those of existing programs, as well as its targeting to different groups based on income and various well-being measures.

### Aggregate Recipients and Spending

Table 1 reports the number of recipients and aggregate benefit dollars for the CTC and child allowance. While our simulation year is 2022, we first compare benefit dollars under the CTC in 2018 based on the CID to the administrative total from the IRS Statistics of Income (SOI) report. A comparison of our total CID-based benefit dollars with total SOI dollars provides a check on the accuracy of our CID-based estimates. According to the SOI report, $117.7 billion of CTC

[20] A Pew study estimates that there are 675,000 unauthorized immigrant children in the U.S. in the CPS ASEC (Passel and D'Vera 2018). Using the CID-based CPS ASEC, we find that there are 473,000 weighted children under age 18 who are (i) not linked to a Social Security number, (ii) Hispanic, (iii) not a citizen, and (iv) born outside of the United States who are covered by the survey.

benefits were paid out for tax year 2018. We estimate that $110.2 billion of CTC benefits were paid out to the CPS ASEC universe based on the CID, constituting 94% the SOI aggregate. This difference is likely explained by our estimate that the CPS captures approximately 95% of all children who can be claimed as a dependent on a 1040. The deviation from 100% can be mostly explained by children who are living abroad (and thus not in the CPS survey frame) or not represented in the CPS ASEC population benchmark due to an undercount of the non-institutionalized population.[21]

The other panels of Table 1 update incomes for 2022 and report the number of recipients and benefit dollars under the CTC, the child allowance, and their difference. Based on the CID, we find that replacing the CTC with a child allowance increases the number of children living in a family receiving any benefit by 4.4 million. The change to a child allowance also increases total benefits paid by $101.3 billion (from $111.8 billion under the CTC to $213.1 billion under the child allowance). The increase in spending due to the policy change is $3.0 billion higher under the CID than under the survey-only simulation.

**Static Poverty Reduction Effects of Replacing the CTC with a Child Allowance**

We next estimate the poverty reduction effects of replacing the CTC with a child allowance without accounting for behavioral effects. We set our poverty threshold such that 13.7% of the child population in 2022 is in poverty (i.e., we set the threshold equal to the 13.7$^{th}$ percentile of equivalized family income among children). We choose 13.7% because it is the baseline child poverty rate used for simulations of the child allowance in several other studies, and because it was the child poverty rate according the Supplemental Poverty Measure in 2018.[22] To maintain the same 13.7% share of children in poverty at baseline in both simulations, the poverty threshold for a family of four using the CID is $37,890—14% higher than the $33,229 poverty threshold using the survey data only. The higher threshold using the CID reflects underreporting of income in the survey data. The static effect of the child allowance on poverty is equal to the percent of the poor population whose income is raised above the poverty thresholds after incorporating the child

[21] See Appendix D for more information on the discrepancy between the number of children represented by the CPS ASEC and the number of children who can potentially be claimed as a dependent for purposes of the CTC and child allowance—and the implications for our aggregate estimates of CTC and child allowance spending.

[22] We do not geographically adjust thresholds across areas, recognizing that high housing costs in some areas can reflect higher quality amenities such as higher quality schools, better transportation, and health care (Meyer, Wu, and Curran 2021).

allowance in family income. We also consider effects on deep poverty (below 50% of the poverty threshold) and near poverty (below 150% of the poverty threshold).

Table 2 reports poverty effects of changing to a child allowance for both the full population and the child population. Using the CID, the overall poverty rate falls from 10.8% to 9.0%, a 17% reduction. Child poverty falls from 13.7% to 9.1%, a 34% reduction. Using the survey data only, overall and child poverty fall by 16% and 34%, respectively. The similarity of the CID and survey-only results are consistent with the similar increases in aggregate spending across the two approaches seen in Table 1. Deep poverty—for which the CID-based threshold is $18,945—falls by 39% among all children (Table 2). On the other hand, near poverty—for which the CID-based threshold is $56,835—falls by 11% among all children (Table 2).

Despite raising poverty thresholds 40 percent above official thresholds when using the CID, it is worth noting that the baseline level of deep child poverty remains strikingly low at 2.3%. It is on this low baseline rate that we estimate a 39% reduction in deep child poverty as a result of the change to a child allowance. The low levels of deep poverty are a direct result of improvements in the measurement of income, which include using administrative data to correct errors in survey reports of income and broadening the resource measure to account for tax liabilities and credits as well as non-medical in-kind transfers. These adjustments lead to considerably fewer children in the left tail of the income distribution—echoing the findings in Meyer, Wu, et al. (2021), who find sharp reductions in the prevalence of extreme poverty (defined as $2/person/day) after various improvements to the measurement of income. Notably, the low level of deep child poverty persists despite excluding administrative values for income sources such as SNAP and TANF, which are targeted to families with children and heavily underreported in the survey.

We consider the robustness of our static poverty reduction estimates to alternative assumptions of take-up of the child allowance among non-filers (Appendix Table A4). At one extreme, the child poverty reduction grows from 34% to 36% after assuming that all non-filers take up the child allowance. At the other extreme, child poverty would still fall by 30% even if no non-filers take up the child allowance. Thus, while the poverty reduction effects vary based on the take-up assumption, they are in a fairly tight range and the overall effects would be large regardless of the ultimate take-up rate. Finally, because our survey-only results differ from those of several other studies simulating the same child allowance (Acs and Werner 2021; Brill, Pomerleau, and Seiter 2021; Congressional Research Service 2021; Marr et al. 2021), we assess the extent to which

different aspects of our methodology drive the differences. When we make methodological decisions closer in line with these studies in our survey-only analysis, we find percent reductions in child poverty within 2 to 3 percentage points of their estimates (see Appendix Table A5 for our results when adopting the methodological assumptions of other studies).[23] The differences are mostly a result of our updating income values to 2022 and accounting for incomplete take-up of the child allowance among non-tax filers.

**Static Anti-Poverty Effects of the Child Allowance Compared to Existing Programs**

Next, we compare the anti-poverty effect of replacing the CTC with a child allowance to that of existing programs. To put all programs on an equal footing, we consider a new baseline in which the child allowance has already been enacted and then simulate how much poverty would increase if a particular program were eliminated. In this case, the anti-poverty effect of each program is equal to the percent *increase* in the number of individuals with incomes falling below the poverty threshold after removing a particular program. This calculation indicates the extent to which a program prevents individuals from falling into poverty.

The change to a child allowance, if enacted, would become the most important anti-poverty program for preventing child poverty (Figure 3). Reverting from the child allowance back to the CTC would increase child poverty by 51%.[24] Eliminating the second most important program, the EITC, would increase child poverty by 42%. Eliminating SNAP would increase child poverty by 33%. Anti-poverty effects of rental housing assistance, SSI, DI, OASI, and Public Assistance are smaller. The change to a child allowance would also become the second most important program for preventing overall poverty: Reverting back to the CTC would increase overall poverty by 20%, while eliminating OASI would increase overall poverty by 57%.[25] If we were to account for changes in labor supply in these calculations, the anti-poverty effect of the change to a child

[23] To compare our results to those in other studies, we make several changes to our methodology that include (i) assuming a 100% take-up rate, (ii) not updating incomes to 2022, (iii) subtracting medical out-of-pocket expenses, child care, other work-related expenses, and child support paid, and (iv) using SPM thresholds scaled up to produce the same baseline child poverty rate as the study in question. The latter two changes are based on the use of the SPM by these other studies. See Meyer and Sullivan (2012b) and Burkhauser et al. (2021) for a discussion of the shortcomings of the SPM for accurately measuring poverty.

[24] This estimate contrasts with the 34% decrease in child poverty (as a result of the change to a child allowance) that we previously calculated, since it is estimated on an income base that includes the child allowance (whereas the previous effect is estimated on an income base that includes only the CTC). As a result, the 51% effect is approximately equal to 0.34 divided by 1 minus 0.34.

[25] Appendix Table A6 reports the values represented in Figure 4.

allowance, SNAP, and other means-tested programs would likely be lower, because they discourage employment. The anti-poverty effect of the EITC and the CTC may be higher, because they encourage employment on the extensive margin.

While the change to a child allowance would have a larger anti-poverty effect among children than any other means-tested program, it would do so in the least cost-effective way (see Appendix Table A7). Costs are measured solely in terms of total benefit dollars paid out and do not include administrative costs, which tend to be lower for programs that are administered through the tax system (like the EITC and CTC).[26] The change to a child allowance pays out $29,680 to families with children per child lifted out of poverty, compared to $15,655 for SNAP, $20,636 for the EITC, $25,504 for SSI, and $24,863 for housing assistance. The child allowance is less cost-effective in reducing overall poverty than existing means-tested programs. The change to a child allowance pays out $17,602 to all families per individual lifted out of poverty, compared to $12,312 for SNAP, $13,168 for the EITC, $17,575 for SSI, and $16,583 for housing assistance. If we were to account for changes in labor supply, the cost-effectiveness of the child allowance and SNAP would likely fall, while the cost-effectiveness of the EITC may rise.

Comparing the CID-based results to those relying only on the survey reveals the importance of using the CID to assess the anti-poverty effects of potential policies. For example, the effect of SNAP on child poverty is 53% higher using the CID than using the survey alone (Figure 3). The effect of the EITC on child poverty is 18% higher under the CID. Thus, the survey data alone overstate the relative merits of replacing the CTC with a child allowance since they understate the poverty reduction of other anti-poverty programs.

**Targeting**

We also compare the targeting of the change to a child allowance to that of existing programs. Again, we use incomes after the child allowance is enacted as our baseline (to put all programs on an equal footing). We focus on the change to a child allowance (as the most currently relevant decision for policymakers is whether or not to replace the CTC with a child allowance), but we also report results for the child allowance in its entirety and the CTC on its own. For each program, we calculate the share of all program dollars received by families in (i) each decile of

[26] At the same time, lower administrative costs may be associated with higher rates of non-compliance given that there are fewer resources available to verify recipient eligibility (see, e.g., Liebman 1998; Meyer 2010).

annual post-tax post-transfer income, (ii) each decile of long-term income (five-year average of market income using linked tax records), (iii) different categories of educational attainment levels of the family head, and (iv) different categories of health status of the family head. This analysis allows us to view how each program is targeted on the basis of different measures of well-being.

Figure 4 reports the share of each program's total spending received by families in each decile of the annual income distribution (where deciles are based on income under the child allowance so that programs are compared on an equal footing). The change to a child allowance distributes a lower share of its dollars to the bottom decile than any existing means-tested program, with the exception of housing assistance: 15% of its dollars go to families in the bottom income decile, compared to 20% of EITC dollars, 29% of SNAP dollars, and 33% of SSI dollars.[27] The change to a child allowance also distributes a smaller share of dollars to families in the bottom half of the distribution (the lowest five deciles) than all other means-tested programs (including housing assistance). Yet, the change to a child allowance pays out a larger share of its total dollars to the bottom decile and bottom half of the income distribution than the CTC. CID-based results differ from survey-only results, with the survey-only simulation indicating that the change to a child allowance targets families in the bottom decile more than the EITC (Appendix Figure A4).

We report targeting results based on other measures of well-being in Figure A5 (long-run income), Figure A6 (educational attainment of the family head), and Figure A7 (self-reported health status of the family head). Consistent with the results based on annual income, the change to a child allowance is also less targeted to the least well-off families on the basis of these other measures (compared to other means-tested transfers).

# 6. Dynamic Results Accounting for Changes in Labor Supply

This section incorporates labor supply responses into our poverty estimates, using the CID. Replacing the CTC with a child allowance would reduce the incentive to work for most workers with children. Under the CTC, workers receive up to $2,000 per child only if they work or have a nonzero federal tax liability due to income from other sources. Under the child allowance, workers receive no *additional* benefit amount as a result of working. In addition to reducing the return to work, the change to a child allowance would increase family incomes, further reducing

[27] The estimates for SNAP are calculated using the subset of 14 states for which we have linked administrative data on SNAP.

employment through an income effect. Due to the resulting reduction in employment (and its impact on family income), we estimate that some families will be added to poverty rolls in our dynamic simulation of the child allowance.

**Changes in Labor Supply**

To estimate the reduction in labor force participation due to the change to a child allowance, we apply work participation elasticities from the literature, which indicate the percent change in the probability of participation due to a one percent change in the return to work. Letting $\epsilon$ denote the participation elasticity, the percent change in the probability of working is equal to $\epsilon$ times the percent change in the return to work. We consider the work decisions of each tax unit with at least one current worker and at least one dependent child under the age of 18.

We start by calculating the percent change in the return to work for each tax unit, which is the change in the return to work due to the change to a child allowance divided by the current return to work under the CTC. The change in the return to work is the child allowance benefit (net of the CTC benefit) when working at the current earnings level minus the child allowance benefit (net of the CTC benefit) when not working, as described in Section 2. The current return to work under the CTC is current earnings minus the additional tax liability accrued due to working minus the transfer benefits lost due to working.

To calculate the percent change in the probability of working for each tax unit that is currently working, we multiply the percent change in the tax unit's return to work by the relevant elasticity for the tax unit. We apply an elasticity of 0.75 for single mother tax units currently receiving the EITC and 0.25 for all other tax units. The 0.75 elasticity for single mother tax units receiving the EITC is equal to the midpoint of the 0.3 to 1.2 range recommended for EITC-eligible workers based on the literature review relied on by the CBO (McClelland and Mok 2012), and it falls toward the lower end of the 0.7 to 1.0 range reported by the more recent Nichols and Rothstein (2016) literature review.[28] Our assumed elasticity is also lower than that found in some of the most recent and/or notable studies in the literature (see Appendix A). The 0.25 elasticity is consistent

[28] In reviewing the literature on EITC expansions during the 1990s, Nichols and Rothstein (2016) further note: "Given the clear patterns in the 1990s, it is not surprising that studies based on the 1993 expansion indicate that the EITC raises single mothers' employment rates. Meyer and Rosenbaum (2001) find that this expansion raised single mothers' annual employment rates by 3.1 percentage points, over one-third of the total increase relative to single childless women between 1992 and 1996. This implies an extensive-margin labor supply elasticity around 0.7."

with those used by other simulation models and the academic literature (Congressional Budget Office 2012; Chetty et al. 2013).[29] As we show later, our elasticity assumptions produce employment effects consistent with the NAS (2019) simulation of an expansion of the EITC.

In addition to the effects of a decreased return to work, the increase in incomes due to replacing the CTC with a child allowance would be expected to further reduce labor force participation through an income effect. To estimate the reduction in labor force participation due to higher incomes, we apply elasticities that indicate the percent change in the probability of participation due to a one percent change in income. We follow NAS (2019) in their simulation of a child allowance, which uses an elasticity of -0.085 for single-mother tax units. We assign an elasticity of -0.05 for all other tax units.[30] We multiply these elasticities by the increase in income due to the change to a child allowance divided by income under the CTC for the tax unit's family.

To estimate the total number of current workers exiting the labor force due to the change to a child allowance, we multiply each individual worker's weight in the CPS ASEC by the percent change in the probability of the worker exiting the labor force, either due to the decrease in the return to work or to higher incomes. We sum these products over all workers with children in the CPS ASEC to estimate the number of current workers exiting the labor force. See Appendix E for further details of our methodology.

We report changes in work incentives and employment for workers based on the earnings of their tax unit, in intervals of $10,000. We estimate that there were 56 million adults with children who worked during the year and were a member of a tax unit with nonzero earnings (Appendix Figure A8). Of those adults, 23% (13 million) had tax unit earnings of less than $30,000, and 43% had tax unit earnings of between $30,000 and $100,000. For workers with earnings between $30,000 and $100,000, the mean return to work falls by approximately $2,900 to $3,300 (Appendix

[29] The Penn Wharton Budget Model assumes a baseline labor supply elasticity of 0.50 (combining participation and hours). CBO (2012) recommends a labor supply elasticity of between 0.22 and 0.32 for primary workers across all earnings deciles and secondary workers altogether. In a meta-analysis, Chetty et al. (2013) conclude: "The estimates in table 1 should therefore be interpreted as a rough guide to plausible targets for calibration: they suggest that extensive margin elasticities around 0.25 are reasonable, while values above 1 are not." We also show sensitivity results with each combination of the following elasticities: 0.5, 0.75, and 1.2 for EITC recipient tax units and 0.05, 0.25, and 0.45 for non-EITC recipient tax units.

[30] NAS (2019, p. 431) assumes an employment elasticity with respect to income of -0.05 for men and -0.12 for married women. Because we conduct our analysis at the tax unit level, we take the lower -0.05 estimate to model joint decisions to exit the labor force. NAS (2019, p. 545) reports an income elasticity of 0 for men in its simulation of child allowances—it is not clear whether the 0 elasticity reported on page 545 or -0.05 elasticity reported on page 431 was ultimately used.

Figure A9). For workers with earnings below $30,000, the return to work falls by less—with cell means between $450 and $2,400—because their CTC benefit had not yet fully phased in. Notably, the binned estimates of the decrease in the return to work that we empirically estimate using the CID align closely with the changes in the return to work across current earnings calculated for a hypothetical family in Appendix Figure A1.[31]

The extent to which the decrease in the return to work affects labor supply depends on the baseline return to work. If the baseline return to work is lower, a given decrease in the return to work will reduce labor supply more. Appendix Figure A10 shows the percent decrease in the return to work due to the change to a child allowance, relative to the baseline return to work under the CTC. Workers with earnings between $0 and $30,000 face a mean percent decrease in the return to work between 7% and 10%. The percent decrease in the return to work falls as earnings rise beyond $30,000, reflecting the higher baseline return to work (in dollars) for those with higher earnings.

We multiply the percent change in the return to work by the relevant labor supply elasticity for each worker (0.75 for single mother EITC recipients and 0.25 for all other workers with children), and we multiply the percent change in income by the relevant income elasticity (0.085 for single mother EITC recipients and 0.05 for all other workers with children). As a result of replacing the CTC with a child allowance, we estimate that employment falls by 1.46 million workers, representing 2.6% of all working parents. Workers with earnings below $50,000 account for 72% of the employment loss (Appendix Figure A11). Most the of the employment reduction (1.32 million) is the result of the substitution effect from a decreased return to work. The remaining portion (0.14 million) is the result of the income effect from increasing incomes of working families. Table A8 reports employment reductions under other labor supply elasticity assumptions.

We do not account for the reduction in work hours among current workers who continue working under the change to a child allowance. Since the implicit marginal tax rate rises for workers on the phase-in portion of the CTC, there will likely be a reduction in hours worked among those who continue to work. Whereas the CTC rewards an additional dollar of earnings with approximately $0.15 of benefits for these workers, the child allowance provides no reward for an

[31] We would not necessarily expect the levels of the return to work in Appendix Figures A1 and A9 to be equal because the hypothetical assumed two children. The changes, however, should be roughly similar if there are not large differences in the number of children across earnings bins.

additional dollar of earnings. We estimate that 10.4 million workers on the phase-in portion of the CTC face on average a 14.6 percentage point increase in their implicit marginal tax rate due to the change to a child allowance (Table A9).[32] Not accounting for reductions in earnings of these workers facing higher implicit marginal tax rates will lead us to understate poverty in our dynamic simulations. The implicit marginal tax rate also rises for workers on the phase-out portion of the child allowance. Because the child allowance phases out at a 5% rate, the implicit marginal tax rate of these workers rises by 5 percentage points. However, the hours reductions of these workers are unlikely to lead their families into poverty because the phase-out begins at $112,500 of AGI for head of household tax units and $150,000 for married tax units filing jointly.

**Incorporating Labor Supply Reductions into Poverty Simulations**

We next incorporate the earnings losses resulting from the labor force exit of 1.5 million estimated workers into our estimates of the overall and child poverty rates under the child allowance. To do so, we adjust post-tax, post-transfer incomes for the families of current workers who exit the labor force. We subtract earnings, reduce tax liabilities, and add transfer benefits resulting from the reduction of earnings, while also recalculating the child allowance amount based on the reduction in AGI due to lost earnings. Finally, we estimate the number of individuals and children whose (adjusted) equivalized post-tax, post-transfer family income falls below the poverty threshold ($37,890 for a two-parent, two-child family) and deep poverty threshold ($18,945). See Appendix E for a detailed methodology.

Table 3 reports the overall and child poverty rate after accounting for labor supply reductions. Under the CTC, the child poverty rate was anchored to 13.7%. The change to a child allowance reduces the child poverty rate to 10.8%, a 22% decrease, based on our dynamic simulation. By comparison, the change to a child allowance cuts child poverty by 34% based on our static simulation. Thus, accounting for changes in labor supply induced by the policy change cuts the static child poverty reduction by over a third. Table 3 also reports results for deep poverty. The change to a child allowance does not reduce deep poverty among children in our dynamic simulation, eliminating the entire 39% static estimate of the deep poverty reduction. Deep poverty among the overall population also does not fall under our dynamic simulation, compared to the 15% static estimate. These findings on deep poverty can be explained by the inability of child

[32] See Appendix F for our methodology for these estimates.

allowance and SNAP benefits by themselves to lift a family over half of our poverty line. For example, a single parent with two children would receive between $6,000 and $7,200 from the child allowance and about $7,000 in SNAP benefits, less in total than the $18,945 deep poverty threshold.[33] It is worth noting, however, that because of our improvements to income measurement our baseline deep poverty rates are much lower than official ones, despite the higher thresholds.

# 7. Discussion

This section puts our results in perspective. First, we discuss the plausibility of our estimate of 1.5 million workers exiting the labor force—to do so, we compare our estimates to the estimated effects of the EITC in NAS (2019), the effects of welfare reform in the 1990s, and other research bearing on the sensibility of our labor supply estimates. Second, we briefly discuss the NAS committee's omission of the main labor supply effect when modelling the replacement of the CTC with a child allowance, and their inclusion of income effect estimates which are similar to ours. Third, we discuss the targeting of the child allowance. Fourth, we discuss some caveats and unaccounted for factors that would likely lead our estimates to overstate the effects on poverty and understate the effects on work effort. Fifth, we mention some long-run effects that would enter an overall evaluation of the change to a child allowance.

**Plausibility of Labor Supply Estimates**

We start by discussing the plausibility of the estimated 1.5 million person decline in employment from replacing the CTC with a child allowance akin to a universal basic income for families with children. NAS (2019) does not account for the decrease in the return to work when modeling the replacement of the CTC with a child allowance whose parameters (a $3,000 annual per child payment for all low and middle income families) are similar to those proposed under the Build Back Better Act. However, NAS (2019) simulates an expansion of the EITC that changes work incentives in a similar manner and for a similar population as the child allowance. In their case, they are looking at an increase in work incentives while the change to a child allowance would do the reverse. We use the NAS EITC simulations as a comparison to our child allowance

[33] We do not model newly obtained housing assistance or TANF for families experiencing employment loss because they are not entitlement programs. Some newly poor families may eventually obtain benefits from these programs which could lift them out of deep poverty.

simulations in two ways. First, we use our methods to simulate EITC changes and compare to their EITC estimates, and second, we use their methods to simulate a child allowance and compare to our child allowance estimates.

NAS simulates a policy that would expand the EITC by increasing all federal payments by 40%. In this case, NAS (2019) accounts for the decision to work at all and estimates that the increase in the return to work from the EITC expansion would bring 771,000 new parents (single mothers) into employment (p. 495).[34] If increasing the EITC by 40% would bring 771,000 new parents into employment, then—by symmetry and linear extrapolation—eliminating the existing EITC would be expected to lead 1.9 million workers to exit employment.[35] Our first approach applies the same elasticities we used for our simulation of the change to a child allowance, to estimate the effect of eliminating the existing federal EITC. We find that such a change would reduce employment by 1.7 million workers. Since our EITC employment loss estimates are slightly smaller than those of NAS (2019), we may expect that NAS would obtain a slightly larger effect than our child allowance estimates if it incorporated the decrease in the return to work from eliminating the CTC.

Our second approach, shown in detail in Appendix B, uses the much simpler NAS methods based on a derivative of the employment probability with respect to the return to work (from Hoynes and Patel 2018)−rather than an elasticity−that they applied to the EITC simulations. We apply this derivative only to single mothers as NAS also did. Even without accounting for any changes in employment by single fathers or married couples due to their decreased return to work, that calculation implies a reduction in employment of 1.3 million parents, nearly as large as our estimate. Adding on a small decrease in employment of other parents to this second calculation would almost certainly lead to a decline greater than our base estimate of 1.46 million. Thus, our methods applied to the EITC provides estimates that are similar to the NAS EITC estimates, and the NAS EITC methods applied to the child allowance gives estimates close to our child allowance estimates. In both cases, the estimates using NAS methods are higher than ours.

[34] It appears that NAS (2019) estimates that approximately 200,000 current workers would stop working due to the EITC expansion they model (p. 490, p. 495). Note that we are not including this partially offsetting decline in employment as it is due to the increase in marginal tax rates that would be part of the EITC expansion and there is not an analogous change with the elimination of the CTC. To make the estimates comparable, we do not account for this effect in our calculations.

[35] If there are decreasing returns to incentives to participate in the labor force, then the decrease in employment would be even greater.

The relative similarity of our estimates of the employment effects of replacing the CTC with a child allowance and eliminating the EITC illuminates the common feature of the EITC and CTC in encouraging work. As shown in Figure 2, the EITC more strongly encourages work than the CTC for parents with earnings up to $30,000, while the CTC more strongly encourages work than the EITC for parents with earnings above $30,000. The somewhat smaller employment reduction from the change to a child allowance—despite the inclusion of an income effect that does not apply when eliminating the EITC—is a result of greater responsiveness to the changed work incentives at low earnings levels. However, work incentives of the CTC are still substantial even for those with low earnings and have important effects for those with earnings above $30,000 as well.

The employment decrease we estimate is also consistent with the rise in employment among single mothers during the welfare reforms of the 1990s. Between 1990 and 1999, the employment of single mothers rose by 1.2 to 1.4 million people (Han, Meyer, and Sullivan 2021).[36] Welfare reform had many features, but the two most salient were the expansion of the EITC which increased the financial return to working, and the elimination of unconditional cash aid under the TANF program. The replacement of the CTC with a child allowance incorporates these two main features of welfare reform, but in the opposite direction, reducing the financial return to work and providing unconditional cash aid to an even larger group than the original Aid to Families with Dependent Children (AFDC) program.

To interpret the applicability of the experience of welfare reform to the change to a child allowance, it is helpful to scale the relative size of the changes in work incentives and unconditional aid. In 1990, AFDC provided aid to 3.8 million adults and their children (U.S. Department of Health and Human Services 2004a), but the number had declined to 1.9 million by 1999 (U.S. Department of Health and Human Services 2004b). Thus, the number of adults receiving aid declined by about 1.9 million. The child allowance would reach several multiples of that count, including about 9.6 million single parents, excluding cohabiting couples (United States Census Bureau 2020).[37] Under AFDC, a non-working single parent with two children in 1994 could receive a maximum annual benefit of $8,175 (in 2021 dollars) in the average state (U.S.

[36] The range of estimates is due to a choice of whether to control for the education of single mothers (which greatly increased over this period) or not, and if so, what year to use for the base year distribution.
[37] However, it should be noted that the child allowance would not bring back the high implicit marginal tax rates that applied to the 1.9 million parents receiving AFDC prior to welfare reform but not after.

Department of Health and Human Services, n.d.). In comparison, the child allowance would provide between $6,000 and $7,200 of unconditional cash assistance to a non-working single parent with two children. The relative size of the EITC and child allowance work incentives were described in Section 2, where we showed that the incentives of the CTC reversed by the child allowance are a substantial share of the EITC incentives at very low earnings, and exceed EITC incentives at earnings above $30,000. But that figure for the EITC in 2021 reflects increases in the EITC prior to 1990 to which we cannot attribute the increase in employment of single mothers in the 1990s. In 1990 the maximum credit was already $1,934 (in 2021 dollars) compared to the $5,920 in Figure 1b. Thus, the change in the EITC incentives (along with TANF changes) that led to the 1.2 to 1.4 million increase in employment are substantially smaller than the EITC incentives indicated in Figure 1b and more comparable to the child allowance work incentives that go in the opposite direction.

A large body of evidence concludes that some combination of EITC expansion and welfare reform was responsible for the large rise in employment among single mothers during the 1990s, beyond the effect of a strong economy (Meyer and Rosenbaum 2001; Grogger 2003). While the bulk of the literature concludes that the EITC expansion played a large role (see Schanzenbach and Strain 2020), some have argued that the shift away from unconditional cash assistance under AFDC was more important (Kleven 2019). Whether thought of as reversing welfare reform or eliminating a program similar to the EITC, the change to a child allowance could be expected to reverse most or all of the employment gains of the 1990s.

Going beyond the plausibility of our employment change estimates, the similarity of replacing the CTC with a child allowance to reversing the welfare reforms of the 1990s has implications for the effects of the child allowance on poverty. If bringing back unconditional cash aid and eliminating substantial work incentives can be thought of as reversing welfare reform, it might undo the effects of welfare reform on poverty. When one accounts for the underreporting of transfers by either using consumption measures of well-being or relying on broader measures of income, researchers have found that poverty fell and well-being at the bottom rose following welfare reform (Meyer and Sullivan 2008; Winship 2016; Han, Meyer, and Sullivan 2021). Han, Meyer, and Sullivan (2021) find that low percentiles of the consumption distribution for single mothers rose more than middle or high percentiles. They further find that consumption rose for low-educated single mothers over time, in both absolute terms and relative to comparison groups

of highly educated single mothers, single women without children, and married mothers. Furthermore, recent work with the CID directly shows that survey income when joined with administrative data for single mothers over this period shows a reduction in poverty and deep poverty consistent with the consumption evidence (Corinth, Meyer and Wu Forthcoming). Additional evidence on the plausibility of our labor supply estimates comes from Lippold (2019). He estimates that when a child turns 17 and thus loses eligibility for the CTC—prior to the more generous TCJA version taking effect—low-income parents' probability of employment falls by 8.4 percentage points, implying a short-run work participation elasticity with respect to the return to work of 1.04.

More broadly, evidence of employment reductions has been found in the context of other means-tested programs. As seen in Appendix Figure A3, the difference between the child allowance and CTC for each family is similar in structure to means-tested programs such as SNAP that provide a maximum amount of benefits to those with no income and phase out as income rises. Hoynes and Schanzenbach (2012) estimate that SNAP receipt during the program's rollout in the 1960s and 1970s (then called the Food Stamp program) reduced employment of single women recipients by between 24 and 27 percentage points. While those effects apply to a period of less generosity of other programs, East (2018) estimates that SNAP receipt during the 1990s and 2000s reduced employment of single women immigrants (who on average had 1.3 children in her sample) by 43%. Reductions in labor supply of varying amounts and durations have been found for other means-tested programs, including for housing assistance for which effects are smaller and tend to fade out in the long run (Jacob and Ludwig 2012; Mills et al. 2006; Gubits et al. 2018) and experimental negative income tax programs in the 1970s (Robins 1985).

**NAS Modelling of the Change to a Child Allowance**

In explaining its modeling of a child allowance, the NAS report notes that a child allowance in its simplest form only has an income effect, i.e., it does not change the return to work. However, the report then applies this reasoning to simulations that involve eliminating either the pre-TCJA

CTC or the TCJA CTC.[38] Others have noted that the change to a child allowance has a substitution effect, altering the return to work, but have not considered the work/nonwork decision.[39]

Our estimate of the income effect of the child allowance is very similar to that of the NAS report, which is unsurprising given that we use the same elasticities. NAS (2019) estimates that a child allowance of $3,000 per child would reduce employment by 149,000 workers, similar to the 138,000 reduction we estimate. The difference likely arises from using a different baseline benefit (NAS uses the smaller pre-TCJA CTC), a different maximum benefit for children aged 0 to 5 (NAS uses $3,000 instead of $3,600), and an earlier phaseout of the child allowance in the NAS simulation.

**Caveats**

A few caveats are in order. First, while our baseline estimate is that employment will decline by 1.5 million adults based on the midpoint of ranges used in past simulations and the central tendency of literature surveys, both lower and higher changes are predicted by other elasticities in the literature. Second, we only include changes in participation, which are simpler to model than hours changes. Since we rely on elasticities from the literature rather than estimate a full structural model, we would need other information to allocate the average tendencies implied by hours elasticities to particular individuals. For example, we do not know whether a one percent decline in average hours implies a ten percent decline for one in ten people or a one percent decline for every worker.

Third, we would also need a more sophisticated model than the one we employ to consider the separate incentives of both spouses in a couple. These complications are avoided in our modeling of the work/nonwork decisions for single worker families since average tendencies imply probabilistic choices that are easily modeled. As a result, we focus only on the work/nonwork decision, not incorporating the reduction in hours that would be expected for those

[38] While NAS (2019) uses as its baseline the smaller pre-TCJA CTC which offered a maximum payment of $1,000 per child, decreasing the return to work by $1,000 per child is still a significant work disincentive (in alternative estimates, NAS uses the TCJA CTC as its baseline, estimates which similarly do not appear to account for the decrease in work due to the elimination of the existing CTC).

[39] See Winship (2021) and Goldin, Maag, and Michelmore (2021). These authors discuss the substitution effect along the phase-in of the CTC schedule, but not the participation margin which past work has found to be the important one for this population. Furthermore, the work/non-work decision is affected by more than the phase-in—it is affected by the entire CTC schedule, even parts that are flat where there is no substitution effect operating on hours worked. While these workers do not face an increased implicit marginal tax rate on an additional dollar of earnings with the change to a child allowance, their return to working at all falls.

who remain in the workforce due to the increase in marginal tax rates along the previous phase-in and over the new phase-out of the CTC. This understatement of the work response is likely offset to some extent by our simplified work decision of couples, taking them both to stop working or neither to stop working. In fact, the employment response for couples should be spread across a larger number of families, some of whom would have only one spouse leave the labor market. Since the loss of one out of two low-income earners from a family is likely to lead a family to be below the poverty line but not the deep poverty line, the implication of our simplification is that the child poverty reduction of the child allowance has likely been overstated, but the deep child poverty reduction understated. As the large majority of our response comes from single worker families, even assuming no response of dual-earner couples would leave intact the large majority of the behavioral response we estimate. At least 83 percent of the families that experience a drop in earnings in our simulations have only one worker and are unaffected by this issue.[40]

Fourth, we do not incorporate estimates of the crowding out of private transfers from increases in public transfers. Nikolov and Bonci (2020, footnote 8 in particular) review this literature, reporting that numerous studies in developed countries examine the crowding out of familial transfers by public transfers. They provide a long list of substantial effects that have been found in studies of the U.S. or Germany. Finally, even without changes in fertility or marriage, there is evidence of changes in living arrangements in response to changes in welfare policy (see, e.g., Bitler, Gelbach, and Hoynes 2006), that would suggest that a child allowance would shift children to less financially secure households. All of these effects would tend to diminish any reduction in poverty from a child allowance, and we (and other researchers) do not account for them.

**Long-Run Effects**

Potential long-run effects of the change to a child allowance are also important to consider alongside short-run effects. Increased support for low-income children could improve their long-run outcomes. Children's access to food stamps in the 1960s and 1970s led to improved outcomes when they became adults, including higher earnings (though not increased employment), better health, less incarceration and less dependence on welfare programs (Hoynes, Schanzenbach, and

[40] This figure is based on public-use data with various simplifying assumptions, as we have not yet disclosed the relevant numbers.

Almond 2016; Bitler and Figinski 2019; Bailey et al. 2020). Much of this evidence comes from a period when other safety net programs were much less generous than current aid, so the marginal effects might be lower today. Larger EITC payments for children have increased their educational attainment and their employment and earnings as adults (Bastian and Michelmore 2018). In that case, the policy being examined is a combination of more income and higher employment. The change to a child allowance could also affect behavior in less favorable ways, for example by changing rates of marriage or divorce. Some of the most methodologically sound research on this topic has found large effects of unconditional aid on single parenthood (Grogger and Bronars 2001). Consistent with this microdata evidence, the share of children with a single parent stabilized and then reversed after welfare reform, reversing a more than thirty-year trend.[41] Single parenthood has been found to lead, for example, to lower levels of educational attainment and higher incarceration rates of children in the long run (Hoffman and Maynard 2008).

# 8. Conclusions

In this paper, we simulate the effects of replacing the CTC with a child allowance that would increase maximum benefit amounts and be available to all low- and middle-income families with children regardless of earnings or tax liability. Absent behavioral responses, child poverty would fall by 34% and deep child poverty would fall by 39%. These static simulations suggest that the change to a child allowance would become the most important anti-poverty program for children in the United States (keeping 3.4 million children out of poverty). However, the poverty reduction would come at a cost of $101 billion in benefit dollars, implying that the child allowance would be less effective than other major means-tested programs in keeping children out of poverty per dollar of benefits. Relatedly, a smaller share of the child allowance would be targeted to families with lower levels of income and well-being.

These static calculations ignore any changes in behavior, in particular employment and hours decisions. The child allowance (akin to a universal basic income that provides benefits regardless of earnings) would replace the CTC, which like the EITC has substantial work incentives. Consequently, the policy change would reduce the return to work for most working parents by at least $2,000 per child. Among all working parents with earnings below $100,000,

[41] See https://www.census.gov/library/stories/2021/04/number-of-children-living-only-with-their-mothers-has-doubled-in-past-50-years.html.

the reduced incentive to work at all due to the change is 88% as large as the reduced incentive to work at all due to a hypothetical elimination of the EITC. We estimate that replacing the CTC with a child allowance would lead 1.5 million working parents to exit the labor force. The vast majority of the effect (1.3 million) is due to the decrease in the return to work. Our estimate is comparable in magnitude to that implied by a National Academy of Sciences simulation of the EITC and to the change in the employment of single mothers in the opposite direction during welfare reform. When incorporating the estimated employment reduction into our poverty simulations, we find that the change to a child allowance would reduce child poverty by at most 22% instead of the 34% reduction we found based on our static simulation. The change to a child allowance would not decrease deep child poverty, with labor supply changes reversing the 39% reduction we estimated based on a static simulation.

To undertake these analyses, we use the Comprehensive Income Dataset (CID), which links household survey data with administrative tax and program participation records. Relative to prior studies that rely on survey data alone, using the CID allows us to more accurately simulate tax liabilities and credits (using actual tax unit structure and inputs) and provides a more accurate distribution of baseline incomes (which are misreported in the survey data). By providing accurate reports of government program receipt, the CID also enables more accurate comparisons of the anti-poverty and targeting effects of the child allowance with those of existing programs. Finally, the CID retains the strengths of surveys, allowing us to observe the family structure of individuals, measure targeting via well-being characteristics like education and health, and incorporate income sources not fully captured by administrative sources.

The comparisons of results obtained using the CID and the survey data alone yield both similarities and differences. In terms of similarities, we find that using survey data alone and the CID both produce a static decline in child poverty of approximately 34% (from a baseline rate of 13.7%) as a result of the change to a child allowance. However, we also find differences between the CID and survey-only estimates along a number of dimensions. First, given the underreporting of survey incomes, the static decline in child poverty using the CID is estimated using poverty thresholds that are 14% higher than those using the survey alone and 40% higher than official thresholds. Furthermore, by more accurately measuring the receipt of existing government programs, the CID shows that the differences in preventing poverty (not accounting for labor supply responses) between the child allowance and the EITC and SNAP are 52% and 66% smaller,

respectively, relative to using the survey alone. Finally, using the CID relative to survey data alone demonstrates that the share of existing tax credits targeted to those in the bottom decile of the income distribution increases by 50% for the EITC and nearly 400% for the CTC.

While prior studies using the CID have addressed issues ranging from the measurement of poverty to the effects of existing programs on economic well-being, this is the first paper to use the CID to more accurately simulate the effects of proposed policies. In doing so, it provides a blueprint for future simulations of proposed policies that rely on the more accurate information from linked survey and administrative data.

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# Tables and Figures

## Table 1. Aggregate Recipients and Benefit Dollars for Child Tax Credit and Child Allowance

| Scenario | Families (millions) (1) | All people (millions) (2) | Children (millions) (3) | Spending (billions $) (4) |
|---|---|---|---|---|
| **2018: CTC** | | | | |
| CID | — | — | — | 110.2 |
| IRS SOI | — | — | — | 117.7 |
| **2022: CTC** | | | | |
| Survey-only | 35.1 | 142.5 | 63.3 | 106.8 |
| CID | 40.7 | 161.2 | 67.3 | 111.8 |
| **2022: Child Allowance** | | | | |
| Survey-only | 40.3 | 163.0 | 71.4 | 205.1 |
| CID | 43.6 | 171.6 | 71.7 | 213.1 |
| **2022: Difference between Child Allowance and CTC** | | | | |
| Survey-only | 5.2 | 20.5 | 8.1 | 98.3 |
| CID | 2.9 | 10.4 | 4.4 | 101.3 |

Source: 2017 CPS ASEC (adjusted to 2018 or 2022 levels using changes in prices and benefits) linked to administrative IRS records, TAXSIM, 2018 IRS SOI line item totals

Notes: This table shows total family recipients, individual recipients, and total dollars paid out for the CTC and child allowance, calculated for various scenarios in both the CID and survey. Column 1 shows the total number of families that receive either the CTC or child allowance. A family is defined as a recipient if any tax unit within the family receives the benefit. Columns 2 and 3 show the total number of people and children who receive either the CTC or child allowance. An individual is defined as a recipient if they are in a family that receives the benefit. Finally, Column 4 shows total benefit dollars paid out in each scenario. The SOI total refers to the total number of non-refundable and refundable CTC dollars listed in the IRS's 2018 Statistics of Income line item totals. The "2022: Child Allowance" scenario assumes 75% take-up among non-filers. Filers in the survey are defined as those who are designated as filers in the CPS. Filers in the CID are defined as individuals in tax units who meet one of the following three conditions: a) they are in a tax unit that links to a 1040, b) their survey tax unit has non-zero federal tax liability before credits after being run through TAXSIM, or c) their survey tax unit has more than $500 in federal tax credits after being run through TAXSIM. The survey-only sample consists of all individuals in the 2017 CPS ASEC. The CID sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024.

**Table 2. Poverty Rate in 2022 Under Child Tax Credit and Child Allowance for Full and Child Population, Survey-Only vs. CID**

| Population | CTC (1) | Child Allowance (2) | Change (p.p.) (3) | Change (percent) (4) |
|---|---|---|---|---|
| **Survey Only** | | | | |
| **Regular Poverty (Threshold for family of 4: $33,229)** | | | | |
| Full population | 11.8% | 10.0% | -1.8 | -15.6% |
| Children under 18 | 13.7% | 9.1% | -4.6 | -33.8% |
| **CID** | | | | |
| **Regular Poverty (Threshold for family of 4: $37,890)** | | | | |
| Full population | 10.8% | 9.0% | -1.8 | -16.7% |
| Children under 18 | 13.7% | 9.1% | -4.6 | -33.6% |
| **Deep Poverty (Threshold for family of 4: $18,945)** | | | | |
| Full population | 2.3% | 2.0% | -0.3 | -14.5% |
| Children under 18 | 2.3% | 1.4% | -0.9 | -38.8% |
| **Near Poverty (Threshold for family of 4: $56,835)** | | | | |
| Full population | 26.6% | 24.9% | -1.7 | -6.4% |
| Children under 18 | 35.9% | 32.0% | -3.9 | -11.0% |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: This table shows static poverty reduction estimates for the replacement of the CTC with a child allowance using only the CPS ASEC and in the CID. The income concept for all estimates is post-tax, post-transfer income including all non-medical in-kind transfers, equivalized to adjust for different sharing unit sizes. The sharing unit is the family, defined as the SPM unit. The poverty threshold is equal to the $13.7^{th}$ percentile of equivalized family income for all children, determined separately for the survey-only and CID simulations. The table shows thresholds for a family with two adults and two children. The parameters of the CTC correspond to those under the Tax Cuts and Jobs Act, and the parameters of the child allowance correspond to those under the Build Back Better Act (which incorporates the American Families Plan). Both the survey-only and CID-based simulations assume 75% take-up of the child allowance among non-filers. The survey-only sample consists of all individuals in the 2017 CPS ASEC. The CID sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Table 3. Regular, Deep, and Near Poverty Rate in 2022 Under Child Tax Credit and Child Allowance for Full and Child Population, Dynamic Simulation, CID**

| | | Dynamic Simulation | | | Static Simulation |
|---|---|---|---|---|---|
| Population | Rate Under CTC | Rate Under Child Allowance | Change (p.p.) | Change (percent) | Change (percent) |
| | (1) | (4) | (5) | (6) | (7) |
| **CID** | | | | | |
| **Regular Poverty (Threshold for family of 4: $37,890)** | | | | | |
| Full population | 10.8% | 9.7% | -1.1 | -10.1% | -16.7% |
| Children under 18 | 13.7% | 10.8% | -3.0 | -21.5% | -33.6% |
| **Deep Poverty (Threshold for family of 4: $18,945)** | | | | | |
| Full population | 2.3% | 2.4% | 0.1 | 2.6% | -14.5% |
| Children under 18 | 2.3% | 2.3% | 0.0 | 0.6% | -38.8% |
| **Near Poverty (Threshold for family of 4: $56,835)** | | | | | |
| Full population | 26.6% | 25.4% | -1.2 | -4.6% | -6.4% |
| Children under 18 | 35.9% | 33.0% | -2.9 | -8.0% | -11.0% |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Dynamic estimates are based on simulations of the child allowance for 2022 and include labor force exits due to income and substitution effects. The substitution effect elasticities are applied to the percent decrease in return to work. Percent decrease in the return to work is the decrease in the return to work divided by the baseline return to work among currently working parents. The baseline return to work is earnings net of tax liability and reduced transfer benefits from working. The decrease in the return to work due to the replacement of the CTC with a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). The income effect estimate applies elasticities of 0.085 for single mothers receiving EITC benefits and 0.05 for other workers to the percent increase in income. The percent increase in income is the increase in benefits from the CTC to the child allowance divided by family post-tax and post-transfer income. A working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Exit probabilities due to income and substitution effects are modeled additively. All workers in a tax unit are modeled as both remaining or both exiting the labor force. We adjust tax liabilities and Supplemental Nutrition Assistance Program benefits for workers exiting the labor force. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Figure 1a. Child Tax Credit and Child Allowance, Single Parent with Two Children (One Aged 0-5 and Another Aged 6-16)**

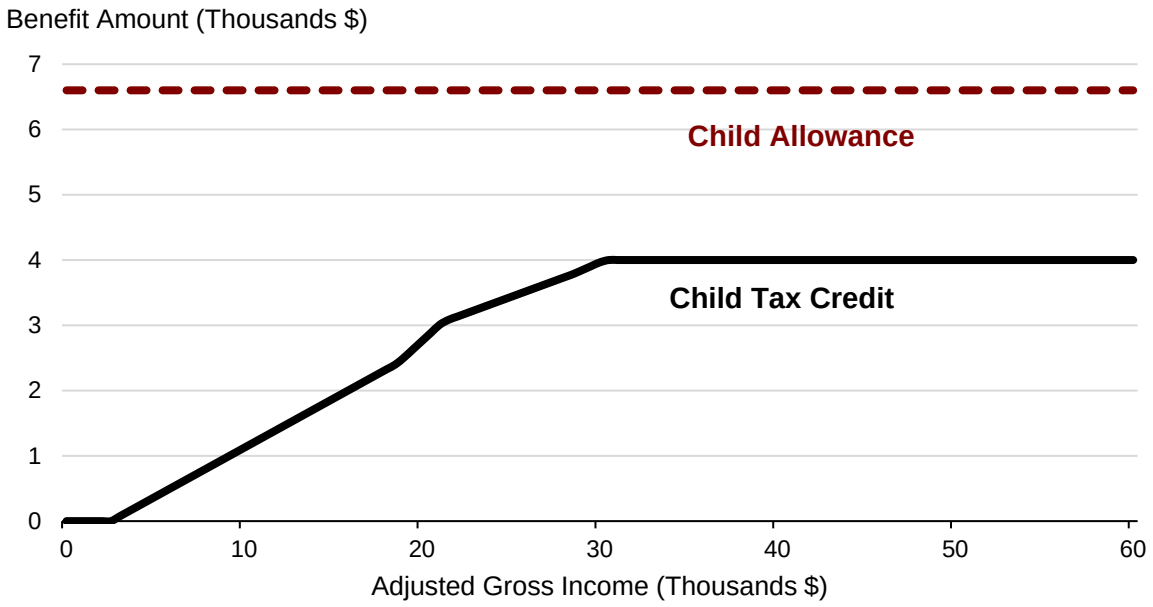
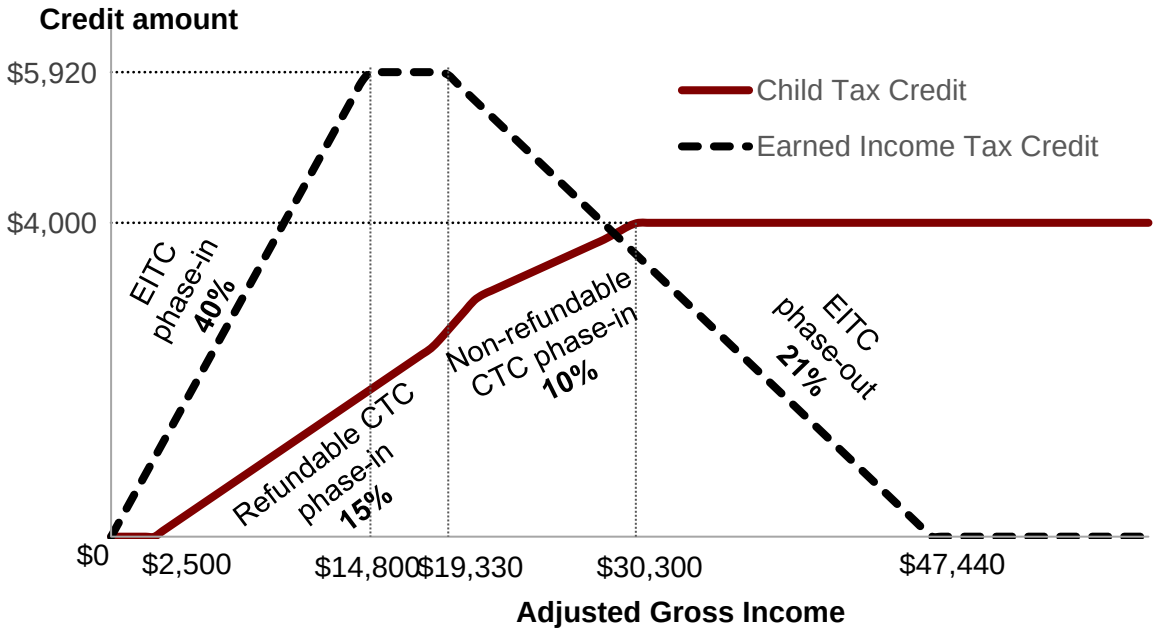
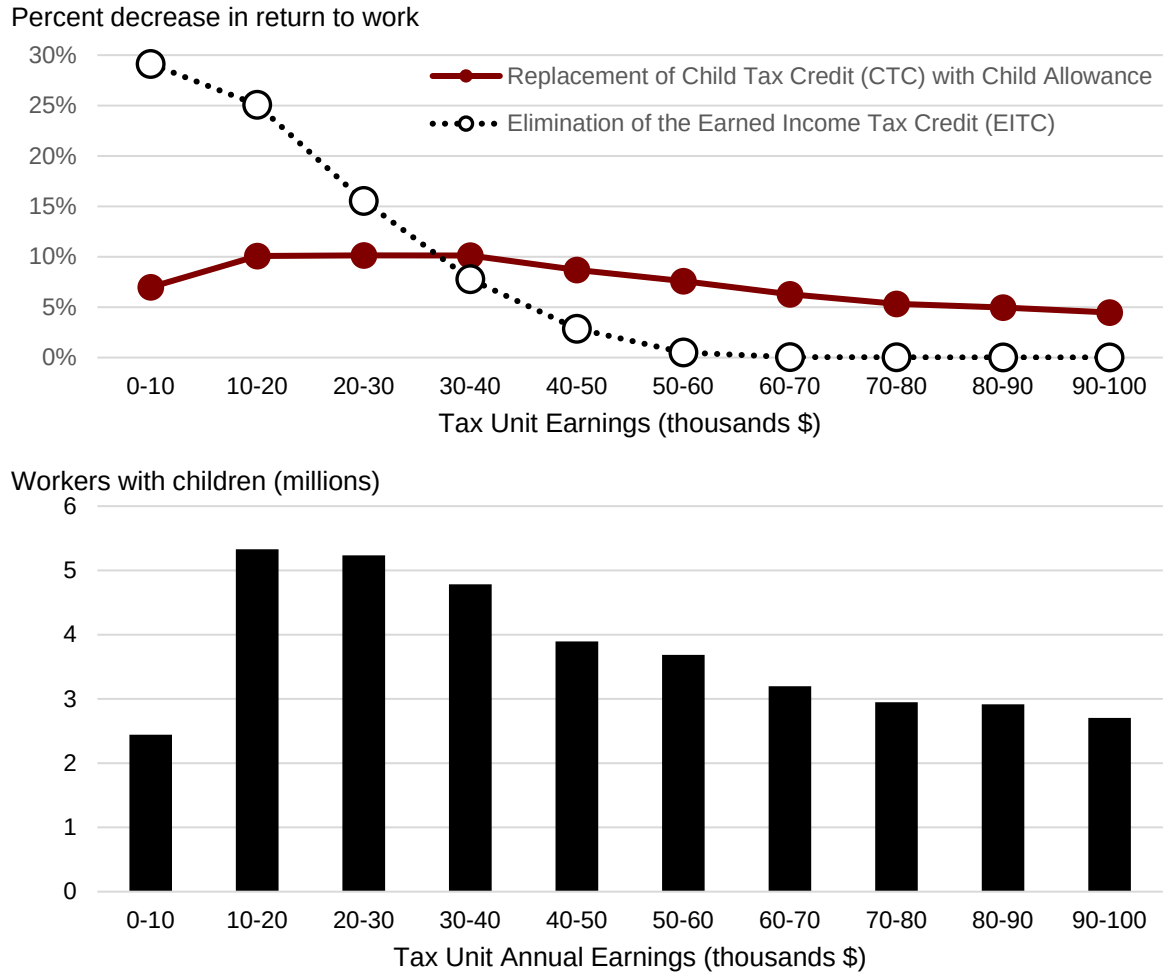



**Figure 1b. Child Tax Credit and Earned Income Tax Credit by Adjusted Gross Income Using 2020 Rules, Single Parent with Two Children Under Age 17**




Source: Internal Revenue Service, Congressional Research Service
Notes: Child Tax Credit (CTC) and Earned Income Tax Credit (EITC) parameters are based on 2020 tax law (all dollar values expressed in 2020 nominal terms). The child allowance is based on parameters set under the Build Back Better Act of 2021. All adjusted gross income is assumed to come from earned income, and the family is assumed to take the standard deduction and claim no other non-refundable tax credits.

**Figure 2. Mean Percent Decrease in the Return to Work Due to Replacement of Child Tax Credit with Child Allowance and Hypothetical Elimination of the Earned Income Tax Credit, and Number of Workers with Children, by Tax Unit Earnings**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Estimates in the top panel are based on simulations of the replacement fo the CTC with a child allowance for 2022 and the elimination of the EITC as it is defined by current law. Percent decrease in the return to work is the decrease in the return to work divided by the baseline return to work among currently working parents. The baseline return to work is earnings net of tax liability and reduced transfer benefits from working. The decrease in the return to work due to the change to a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). The change in the return to work due to the elimination of the EITC is the EITC benefit itself. A working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Tax unit earnings are reported in $10,000 bins. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Figure 3a. Percent Increase in Child Poverty in Absence of Given Program, Survey-Only vs. CID**

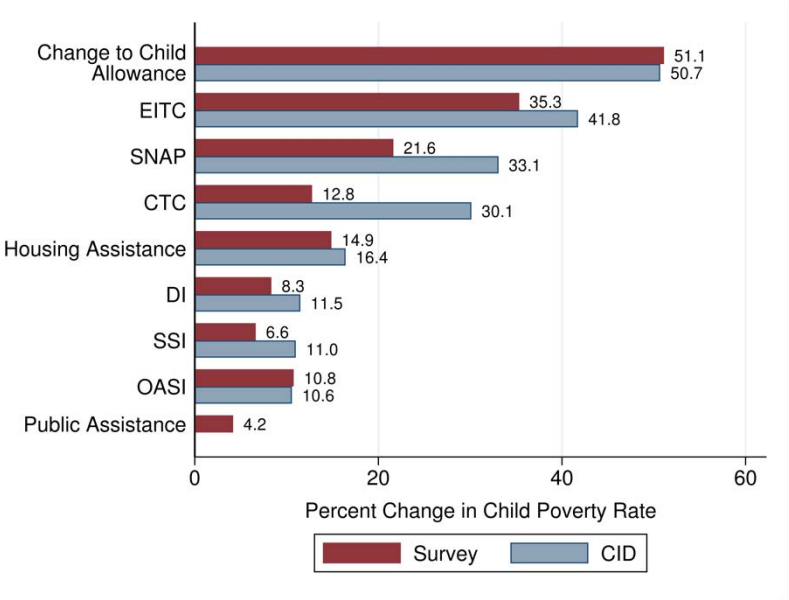
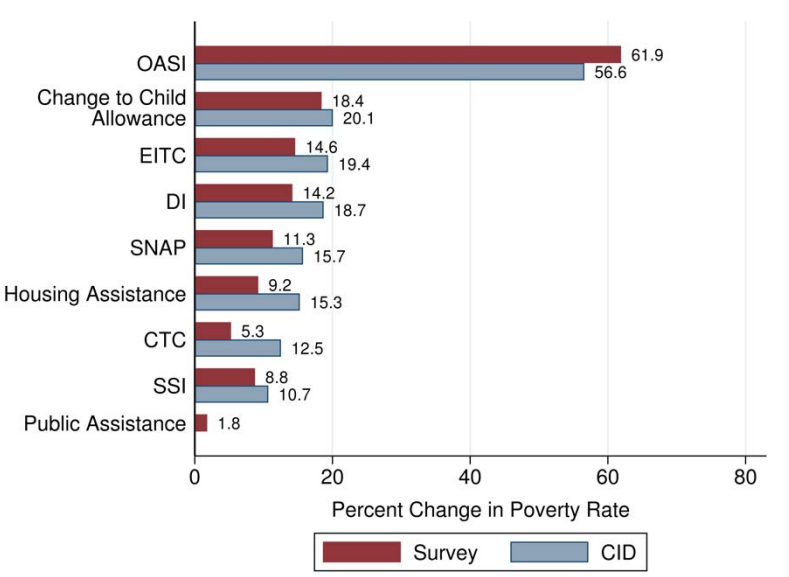


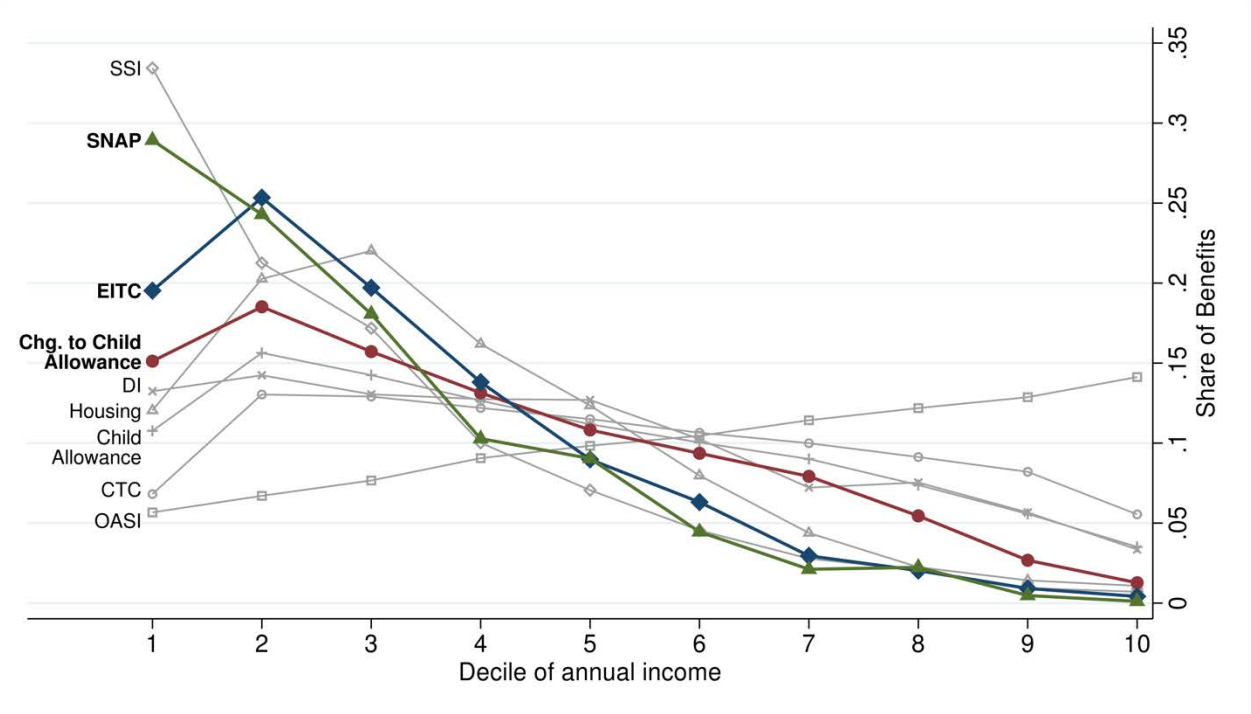

**Figure 3b. Percent Increase in Poverty in Absence of Given Program, Survey-Only vs. CID**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Baseline income is equivalized post-tax, post-transfer income including the child allowance. Both the survey-only and CID-based simulations assume 75% take-up of the child allowance among non-filers. The poverty threshold for a family of four (two adults and two children) is $37,890 in the CID and $33,229 in the survey only. Effects are calculated as the percent change in the poverty rate if the program were removed. For the CID-based simulation, we drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. For the survey-only simulation, our sample consists of all individuals in the 2017 CPS ASEC. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Figure 4. Share of Total Program Dollars Received by Decile of Annual Income, CID**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: This figure shows shares of total program dollars received by each decile of annual family income (after taxes/non-medical in-kind transfers and including the child allowance). Baseline incomes are equivalized to account for different family sizes. Administrative data are used for all programs. Baseline income and the child allowance use the CID-based CTC expansion simulation with assumed 75% take-up among non-filers. SNAP estimates are calculated using the subset of states for which administrative SNAP data are available. We drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

# Appendix Tables and Figures

## Table A1. Provisions of the Child Tax Credit and Child Allowance

| | Child Tax Credit | Child Allowance |
|---|---|---|
| Dependents who qualify for the full credit | Dependent children aged 0-16 | Dependent children aged 0-17 |
| Maximum amount of full credit | $2,000 per qualifying dependent | $3,600 (age 0-5), $3,000 (age 6-17) per qualifying dependent |
| Non-refundable portion of credit | Federal income tax liability (after previous non-refundable credits applied) up to $2,000 per qualifying dependent | None |
| Refundable portion of the credit | 15% of earned income above $2,500, up to $1,400 per qualifying dependent | $3,600 (age 0-5), $3,000 (age 6-17) per qualifying dependent |
| Adjusted Gross Income level where benefits begin to phase out | $200,000 (single/head of household filers); $400,000 (married filing jointly) | Phase out 1: $75,000 (single); $112,500 (head of household); $150,000 (married filing jointly)<br><br>Phase out 2: $200,000 (single/head of household filers); $400,000 (married filing jointly) |
| Phase out rate | 5% | Phase out 1: 5%, until per-child credit reaches $2,000 per qualifying dependent<br><br>Phase out 2: 5%, until credit reaches $0 |
| Provisions of the Credit for Other Dependents (ODC) | Applied to dependents who do not qualify for full credit, maximum credit of $500 per dependent, phased out at 5% rate beginning at $200,000 (single/head of household filers), $400,000 (married filing jointly) | Same as under TCJA CTC |

Source: IRS (2021a); IRS (2021b)

Notes: The provisions of the Child Tax Credit (CTC) correspond to those under the Tax Cuts and Jobs Act (TCJA) applicable to tax year 2020. The provisions of the child allowance correspond to those under the Build Back Better Act applicable to tax year 2021, as specified by the American Rescue Plan Act of 2021. Non-refundable portion of the Tax Cuts and Jobs Act CTC is applied after the Child and Dependent Care Tax Credit and the Credit for Other Dependents (see https://www.irs.gov/irm/part21/irm_21-006-003r). See Tax Policy Center (2021) for a description of the CTC and child allowance.

## Table A2. Rules Used to Update Various Income Sources to 2022 Levels

| Income source | How updated for 2022<br>(1) | Justification<br>(2) |
|---|---|---|
| Market income | Annual average in C-CPI-U | C-CPI-U used to update tax brackets each year |
| OASDI and SSI | Annual average CPI-W | CPI-W used to update OASDI and SSI benefits each year |
| VA benefits | Percent change in maximum benefit for veteran with no dependents, given 50% disability rating | Update based on maximum benefit |
| SNAP | Percent change in maximum benefit for 3-person family (separate multipliers for AK and HI), disregarding the 2020 emergency increase in maximum benefits due to pandemic benefits set to expire in September 2021 | Update based on maximum benefit |
| Housing assistance | Percent change in county-level Fair Market Rent for 2-bedroom housing unit | Benefit amount tied to payment standard in county which is itself based on Fair Market Rent |
| TANF | State-level change in maximum benefits for 3-person family | Update based on state-specific maximum benefit |
| School lunch | Percent change in reimbursement rate for free school lunch (separate multipliers for AK and HI) | Update based on reimbursement rate |
| LIHEAP | Percent change in Census region-level average utility gas prices in urban areas | Benefit amount tied to actual costs of utilities |
| WIC | Percent change in average monthly person-level WIC food costs | Update based on change in benefit |

Source: C-CPI-U (2016-2020), CPI-W (2016-2020), USDA SNAP maximum benefit amounts (2016-2020), Average WIC food costs (2016-2020), USDA School Lunch Reimbursement Rates (2016-2021), HHS TANF maximum benefit amounts (2016-2019), VA maximum benefit amounts (2016-2020), HUD fair market rents (2016-2021), BLS average utility gas prices (2016-2020)

Notes: Market incomes, OASDI/SSI, VA benefits, SNAP, WIC, and LIHEAP are updated based on the change in their respective indices between 2016 and 2020, with the 2020-2021 and 2021-2022 increases assumed to be equal to average annual increase from 2016 to 2020. For SNAP, we only update through 2020 because the 2021 amounts reflect temporary increases in SNAP allotment as a result of pandemic-related policy changes. School lunch and housing assistance are updated based on the change in their respective indices between 2016 and 2021, with the 2021-2022 increases assumed to be equal to the average annual increase from 2016 to 2021. For TANF, we update based on state-level changes in the relevant index between 2016 and 2019, with the 2019-2020, 2020-2021, and 2021-2022 increases assumed to be equal to the average annual increase from 2016 to 2019 at the national level (we use the change in the national average weighted by state population to mitigate carrying through potentially one-off state-level policy changes).

## Table A3. Simulations of the Child Allowance and Related Policies: Comparisons to the Literature

| Study | Survey data source (1) | Modifications of data source (2) | Simulated policy (3) | Simulation year (4) | Baseline child poverty rate (5) | % Effect on child poverty (6) | Non-filer take-up (7) | Use SPM (8) |
|---|---|---|---|---|---|---|---|---|
| Our paper: CID | 2017 CPS ASEC | Link tax records & admin government program data | Child allowance with $3,600 for children age 0-5 and $3,000 for children age 6-17 | 2022 (2018 tax law and update income values to 2022) | 13.7% | 33.6% | 75% | No |
| Our paper: survey-only | 2017 CPS ASEC | None | (Same as above) | 2022 (2018 tax law and update income values to 2022) | 13.7% | 33.8% | 75% | No |
| Acs and Werner (2021) | 2018 ACS | ATTIS model | (Same as above) | 2018 | 14.2% | 41.3% | 78% | Yes |
| Brill et al. (2021) | 2020 CPS ASEC | Not stated | (Same as above) | Not stated | 12.4% | 35% | Not stated | Yes |
| CRS (2021) | 2016-2018 CPS ASEC | TRIM model | (Same as above) | 2015-2017 (TCJA tax law) | 13% | 46% | 100% | Yes |
| Marr et al. (2021) | 2019 CPS ASEC | None | (Same as above) | 2021 (2021 tax law and inflate incomes to 2021) | 13.7%* | 41% | 100% | Yes |
| Collyer et al (2019) | 2018 CPS ASEC | None | Child allowance with $3,600 for children age 0-5 and $3,000 for children age 6-16 | 2018 | 14.9%** | 38%** | 100% | Yes |
| Collyer et al (2021) | 2019 CPS ASEC | None | American Families Plan | 2022 (updates employment) | 14.7% | 47.4% | 100% | Yes |

*Baseline child poverty rate is not reported in Marr et al. (2021). The rate is calculated based on the reported 41% reduction in child poverty and 4.1 million children lifted out of poverty, which implies a baseline of 10 million children in poverty, or 13.7% given the reported 72.993 million children in the U.S. according to Marr et al. (2021).

**Poverty rate among children aged 0 to 16 only.

Notes: ATTIS model is the Urban Institute's Analysis of Transfers, Taxes, and Income Security model. TRIM model is the Transfer Income Model developed by the Urban Institute for the U.S. Department of Housing and Urban Development. American Families Plan includes fully refundable CTC (i.e., child allowance) with $3,600 for children age 0-5 and $3,000 for children age 6-17, expansion of the EITC for childless workers; expansion of child care subsidies, expansion of the Child and Dependent Care Tax Credit, expansion of the Summer Electronic Benefit Transfer Program; and expansion of Pell Grant awards. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Table A4. Aggregate Recipients and Dollars for Child Allowance and Change in Child Poverty Rate (Varying Take-Up Rates Among Non-Filers), CID**

| Non-Filer Take-Up Rate | Number of Children Receiving AFP CTC (millions) | Total Spending on AFP CTC (billions $) | Percent Change in Child Poverty |
|---|---|---|---|
| | (1) | (2) | (3) |
| 0% | 69.1 | 201.0 | -29.9% |
| 25% | 70.3 | 205.2 | -31.0% |
| 50% | 71.1 | 209.2 | -32.4% |
| 75% | 71.7 | 213.1 | -33.6% |
| 100% | 72.3 | 217.1 | -35.5% |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: This table shows the total number of children receiving the child allowance, total child allowance spending, and percent change in child poverty under different assumptions of the take-up rate for non-filers. A child is defined as receiving the child allowance if they reside in a family where at least one tax unit within the family receives the child allowance. Filers are defined as individuals in tax units who meet one of the following three conditions: a) they are in a tax unit that links to a 1040, b) their survey tax unit has non-zero federal tax liability before credits after being run through TAXSIM or c) their survey tax unit has more than $500 in federal tax credits after being run through TAXSIM. The poverty threshold for a family of four is $37,890. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024 and CBDRB-FY2021-CES005-028.

## Table A5. Survey-Only Child Poverty Effects of the Child Allowance Based on Assumptions in Comparison Studies

| Comparison study | Subtract expenses (1) | SPM thresholds (2) | 100% take-up? (3) | Income adjusted to future year? (4) | Percent change in child poverty | |
|---|---|---|---|---|---|---|
| | | | | | Our analysis (5) | Comparison study (6) |
| Survey-only | No | No | No | Yes | -34% | |
| Survey-only w/ SPM | Yes | Yes | No | Yes | -34% | |
| Acs and Werner (2018) | Yes | Yes | No | No | -39% | -41% |
| CRS (2021) | Yes | Yes | Yes | No | -44% | -46% |
| Marr et al. (2021) | Yes | Yes | Yes | Yes | -38% | -41% |

Source: 2017 CPS ASEC (adjusted to 2022 levels using change in prices and benefits), TAXSIM

Notes: Survey-only refers to our survey-only simulation. Survey-only with SPM refers to our survey-only simulation when subtracting expenses from income and using the SPM thresholds. Expenses subtracted in column (1) include work and childcare expenditures, child support paid, and medical out-of-pocket and Medicare Part B expenditures. SPM thresholds in column (2) are obtained by scaling SPM thresholds included in the CPS ASEC by a constant multiple such that the child poverty rate matches the baseline rate in the published study as reported in Appendix Table A3. We use 2016 income values in comparisons with studies that do not adjust incomes for price and benefit changes and our 2022 income values in comparisons with studies that do adjust for a later year. Thus, income years do not match exactly in these comparisons. We do not compare our results to Brill et al. (2021) because they do not state their take-up rate and whether or not income is adjusted for a future year. For the survey-only simulation, our sample consists of all individuals in the 2017 CPS ASEC.

**Table A6. Percent Increase in Poverty in Absence of Given Program, Survey-Only vs. CID**

| Program | Spending (billions $) | | Percent increase in Poverty | |
|---|---|---|---|---|
| | All Families | Families with Children | Full Population | Children |
| | (1) | (2) | (3) | (4) |
| **CID** | | | | |
| Change to Child Allowance | 101.3 | 101.3 | 20.1% | 50.7% |
| Child Allowance | 213.1 | 209.5 | 35.7% | 89.2% |
| CTC | 111.8 | 108.2 | 12.5% | 30.1% |
| EITC | 73.1 | 58 | 19.4% | 41.8% |
| SSI | 53.9 | 18.8 | 10.7% | 11.0% |
| OASDI | 958.8 | 82.5 | 75.0% | 22.1% |
| *OASI* | 814.1 | 51.1 | 56.6% | 10.6% |
| *DI* | 144.8 | 31.3 | 18.7% | 11.5% |
| SNAP | 54.6 | 34.6 | 15.7% | 33.1% |
| Housing Assistance | 72.6 | 27.5 | 15.3% | 16.4% |
| **Survey Only** | | | | |
| Change to Child Allowance | 98.4 | 97.9 | 18.4% | 51.1% |
| Child Allowance | 205.1 | 203.3 | 29.4% | 80.6% |
| CTC | 106.8 | 105.4 | 5.3% | 12.8% |
| EITC | 48.5 | 44.6 | 14.6% | 35.3% |
| Public Assistance | 7.7 | 5.9 | 1.8% | 4.2% |
| SSI | 55.6 | 13 | 8.8% | 6.6% |
| OASDI | 859.8 | 64 | 76.4% | 19.4% |
| *OASI* | 744.1 | 42.3 | 61.9% | 10.8% |
| *DI* | 115.7 | 21.7 | 14.2% | 8.3% |
| SNAP | 34.7 | 21.5 | 11.3% | 21.6% |
| Housing Assistance | 30.6 | 15 | 9.2% | 14.9% |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Effects are calculated as the percent change in the poverty rate (using equivalized post-tax, post-transfer income) if the program were removed. The poverty threshold is $37,890 in the CID and $33,229 in the survey only. For the CID-based simulation, we drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. For the survey-only simulation, our sample consists of all individuals in the 2017 CPS ASEC. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024 and CBDRB-FY2021-CES005-028.

## Table A7. Cost per Individual Lifted out of Poverty by Program, CID

| | Spending (billions $) | | Cost per Individual Lifted out of Poverty | |
|---|---|---|---|---|
| **Program** | **All families** | **Families with children** | **Full Population** | **Children** |
| Change to Child Allowance | 101.3 | 101.3 | $17,602 | $29,680 |
| Child Allowance | 213.1 | 209.5 | $20,836 | $34,896 |
| CTC | 111.8 | 108.2 | $31,126 | $53,345 |
| EITC | 73.1 | 58 | $13,168 | $20,636 |
| SSI | 53.9 | 18.8 | $17,575 | $25,504 |
| OASDI | 958.8 | 82.5 | $44,579 | $55,579 |
| *OASI* | 814.1 | 51.1 | $50,145 | $71,746 |
| *DI* | 144.8 | 31.3 | $26,962 | $40,431 |
| SNAP | 54.6 | 34.6 | $12,312 | $15,655 |
| Housing Assistance | 72.6 | 27.5 | $16,583 | $24,863 |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Effects are calculated as the percent change in the poverty rate (using equivalized post-tax, post-transfer income) if the program were removed. The poverty threshold is $37,890 in the CID and $33,229 in the survey only. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. To estimate the cost per individual lifted out of poverty, we divide program spending by the number of individuals added to poverty if the program were removed. For the cost per child lifted out of poverty, we use program spending on families with children. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024 and CBDRB-FY2021-CES005-028.

**Table A8. Millions of Workers with Children Exiting the Labor Force due to Income and Substitution Effects from the Change to a Child Allowance, by Substitution Elasticity**

| Single Mother EITC Recipients | Other workers | | |
|---|---|---|---|
| | **0.05** | **0.25** | **0.45** |
| **0.50** | 0.70 | 1.25 | 1.79 |
| **0.75** | 0.92 | 1.46 | 2.00 |
| **1.20** | 1.30 | 1.85 | 2.39 |

Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Exit due to the income effect equals 0.14 million and is not impacted by substitution elasticities. Estimates are based on simulations of the child allowance for 2022 and include labor force exits due to income and substitution effects. The substitution effect elasticities are applied to the percent decrease in return to work. Percent decrease in the return to work is the decrease in the return to work divided by the baseline return to work among currently working parents. The baseline return to work is earnings net of tax liability and reduced transfer benefits from working. The decrease in the return to work due to the change to a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). The income effect estimate applies elasticities of 0.085 for single mothers receiving EITC benefits and 0.05 for other workers to the percent increase in income. The percent increase in income is the increase in benefit from the CTC to the child allowance divided by family post-tax and post-transfer income. A working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Exit probabilities due to income and substitution effects are modeled additively. All workers in a tax unit are modeled as both remaining or both exiting the labor force. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

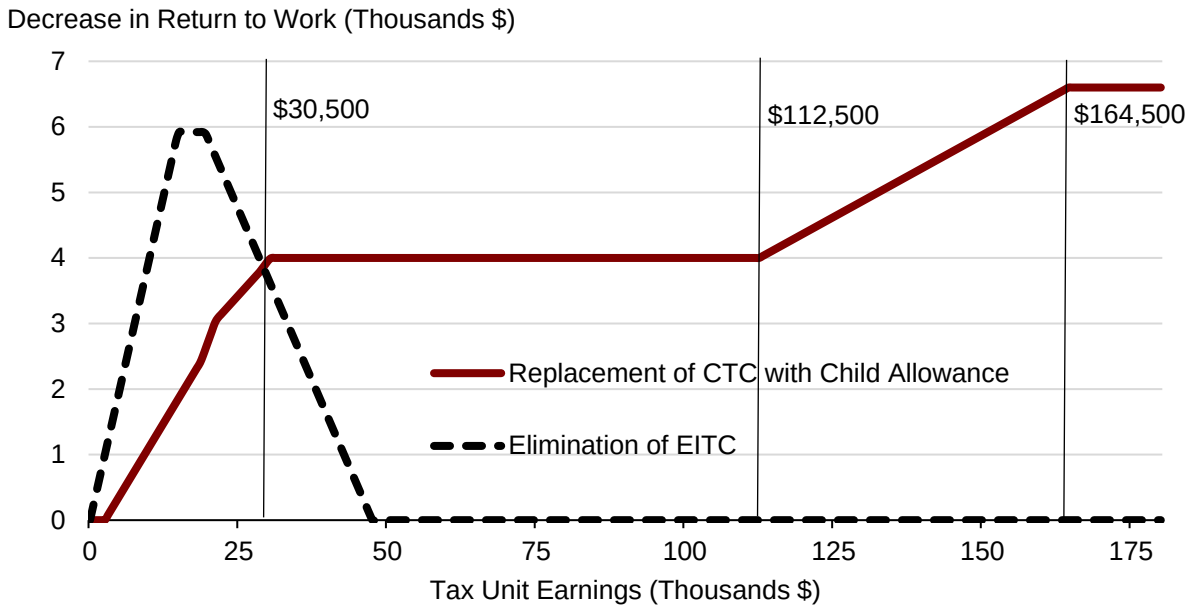
**Table A9. Number of Tax Units, Adults, and Workers Facing Higher Implicit Marginal Tax Rates with the Chjld Allowance—on Phase-In of the CTC—and Mean Change in Implicit Marginal Tax Rate, 2022**

| | | Workers on phase-in of CTC | |
|---|---|---|---|
| | Total (millions) (1) | Number with higher implicit marginal tax rate (millions) (2) | Mean p.p. change in implicit marginal tax rate (3) |
| Adults in tax units | 246.2 | 14.2 | 14.6 |
| Tax units | 180.4 | 11.9 | 14.8 |
| Workers in tax units | 163.7 | 10.4 | 14.6 |

Source: 2017 CPS ASEC (adjusted to 2022 levels using change in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Mean percentage point change in implicit marginal tax rate (column 3) is among those with a higher implicit marginal tax rate (column 2). The increase in the implicit marginal tax rate on an additional dollar of earnings in column (3) is equal to the phase-in rate of the CTC. This includes the phase-in of the ACTC, which phases in at $0.15 per dollar of earnings, and the phase-in of the non-refundable CTC, which phases in at the marginal federal income tax rate of the tax unit (generally 10% or 12% for tax units on the phase-in part of the TCJA CTC schedule). To infer the phase-in rate of the CTC, we exploit the fact that a tax unit receiving a strictly positive but less than maximum amount of a particular credit will receive more of that credit if its earnings increase by an additional dollar (with the exception of those tax units on the phase-out portion of the CTC). The increase in the implicit marginal tax rate on an additional dollar of earnings in column (5) is equal to the phase-out rate of the child allowance, $0.05 per dollar of earnings. Tax units receiving, under the child allowance, strictly more than the previous maximum benefit but strictly less than the new maximum benefit are considered impacted. See Appendix F for further details. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024.

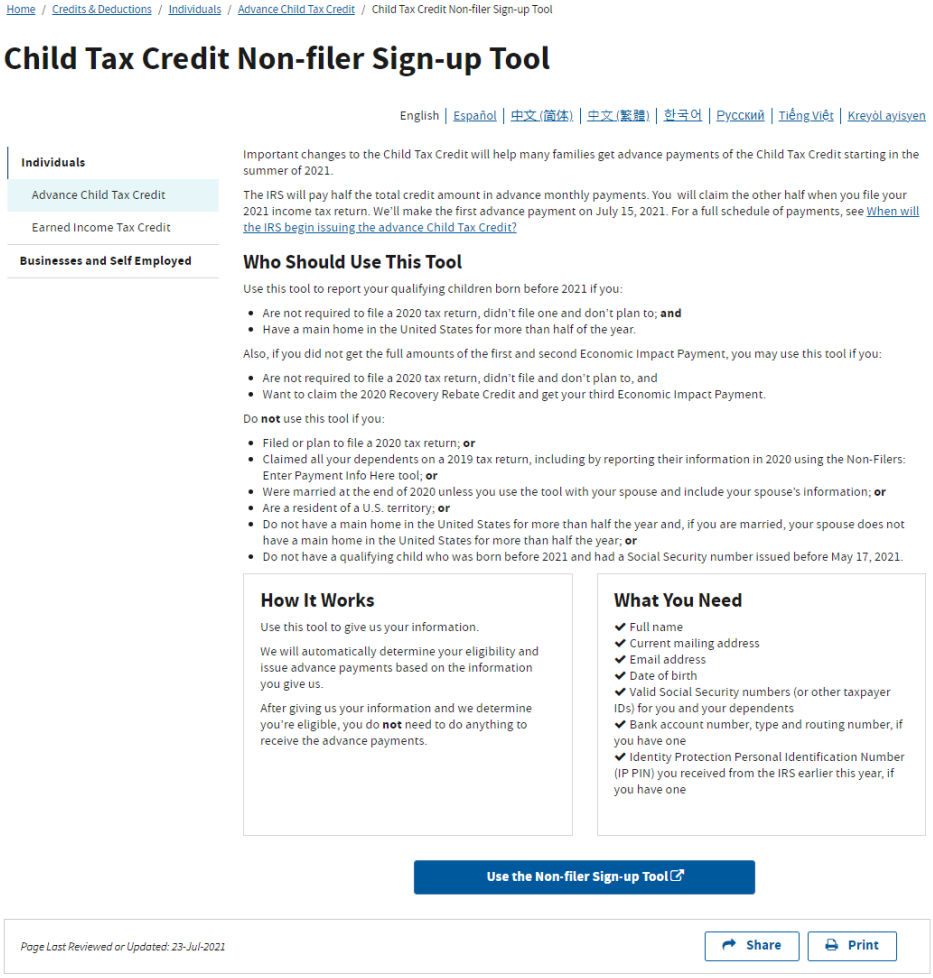
**Figure A1. Decrease in the Return to Work due to the Replacement of the Child Tax Credit with a Child Allowance Compared to the Elimination of the Earned Income Tax Credit, Single Parent with Two Children Ages 5 and 10**




Source: Internal Revenue Service, Congressional Research Service

Notes: Figure shows the decrease in the return from work due to the replacement of the CTC with a child allowance for a hypothetical single parent with two children and no unearned income. The decrease in the return to work is equal to the difference between the child allowance benefit and CTC amount when not working minus the difference between the child allowance benefit and CTC amount when working. For example, if the parent does not work, she receives $6,600 under the child allowance, which is $6,600 more than her CTC of $0. If she works and earns less than $30,300, her return to work falls by less than $4,000 due to the phase-in of the CTC. If she works and earns between $30,300 and $112,500, her return falls by $4,000, the amount of her CTC. If she works and earns between $112,500 and $164,500, her return to work falls by more than $4,000 because the child allowance begins to phase out. If she works and earns more than $164,500, her return to work falls by $6,600 because the additional amount from the child allowance has fully phased out. The decrease in the return to work due to the elimination of the EITC is equal to the EITC benefit itself.

## Figure A2. Sign-Up Website for Child Allowance under American Rescue Plan Act



Home / Credits & Deductions / Individuals / Advance Child Tax Credit / Child Tax Credit Non-filer Sign-up Tool

# Child Tax Credit Non-filer Sign-up Tool

English | Español | 中文 (简体) | 中文 (繁體) | 한국어 | Русский | Tiếng Việt | Kreyòl ayisyen

**Individuals**

Advance Child Tax Credit

Earned Income Tax Credit

**Businesses and Self Employed**

Important changes to the Child Tax Credit will help many families get advance payments of the Child Tax Credit starting in the summer of 2021.

The IRS will pay half the total credit amount in advance monthly payments. You will claim the other half when you file your 2021 income tax return. We'll make the first advance payment on July 15, 2021. For a full schedule of payments, see When will the IRS begin issuing the advance Child Tax Credit?

## Who Should Use This Tool

Use this tool to report your qualifying children born before 2021 if you:

- Are not required to file a 2020 tax return, didn't file one and don't plan to; **and**
- Have a main home in the United States for more than half of the year.

Also, if you did not get the full amounts of the first and second Economic Impact Payment, you may use this tool if you:

- Are not required to file a 2020 tax return, didn't file and don't plan to, and
- Want to claim the 2020 Recovery Rebate Credit and get your third Economic Impact Payment.

Do **not** use this tool if you:

- Filed or plan to file a 2020 tax return; **or**
- Claimed all your dependents on a 2019 tax return, including by reporting their information in 2020 using the Non-Filers: Enter Payment Info Here tool; **or**
- Were married at the end of 2020 unless you use the tool with your spouse and include your spouse's information; **or**
- Are a resident of a U.S. territory; **or**
- Do not have a main home in the United States for more than half the year and, if you are married, your spouse does not have a main home in the United States for more than half the year; **or**
- Do not have a qualifying child who was born before 2021 and had a Social Security number issued before May 17, 2021.

### How It Works

Use this tool to give us your information.

We will automatically determine your eligibility and issue advance payments based on the information you give us.

After giving us your information and we determine you're eligible, you do **not** need to do anything to receive the advance payments.

### What You Need

- ✔ Full name
- ✔ Current mailing address
- ✔ Email address
- ✔ Date of birth
- ✔ Valid Social Security numbers (or other taxpayer IDs) for you and your dependents
- ✔ Bank account number, type and routing number, if you have one
- ✔ Identity Protection Personal Identification Number (IP PIN) you received from the IRS earlier this year, if you have one

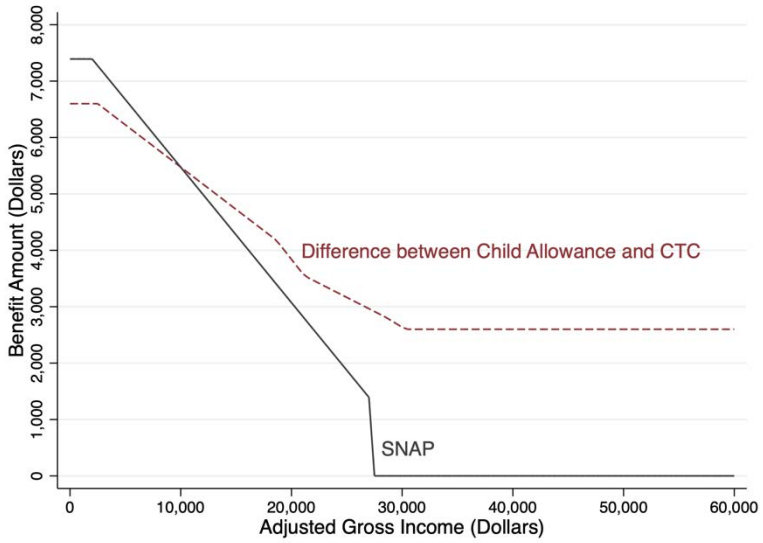
**Use the Non-filer Sign-up Tool**

*Page Last Reviewed or Updated: 23-Jul-2021*

Share Print

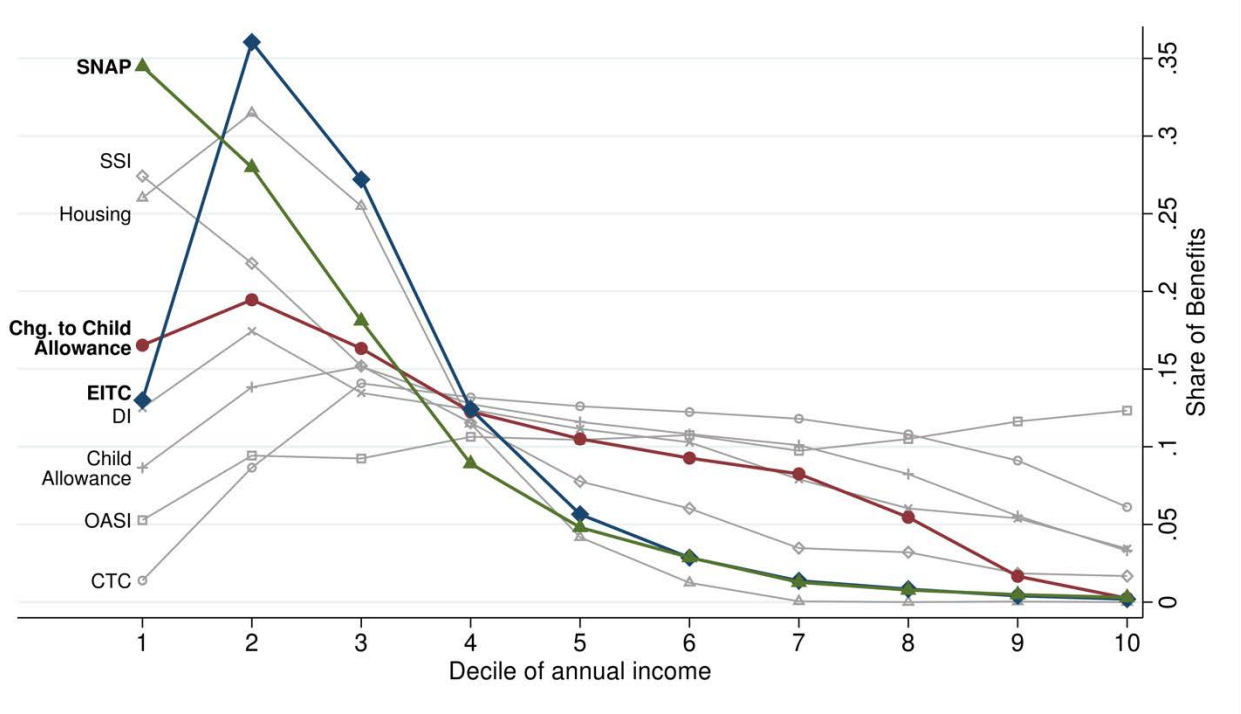
Source: Internal Revenue Service, accessed at <irs.gov/credits-deductions/child-tax-credit-non-filer-sign-up-tool> on September 5, 2021

**Figure A3. Additional Benefits from Child Allowance and Total Supplemental Nutrition Assistance Program Benefit, Single Parent with Two Children (One Aged 0-5 and Another Aged 6-16)**



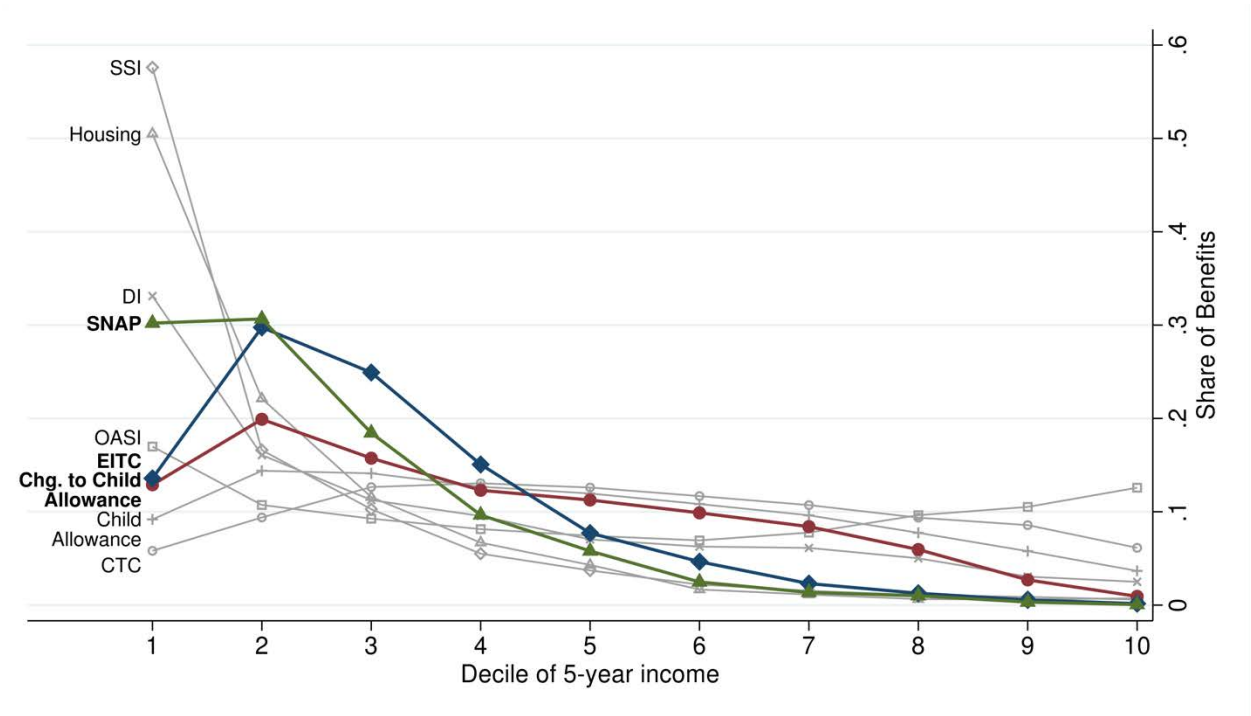

Source: Internal Revenue Service, U.S. Department of Agriculture
Notes: The CTC benefits correspond to those under the Tax Cuts and Jobs Act, and the child allowance benefits correspond to those under the Build Back Better Act of 2021. All adjusted gross income is assumed to come from earned income, and the family is assumed to take the standard deduction and claim no other non-refundable tax credits. For Supplemental Nutrition Assistance Program (SNAP) benefits, the family is assumed to take the standard deduction only. Benefit levels are based on 2021 rules.

**Figure A4. Share of Total Program Dollars Received by Decile of Annual Income, Survey-Only**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits), TAXSIM.
Notes: This figure shows shares of total program dollars received by each decile of annual family income (after taxes/non-medical in-kind transfers and including the child allowance). Baseline incomes are equivalized to account for different family sizes. Baseline income and the child allowance use the survey-based child allowance simulation with assumed 75% take-up among non-filers. Our sample consists of all individuals in the 2017 CPS ASEC.

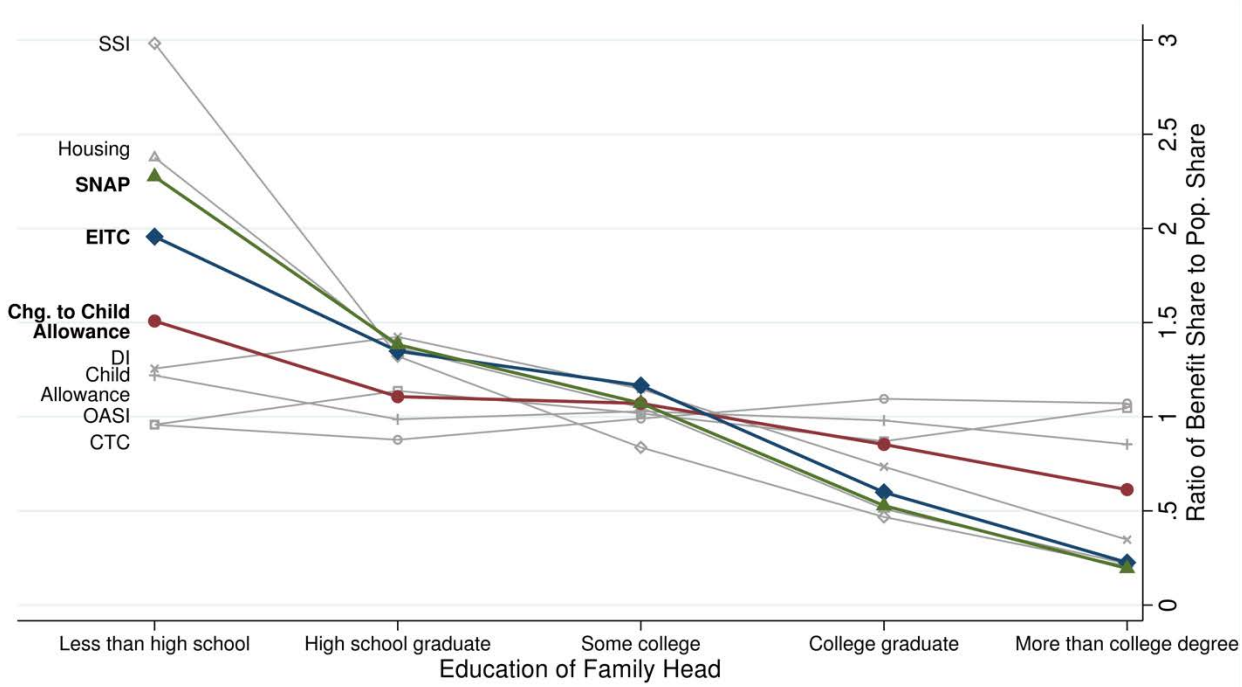
**Figure A5. Share of Total Program Dollars Received by Decile of 5-Year Income, CID**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: This figure shows shares of total program dollars received by each decile of 5-year income. 5-year income is the sum of income on tax forms (AGI on 1040 for filers and wages/retirement-income from W-2 and 1099-R for non-filers) from 2014-2018. Baseline incomes are equivalized to account for different family sizes. Administrative data are used for all programs. Baseline income and the child allowance use the CID-based child allowance simulation with assumed 75% take-up among non-filers. SNAP estimates are calculated using the subset of states for which administrative SNAP data are available. We drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024.

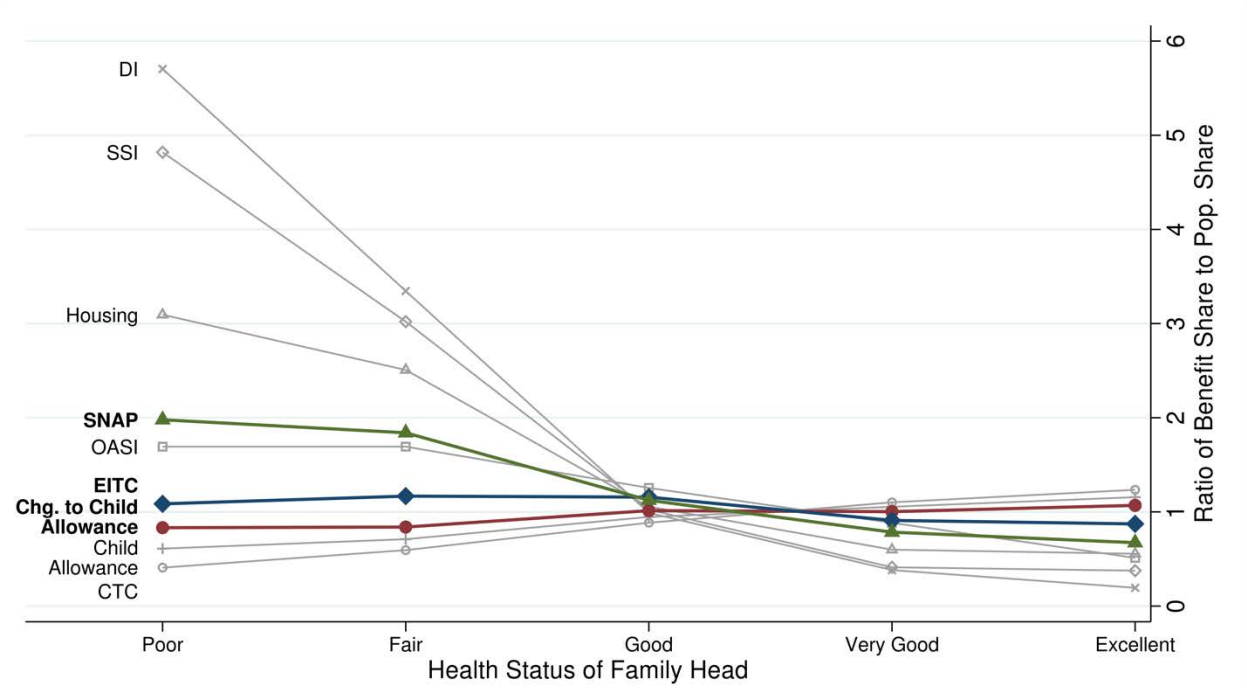
**Figure A6. Share of Total Program Dollars Received by Educational Attainment of Family Head, CID**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: This figure shows shares of total program dollars received relative to shares of total population by educational attainment of family head. Administrative data are used for all programs. The child allowance uses the CID-based child allowance simulation with assumed 75% take-up among non-filers. SNAP estimates are calculated using the subset of states for which administrative SNAP data are available. We drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024.

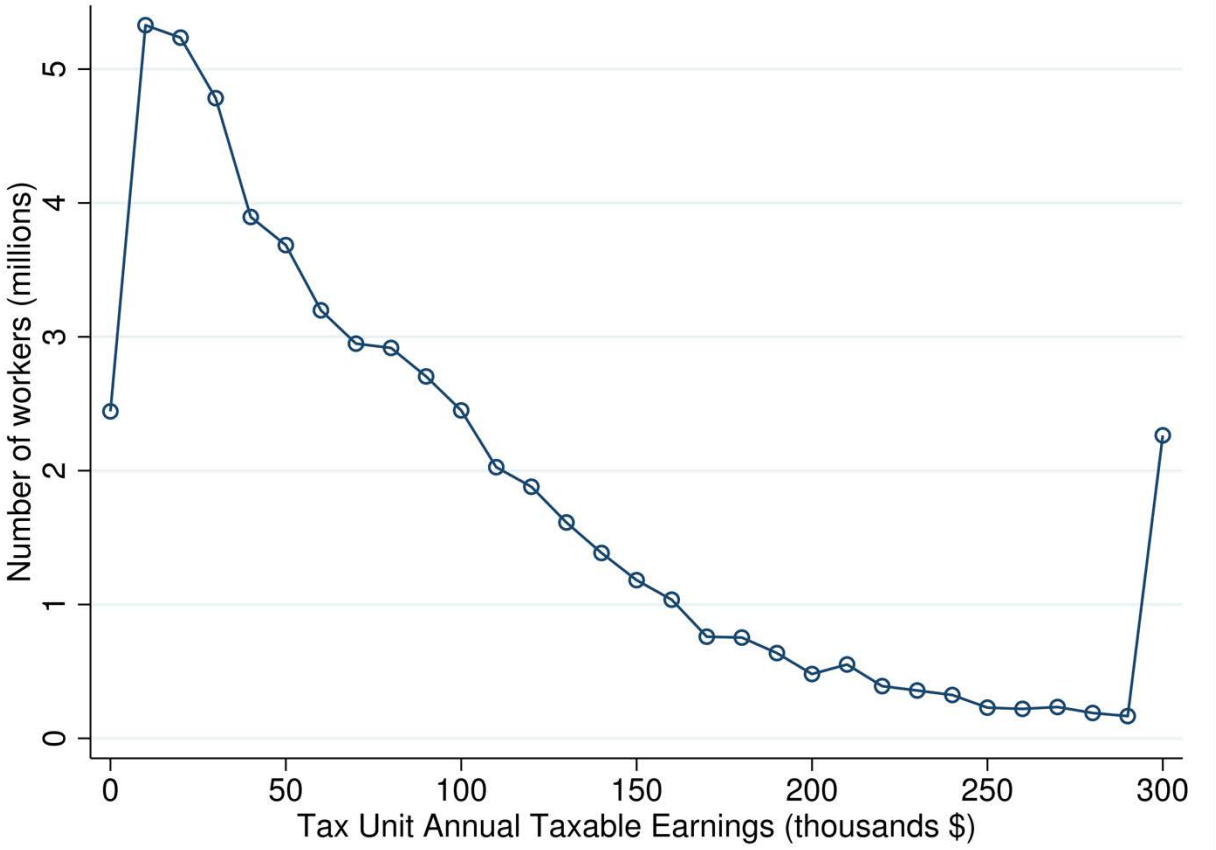
**Figure A7. Share of Total Program Dollars Received by Health Status of Family Head, CID**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: This figure shows shares of total program dollars received relative to shares of total population by self-reported health status of family head. Administrative data are used for all programs. The child allowance uses the CID-based child allowance simulation with assumed 75% take-up among non-filers. SNAP estimates are calculated using the subset of states for which administrative SNAP data are available. We drop non-PIKed and whole imputed families in the CPS, adjusting survey weights using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-024.

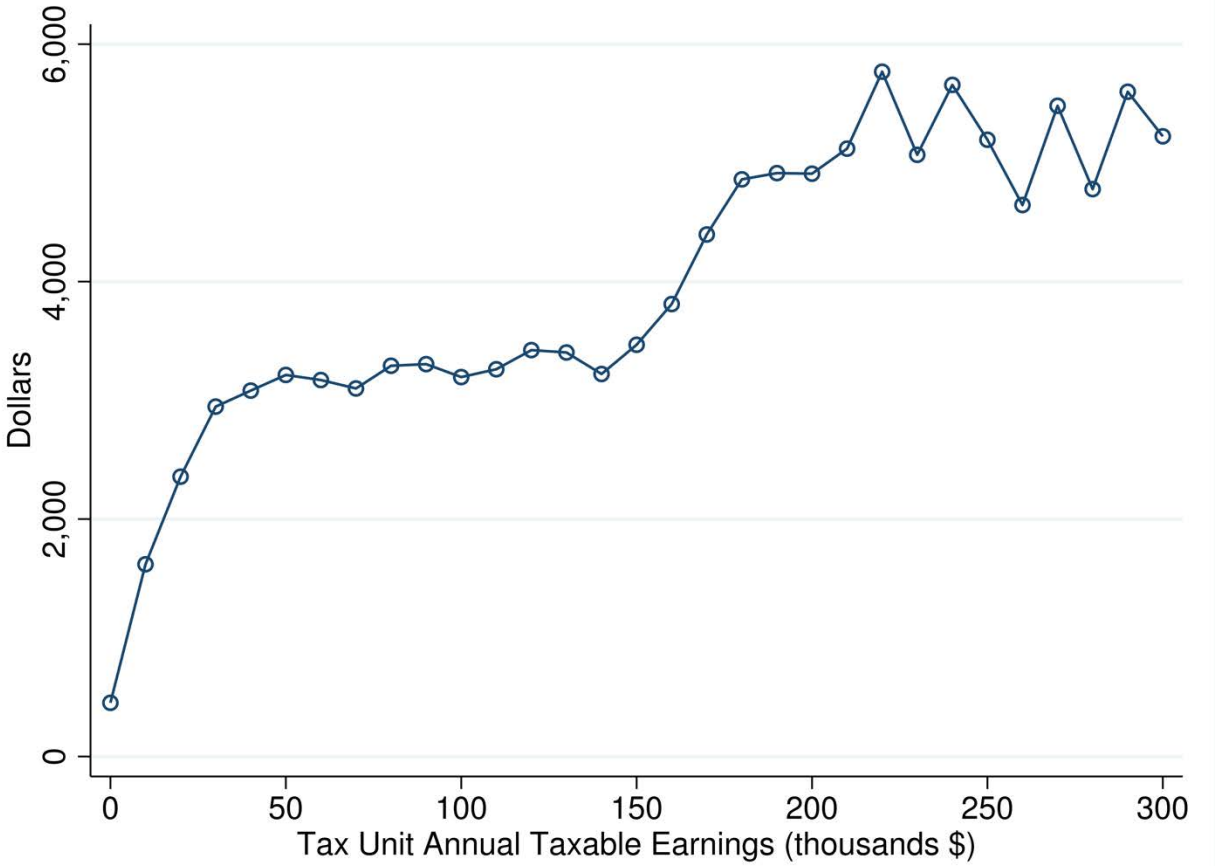
**Figure A8. Number of Working Adults with Children, by Tax Unit Earnings**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM

Notes: Working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Tax unit earnings are reported in $10,000 bins. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

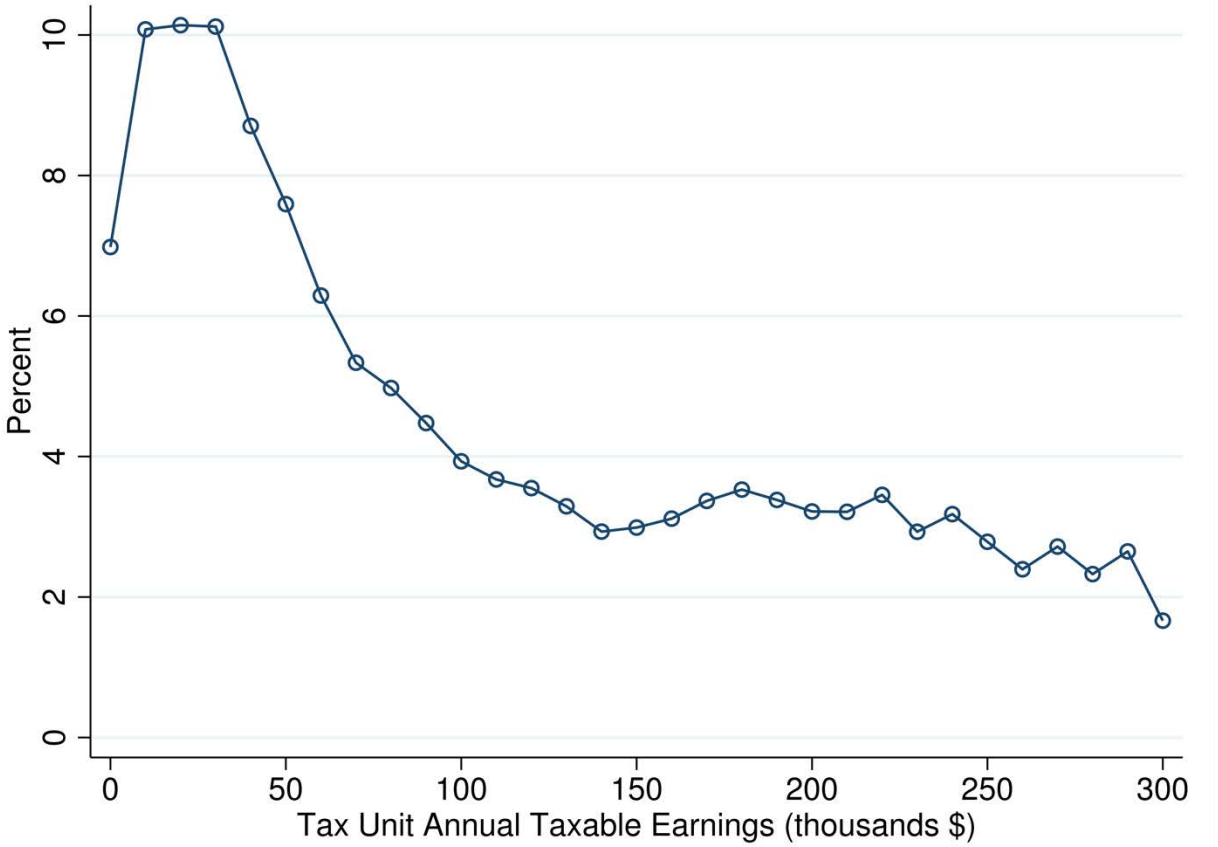
**Figure A9. Mean Decrease in the Return to Work due to the Replacement of the Child Tax Credit with a Child Allowance Among Working Adults with Children, by Tax Unit Earnings**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: The decrease in the return to work due to the replacement of the CTC with a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). Working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Tax unit earnings are reported in $10,000 bins. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

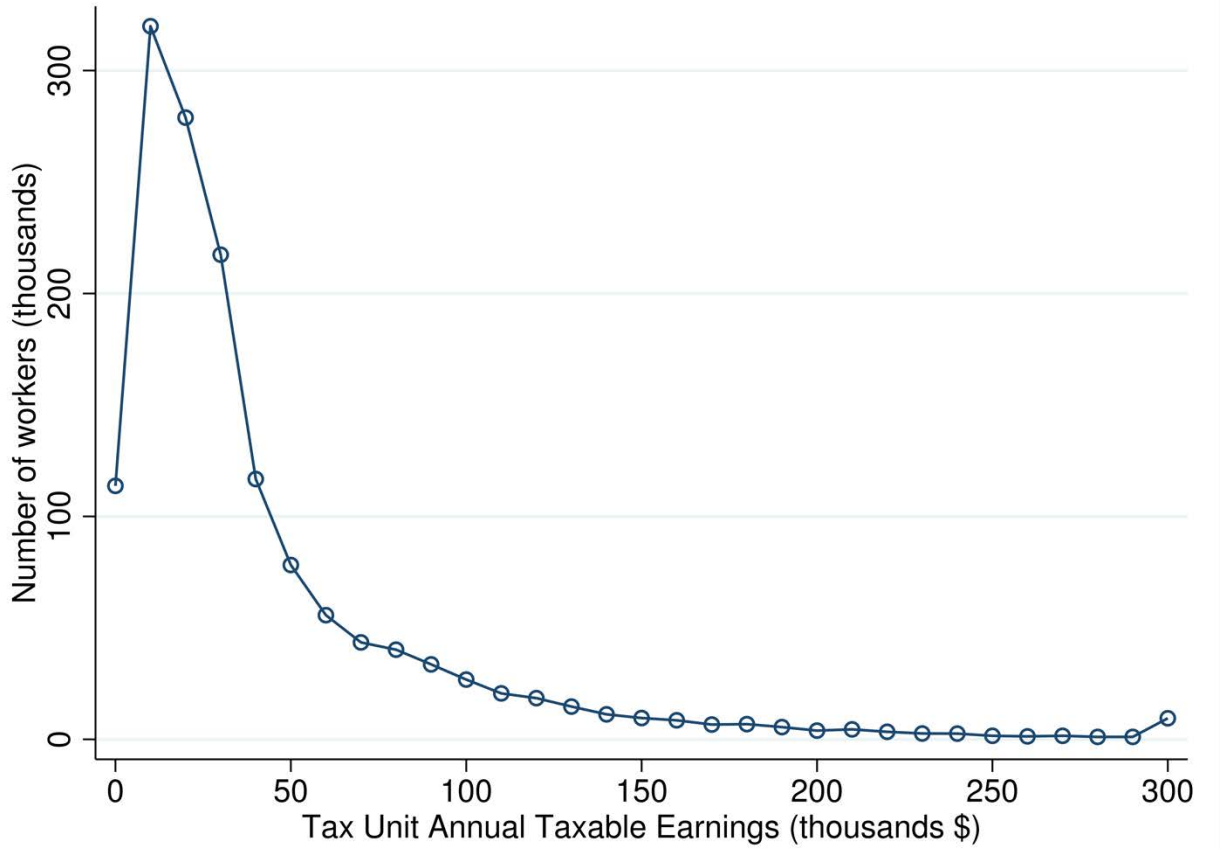
**Figure A10. Mean Decrease in the Return to Work due to the Replacement of the Child Tax Credit with a Child Allowance as a Share of the Return to Work Under the Child Tax Credit Among Working Adults with Children, by Tax Unit Earnings**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: Figure shows the mean of the ratios of the decrease in return to work to baseline return to work. The decrease in the return to work due to the replacement of the CTC with a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). The baseline return to work is earnings net of tax liability and reduced transfer benefits from working. Working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Tax unit earnings are reported in $10,000 bins. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

**Figure A11. Number of Working Adults with Children Exiting Labor Force due to Replacement of the Child Tax Credit with a Child Allowance, by Tax Unit Earnings**




Source: 2017 CPS ASEC (adjusted to 2022 levels using changes in prices and benefits) linked to administrative IRS and program records, TAXSIM.

Notes: Estimates are based on simulations of the replacement of the CTC with a child allowance for 2022. The substitution effect estimates apply elasticities of 0.75 for single mothers receiving EITC benefits and 0.25 for other workers to percent decrease in the return to work. Percent decrease in the return to work is the decrease in the return to work divided by the baseline return to work among currently working parents. The baseline return to work is earnings net of tax liability and reduced transfer benefits from working. The decrease in the return to work due to the change to a child allowance is the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). The income effect estimates apply elasticities of 0.085 for single mothers receiving EITC benefits and 0.05 for other workers to the percent increase in income. The percent increase in income is the increase in CTC benefits from the TCJA to the AFP CTC divided by family post-tax and post-transfer income. A working adult with children is any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016. Exit probabilities due to income and substitution effects are modeled additively. All workers in a tax unit are modeled as both remaining or both exiting the labor force. Our sample consists of all individuals in PIKed and non-whole imputed families, with survey weights adjusted for non-PIKing and whole imputes using inverse probability weighting. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release, authorization number: CBDRB-FY2021-CES005-028.

# Appendix A: Employment Participation Elasticities from the Earned Income Tax Credit Literature

In this appendix, we show that the choice of a 0.75 employment participation elasticity for single mothers is supported by the EITC literature, and in fact is lower than that implied by some of the most notable studies. We first briefly recount other summaries of the magnitude of the participation elasticity for single mothers, which each suggest an elasticity of around 0.75. Next we turn to four individual studies of the responsiveness of employment participation to the return to work.

We focus on Hoynes and Patel (2018a), which is recent and was used as the basis for simulations by the 2019 National Academy of Sciences (NAS) report on reducing child poverty (NAS 2019). Based on Hoynes and Patel (2018a), a $1,000 increase in average EITC benefits increases employment participation among single mothers by 5.1 percentage points and implies a participation elasticity of 1.25 (see Table A-1). Based on an appropriately adjusted estimate from Schanzenbach and Strain (2020), a $1,000 increase in average EITC benefits increases employment participation among single mothers by 3.2 percentage points and implies a participation elasticity of 0.85. Meyer and Rosenbaum (2001) estimate that a $1,000 increase in average EITC benefits increases employment participation by a slightly lower 2.9 percentage points and implies a participation elasticity of 0.67. Finally, an appropriately adjusted estimate from Keane and Moffitt (1998) implies that a $1,000 increase in average EITC benefits increases employment participation by a much higher 7.5 percentage points and implies a participation elasticity of 1.68. Thus, the 0.75 elasticity used for EITC recipient single mothers in Corinth et al. (2021) is either similar to or more conservative than estimates based on these notable studies.

**Table A-1. Change in Probability of Employment Participation During the Year among Single Mothers Due to $1,000 Increase in Earned Income Tax Credit Benefit, and Employment Participation Elasticity, Select Studies**

| | Change in probability of employment participation during year | | |
|---|---|---|---|
| | Unadjusted value based on $1,000 increase in study base year dollars | Adjusted value based on $1,000 increase in 2021 dollars | Employment Participation Elasticity |
| Hoynes and Patel (2018a) | 0.056 | 0.051 | 1.25 |
| Schanzenbach and Strain (2020) | 0.019[a] | 0.032[b] | 0.85 |
| Meyer and Rosenbaum (2001) | 0.045 | 0.029 | 0.67 |
| Keane and Moffitt (1998) | 0.074[a] | 0.075[b] | 1.68 |

Source: Hoynes and Patel (2018b), Appendix Table 7; Schanzenbach and Strain (2020), Table 5, Appendix Table A1; Meyer and Rosenbaum (2000), Table 2; Meyer and Rosenbaum (2001), Table 2, Table 4; Keane and Moffitt (1998), Table 7; authors' calculations

Note: Adjusted values of the change in the probability of employment consider a $1,000 increase in average EITC benefits in 2021 dollars, updated based on the personal consumption expenditure price index. Employment participation elasticity is equal to the percent change in the probability of employment divided by the percent change in the return to work. The percent change in the probability of employment is equal to the change in the probability of employment participation during the year due to a $1,000 increase in average EITC benefits (in the study's base year dollars) divided by the baseline employment rate. The percent change in the return to work is equal to $1,000 divided by the baseline return to work (in the study's base year dollars). See text for further details.

[a] Unadjusted value based on $1,000 increase in maximum EITC benefits and, in the case of Keane and Moffitt (1998), employment during the month.

[b] In addition to adjusting to 2021 dollars, we increase the Schanzenbach and Strain (2020) value by 73% to adjust for their use of maximum EITC benefits rather than average EITC benefits. We increase the Keane and Moffitt (1998) value by 73% to adjust for their use of maximum EITC benefits, and by 32% to adjust for their employment period of a month instead of year. See text for further details.

Below, we recount other summaries of the employment participation elasticity for single mothers. Then we describe in more detail the employment participation response to a change in EITC benefits for each of the four studies shown in Table A-1. We conclude by showing how our employment participation elasticities appear to be lower than those implied by simulations in NAS (2019).

While it should be evident that there are many different participation elasticities we could calculate, we focus on those most relevant to the proposed changes in the CTC. Because the CTC is determined by employment over a calendar year, we focus on the effect of taxes on employment at all during a year. We also include a value for food stamps/Supplemental Nutrition Assistance Program benefits and housing benefits in the return to work, but not a value of Medicaid or other health insurance. The related literature tends to find that the low-income population often values Medicaid at a small fraction of its cost (Keane and Moffitt 1998; Meyer and Rosenbaum 2001; Finkelstein, Hendren, and Luttmer 2019; Finkelstein, Hendren, and Shepard 2019).

**Summaries of elasticities**

Summaries of the literature on labor supply responses by single mothers to the EITC have concluded that single mothers are responsive to the return to work, with a participation elasticity similar to the 0.75 baseline value we use in this paper. In a Congressional Budget Office working paper, McClelland and Mok (2012) conclude that participation elasticities for lower-income workers eligible for the EITC range from 0.3 to 1.2. The midpoint of this range is 0.75. Gelber and Mitchell (2012) write that participation elasticities for single mothers range from "0.35 to 1.7, with a central tendency of 0.7" (p. 873). Nichols and Rothstein (2016) state that "consensus estimates of the extensive-margin elasticity [are] around 0.7 to 1.0" (p. 198). Goldin, Maag, and Michelmore (2021) echo this conclusion of Nichols and Rothstein (2016), noting that participation elasticities "approach 0.70 to 1.00 for single mothers" (p. 7).

**Hoynes and Patel (2018a)**

Hoynes and Patel (2018a) is important to consider individually because it was used as the basis for simulations in the 2019 NAS report on reducing child poverty (NAS 2019). Hoynes and Patel (2018a) estimate that a $1,000 increase in federal EITC benefits (in 2016 dollars) increases employment participation among single mothers during the year by 5.6 percentage points (see final column of their Appendix Table 7).[1] A $1,000 increase in 2021 dollars would increase participation by 5.1 percentage points. We focus on this particular estimate because it was the estimate used by NAS (2019) to simulate the labor supply effects of an expansion of EITC benefits.

We do not rely on the elasticity estimates reported in Hoynes and Patel (2018b) because they do not seem consistent with their estimated employment effect with respect to an increase in EITC

[1] Appendix Table 7 in Hoynes and Patel (2018b) does not indicate the year in which dollar amounts are expressed, but we note that Appendix Figure 1 is expressed in 2016 dollars, and Appendix Figure 2 is expressed in 2014 dollars. We obtain an adjusted estimate of 5.1 percentage points when converting to 2021 dollars regardless of whether we use 2014 or 2016 as the base year.

benefits. To see this, note that the standard formula for the elasticity of employment participation with respect to a change in the return to work is

$$\epsilon = \frac{\%\ change\ in\ employment}{\%\ change\ in\ return\ to\ work}$$

The elasticity reported in the final column of Appendix Table 7 is 0.32. The percent change in employment participation due to a $1,000 increase in federal EITC benefits (in 2016 dollars, reported in Appendix Table 7) is 0.07. The percent change in the return to work is the dollar change in the return to work ($1,000) divided by the baseline return to work. We can plug these values into the equation above to back out the implied baseline return to work $b$.

$$0.32 = \frac{0.07}{1{,}000/b}$$

Solving for $b$, we see that the baseline return to work is $4,571 (in 2016 dollars). This value seems implausibly low. Meyer and Rosenbaum (2000) estimate that the average return to work for single mothers in 1996 was $17,895 (in 2016 dollars).[2] Using this value as the baseline return to work yields an elasticity of 1.25. Because Hoynes and Patel (2018b) calculate their elasticities in a nonstandard way and do not report the means that are inputs into their calculations, it is not clear why their reported elasticities are much lower.[3]

**Schanzenbach and Strain (2020)**

In a study of all EITC expansions since the program was introduced in 1975, Schanzenbach and Strain (2020) estimate that a $1,000 (in 2019 dollars) increase in maximum federal and state EITC benefits increases the probability of single mothers working during the year by 1.9 percentage points (see their Table 5). In 2021 dollars, a $1,000 increase in maximum EITC benefits increases the probability of employment by 1.8 percentage points.

The effect of increasing the average EITC benefit would be larger than the effect of increasing the maximum EITC benefit. Between 1990 and 1996, the maximum EITC benefit for one-child families increased by $1,038 (in 1996 dollars), 1.73 times the $601 (in 1996 dollars) decrease in taxes paid by single mothers with one child and average earnings over this period, driven by the EITC expansion (Meyer and Rosenbaum 2000; Tax Policy Center 2021). The maximum EITC benefit for two or more child families increased by $2,442 (in 1996 dollars), 1.80 times the $1,356 (in 1996 dollars) decrease in taxes paid by single mothers with two or more children and average earnings (Meyer and Rosenbaum 2000; Tax Policy Center 2021).[4] Thus, the effect on employment of increasing the average EITC benefit by $1,000 should be at least 1.73 times the effect of increasing the maximum EITC benefit by $1,000. Applying this adjustment factor, a $1,000 increase in average EITC benefits increases participation in employment by 3.2 percentage points.

[2] To be consistent with the Hoynes and Patel (2018a) income definition, the return to work values from Meyer and Rosenbaum (2000) exclude the value of Medicaid.

[3] In the equation on page 3 of the appendix, it is unclear whether the employment change estimate in the numerator is defined consistently with the change in the return to work in the denominator.

[4] This calculation likely underestimates how much we should scale up the elasticity because the average EITC benefit will be less than the benefit evaluated at average earnings given the concavity of the EITC schedule.

We next calculate the employment participation elasticity implied by Schanzenbach and Strain (2020). We calculate the percent change in employment as the adjusted change in the probability of employment (0.033) due to a $1,000 increase in average EITC benefits (in 2019 dollars), divided by the 1989-1998 mean employment rate for single mothers of 0.73 reported in Appendix Table A1 of Schanzenbach and Strain (2020). The percent change in the return to work is $1,000 divided by the return to work for single mothers, which we take as the average return to work in 1996 taken from Table 2 of Meyer and Rosenbaum (2000) and inflated to 2019 dollars, for a value of $18,869. The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 0.85.

Schanzenbach and Strain (2020) separately consider single mothers with a high school diploma or less. Using the same methodology above except relying on the Schanzenbach and Strain (2020) employment estimates for this subpopulation, a $1,000 increase in average EITC benefits increases participation in employment by 4.8 percentage points for these lower educated single mothers. Their implied employment participation elasticity is 1.45.

**Meyer and Rosenbaum (2001)**

Meyer and Rosenbaum (2001) estimate the change in employment participation among single mothers in response to expansion of the EITC in the 1980s and 1990s. In their Table IV, they report that a $1,000 increase in the return to work (due to a $1,000 decrease in taxes, driven by an expansion of the EITC) would increase employment participation during the year among single mothers by 4.5 percentage points. Converting the $1,000 increase in the return to work to 2021 dollars, the estimate is 2.9 percentage points. This estimate is similar to the 3.2 percentage point effect from Schanzenbach and Strain (2020).

The implied employment participation elasticity based on Meyer and Rosenbaum (2001) is similar as well. The percent change in employment is equal to the change in the probability of employment due to a $1,000 increase in average EITC benefits (in 1996 dollars), 0.045, divided by the baseline employment rate, 0.78, the average of the single mother employment rate in 1984 and 1996 (the first and last year of the study period in Meyer and Rosenbaum 2001). The percent change in the return to work is $1,000 divided by the baseline return to work, $11,531 (in 1996 dollars), the average of the baseline return to work in 1984 and 1996 reported in Meyer and Rosenbaum (2000). The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 0.67.[5]

**Keane and Moffitt (1998)**

In a final study that estimates the effect of the EITC on labor supply, Keane and Moffitt (1998) simulate the change in the probability of working in a given month among single mothers due an increase in the maximum EITC benefit. In their Table 7, they report that the probability of not working falls from 34.6% at baseline to 27.2% after an increase in the maximum EITC benefit from $500 (its 1984 level) to $1,500.[6] Thus, increasing the maximum EITC benefit by $1,000 in 1984 dollars increases participation in employment among single mothers by 7.4 percentage points

[5] Nichols and Rothstein (2016) note that the implied elasticity from Meyer and Rosenbaum (2001) is about 0.7.

[6] Keane and Moffitt (1998) consider a policy of increasing maximum EITC benefits from $500 to $1,500, increasing the phase-in rate from 10% to 30%, and increasing the phase-out rate from 12.5% to 20%. See Tax Policy Center (2021) for a history of EITC parameters from 1975 to 2001.

(the difference between 34.6% and 27.2%). Adjusted for inflation, increasing the maximum EITC benefit by $1,000 (in 2021 dollars) would increase participation in employment by 3.3 percentage points. The effect of increasing the average EITC benefit would be larger than the effect of increasing the maximum EITC benefit. Applying the same 1.73 adjust factor previously derived, a $1,000 increase in average EITC benefits increases participation in employment by 5.7 percentage points.

We would expect the employment participation effect to be even larger if the authors had instead considered employment at any point during the year, as considered by Hoynes and Patel (2018a), Schanzenbach and Strain (2020) and Meyer and Rosenbaum (2001), rather than at any point during the month. Meyer and Rosenbaum (2001) find that the responsiveness to the return to work is 64% higher when considering work during the year rather than work during a given week. Thus, we would expect the estimate for employment during the year to be between 0% and 64% higher than the Keane and Moffitt (1998) estimate for employment during the month. We take the midpoint of 32% and thus adjust their effect upward to 7.5 percentage points.

We also calculate the employment participation elasticity implied by Keane and Moffitt (1998). First we adjust upward the change in the probability of employment due to a $1,000 increase in maximum EITC benefits (in the study's 1984 baseline dollars) by 73% to convert to an increase in average benefits, and by an additional 32% to account for consideration of employment during a year rather than a month as discussed earlier. We calculate the percent change in employment as the adjusted change in the probability of employment (0.169) divided by the 1984 employment rate for single mothers of 0.73 reported in Table 2 of Meyer and Rosenbaum (2001). The percent change in the return to work is $1,000 divided by the return to work for single mothers in 1984 (in 1984 dollars), of $7,284, taken from Table 2 of Meyer and Rosenbaum (2000) and then deflated. The participation elasticity—the percent change in employment divided by the percent change in the return to work—is 1.68.

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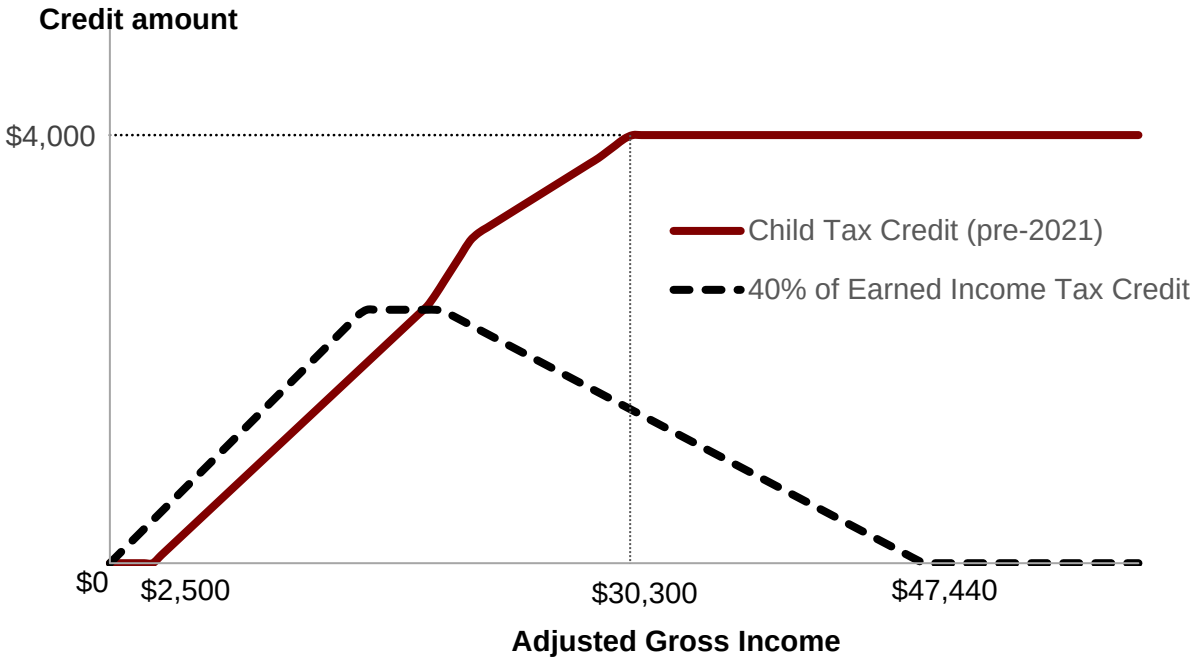
# Appendix B: Applying the NAS Methods to Directly Estimate Labor Supply Effects of CTC Changes

In this appendix we show that when simulating the effects of the Earned Income Tax Credit (EITC), the NAS Committee assumed a responsiveness to work incentives that implies an employment effect of the change to a child allowance in the range we find in our paper. Specifically, the NAS Committee devoted a full section to simulating the effects of a 40% increase in EITC benefits, which they estimated would increase employment by almost 800,000 single mothers. Figure B-1 compares a 40% increase in EITC benefits (dashed black line) to the CTC in effect through 2020 (maroon line) for a single parent with two children. Since the CTC benefit level is similar to or much higher than 40% of the EITC at any given earnings level, its effect on participation in employment must be similar or higher regardless of how much an individual would earn when working. Thus, on the face of it this figure shows that NAS cannot be right that the elimination of the 2020 law CTC would do little to decrease employment, unless they believe their EITC simulations are in error.

**Figure B-1. Child Tax Credit, and 40% of the Earned Income Tax Credit by Adjusted Gross Income Using Tax Cuts and Jobs Act Rules, Single Parent with Two Children Under Age 17**




Notes: Child Tax Credit (CTC) and Earned Income Tax Credit (EITC) parameters are based on Tax Cuts and Jobs Act rules as of 2020 (all dollar values expressed in 2020 nominal terms). See Corinth et al. (2021) for details.

We calculate in Table B-1 the employment reduction the NAS Committee would have found for the child allowance if it applied the same employment response it used to model a 40% increase in the EITC. Of the four values used in our calculation of the employment reduction, three are taken directly from the NAS Committee's report, and the other value we estimate from public use data. The first term, 0.056, is the estimated percentage point increase in the single mother employment rate when the return to work increases by $1,000 in 2013 dollars (NAS 2019, p. 413).

We multiply this effect by the mean decrease in the return to work (in thousands of 2013 dollars) among working single mothers due to the change to a child allowance, $2.048, which we estimate using the public use 2019 CPS ASEC (see the appendix for the data and code used to generate this estimate).[1] Note that this dollar amount is just the height of the subsidy in Figure B-1, averaged across incomes and family sizes. The product of these first two terms represents the percentage point decrease in the employment rate among single mothers due to the decrease in the return to work from the change to a child allowance. We multiply this product by the NAS Committee's reported 10.14 million single mothers who are non-disabled, are not enrolled in school, and have a child under age 18 (NAS 2019, p. 488). Finally, we add the 0.15 million workers the NAS Committee estimates would exit the workforce due to the income effect from the proposed CTC changes (NAS 2019, p. 550). Altogether, applying the Committee's parameter and population estimates implies that at least 1.31 million workers would exit the workforce due to the proposed CTC changes, even if we assume no employment response due to weakened work incentives for single fathers or married parents.

This lower bound employment effect of 1.31 million implied by the NAS Committee methods when recognizing the change in work incentives of the change to a child allowance is only modestly lower than the 1.46 million estimate in our paper, and it would be higher once a reasonable employment response from single fathers and married couples is included. This result is consistent with our analysis that the employment participation elasticities we apply in our paper are similar to or more conservative than those found in the academic literature (see Appendix A). Thus, the NAS methods—when applied consistently—lead to an employment loss as large as we estimate.

**Table B-1. Millions of parents exiting workforce due to replacing CTC with child allowance, lower bound estimate implied by NAS Committee report**

| Value | Definition | Source |
|---|---|---|
| 0.056 | Percentage point increase in employment per $1,000 increase in return to work | NAS (2019, p. 413) |
| × | | |
| 2.048 | Mean decrease in return to work among single mothers due to change to child allowance, in thousands $ | Our estimate |
| × | | |
| 10.14 | Millions of single mothers who are non-disabled, not enrolled in school and have child under 18 | NAS (2019, p. 488) |
| + | | |
| 0.15 | Millions of parents exiting workforce due to income effect | NAS (2019, p. 550) |
| **1.31** | **Millions of parents exiting workforce** | |

Source: NAS (2019); 2019 Current Population Survey; Bureau of Labor Statistics; Authors' calculations
Notes: With the exception of the mean decrease in return to work and the 1.31 million lower bound employment loss estimate, all values are taken directly from NAS (2019) on the indicated page number. The mean decrease in return to work is calculated from the public use 2019 Current Population Survey Annual Social and Economic Supplement:

[1] It is not clear whether the NAS Committee in their EITC expansion simulation restricted their sample to EITC recipient single mothers to calculate the mean increase in the return to work. When we restrict the sample to working single mothers who receive the EITC, the mean decrease in the return to work due to eliminating the pre-2021 CTC is $1.987 (in thousands of dollars). The total number of parents exiting the workforce implied by the NAS assumptions would then fall slightly to 1.28 million.

See appendix for the brief description of our calculation. Dollar values are expressed in 2013 dollars for consistency with NAS (2019).

## Addendum

This addendum describes our calculation of the mean decrease in the return to work for working single mothers (and EITC recipient working single mothers) from the elimination of the TCJA CTC.[2] We downloaded the relevant variables from the 2019 CPS ASEC from IPUMS-CPS (Flood et al. 2020), and we calculated the mean CTC amount (refundable and non-refundable) received by each working single mother with at least one child under the age of 18. We converted this 2018 dollar value into 2013 dollars based on the Chained-Consumer Price Index for all Urban Consumers. The STATA code is reproduced below.

```
**Read in relevant variables from 2019 CPS ASEC**
use <DATASET NAME>, clear

**Recode non-refundable CTC and refundable CTC and calculate total CTC**
recode ctccrd (999999=0), gen(ctc_non)
recode actccrd (99999=0), gen(ctc_ref)
gen ctc = ctc_non + ctc_ref

**Adjust to 2013 dolllars using C-CPI-U. Source: https://fred.stlouisfed.org/series/SUUR0000SA0**
replace ctc = ctc * 132.137 / 140.239

**Mean CTC for all working single mothers**
sum ctc if sex==2 & marst!=1 & workly==2 & yngch>=0 & yngch<18 [aweight=asecwt]

**Mean CTC for all working single mothers receiving EITC**
sum ctc if sex==2 & eitcred>0 & eitcred<9999 & marst!=1 & workly==2 & yngch>=0 & yngch<18 [aweight=asecwt]
```

[2] In order to make our calculation as simple and transparent as possible, we adopt a simplified methodology that assumes the decrease in the return to work is equal to the pre-2021 CTC itself. In rare cases, a working single mother could have enough unearned income that would allow her to claim the pre-2021 CTC even if she stopped working, and thus, her decrease in the return to work could be smaller than her full pre-2021 CTC benefit.

# Appendix C: Allocating CTC benefits to complex families

This appendix describes how we allocate CTC and child allowance benefits to families, with a focus on the less straightforward case of complex families—where surveyed adults claim children outside of the surveyed adult's family, and where surveyed children are claimed by adults outside of the surveyed child's family.

Our approach for allocating the CTC and child allowance in general (both in non-complex families and complex families) can be outlined as follows:

1. In the most straightforward cases, the survey children include all of those listed on the returns of the adults either in or outside the family. In that case, all benefit dollars go to the children in question.
2. In the case when one or more of the tax returns includes children not in the surveyed family, benefits must be prorated so that only part of the benefit is allocated to the children in the surveyed family.
3. Surveyed dependents who do not appear on any 1040 are assumed to receive benefits if there is a survey adult to claim them. We assume that the child allowance can be received by children who do not appear on a 1040 even if there is no survey adult to claim them.

The remainder of this appendix describes our methodology for prorating the CTC and child allowance when the dependents on the 1040 are not a subset of the dependents in a surveyed family. Our strategy is to prorate benefits based on the number of claimed dependent children that appear in the survey sharing unit. We implement this adjustment of total benefits when simulating the CTC and the child allowance.[1] Note that we assign all other taxes and tax credits (including the Earned Income Tax Credit and the Child and Dependent Care Tax Credit) to the sharing unit of the surveyed primary/secondary filer only.

**Implementing Our Approach**

We implement our approach in two steps. First, we calculate the total amount of each credit pertaining to the 1040. Second, we calculate the share of the total amount of each credit that should be allocated to the survey sharing unit.

*Step 1. Calculate the total amount of CTC and child allowance pertaining to the 1040*

We consider separately the CTC and the child allowance. For both of these benefits, the amount that can be claimed on behalf of each dependent varies by the age category of the dependent (under 17 vs. 17+ for the CTC and under 6 vs. 6-17 vs. 18+ for the child allowance). Thus, we split the total amount of each benefit into the total amounts claimed for each age category. This allows us in Step 2 to accurately prorate the total benefit amount based on both the share and age composition of 1040 dependents who appear in the surveyed SPM unit.

*CTC*. The CTC contains the following components:

For dependents under age 17

- Non-refundable CTC (with maximum benefit of $2,000 per dependent)

[1] For the CTC, we subtract out the amount for "non-resident" 1040 dependents in proportion to the share of 1040 dependents who do not appear in the survey. For the child allowance, we subtract out the age-specific amounts for "non-resident" 1040 dependents.

- Additional CTC (ACTC, refundable portion of the CTC with maximum benefit of $1,400 per dependent)

For dependents aged 17+

- Non-refundable ODC (with maximum benefit of $500 per dependent)

While TAXSIM reports the ACTC as a separate output, it unfortunately aggregates the non-refundable CTC and ODC into a single output ("combined non-refundable CTC") for each tax unit. Thus, we must split this aggregated amount between these two benefits outside of TAXSIM. To do so, we use the IRS rule that the non-refundable ODC is applied before the non-refundable CTC when calculating non-refundable tax credits.[2] We first calculate the total non-refundable ODC for the tax unit as the minimum of (i) the total amount of the "combined non-refundable CTC" outputted by TAXSIM and (ii) $500 times the number of dependents aged 17+ on the 1040. We then calculate the total non-refundable CTC for the tax unit as any remaining amount of the "combined non-refundable CTC" after subtracting out the non-refundable ODC.

*Child Allowance*. The child allowance contains the following components:

For dependents under age 6

- Fully refundable amount, with maximum benefit of $3,600 per dependent

For dependents aged 6-17

- Fully refundable amount, with maximum benefit of $3,000 per dependent

For dependents age 18+

- Non-refundable ODC, with maximum benefit of $500 per dependent

We calculate the total benefit amount for dependents aged 0 to 5 (6 to 17) as $3,600 ($3,000) times the number of dependents aged 0 to 5 (6 to 17) on the 1040, appropriately phased out based on AGI on the 1040. We calculate the total ODC amount as equivalent to the total tax liability (prior to credits) based on the 1040 (calculated by TAXSIM), up to a maximum of $500 times the number of dependents aged 18+ on the 1040. The ODC is appropriately phased out based on AGI on the 1040.

*Step 2. Prorate the total amount of each credit based on the number and age composition of 1040 dependents appearing in the survey sharing unit*

In this step, we prorate the total amount of each benefit calculated in Step 1 (split across dependent age categories) based on the share of 1040 qualifying dependents for each credit who appear in the survey sharing unit (split across age categories).

The denominators for these shares are the numbers of dependents on the 1040 in the following age categories for each credit:

*CTC*

Dependents under age 17

- Claimed for the non-refundable CTC and ACTC

Dependents aged 17+

- Claimed for the non-refundable ODC

[2] See Internal Revenue Service (IRS) documentation, https://www.irs.gov/irm/part21/irm_21-006-003r.

*Child allowance*
Dependents aged 0 to 5

- Claimed for the fully refundable amount for dependents age 0 to 5

Dependents aged 6 to 17

- Claimed for the fully refundable amount for dependents age 6 to 17

Dependents aged 18+

- Claimed for the non-refundable ODC[3]

The numerators for these shares are the numbers of dependents on the 1040 in each age category who appear in the surveyed family. We add the prorated share of each specific amount to the income of the surveyed family.

[3] The proration of the ODC under the child allowance is different from the proration of the ODC under the CTC. Between the two scenarios, the total amount of ODC awarded changes and the number of ODC dependents changes (due to changes in age eligibility for the ODC).

# Appendix D: Discrepancy between children represented by the CPS and children who can potentially be claimed for benefits

This appendix describes the discrepancy between the number of children represented by the CPS ASEC and the number of children who can potentially be claimed as a dependent for purposes of the CTC and child allowance. It also describes the implications this discrepancy for our aggregate estimates of CTC and child allowance spending.

In the CID, we only assign benefits to children in the survey frame, who are weighted to represent the total non-institutionalized population of children living in the United States. However, children outside of the non-institutionalized population (as represented by the CPS ASEC) can potentially be claimed as a dependent for purposes of the CTC and child allowance. In 2016, there were an estimated 129,100 children in institutional group quarters, 2.5 million children with Social Security numbers living outside of the United States, and an estimated 1.5 million children not represented by the CPS ASEC population benchmark due to an undercount of the non-institutionalized population.

With regard to the latter group, CPS ASEC benchmarks are derived from population totals in the most recent Decennial Census. The Census Bureau estimated that the net undercount (i.e., gross omissions net of erroneous enumerations and whole person imputations) of children ages 0-11 was 1.5 million in the 2010 Decennial Census (Census Bureau 2014). This cohort corresponds to children ages 6-17 in 2016. Children ages 0-5 in 2016 were all born after the 2010 Census, so their contribution to the population benchmark is not affected by the Census undercount.

Thus, while the CPS ASEC captures 74.0 million children in 2017, there are an estimated 78.0 million with Social Security numbers who potentially could be claimed on a 1040 for purposes of the CTC and child allowance. If the additional 4.0 million children not captured by the CPS ASEC have a similar expected benefit as children represented by the CPS ASEC, then we would expect aggregate CTC and child allowance payments in the CID to be approximately 95% of aggregate CTC and child allowance payments according to administrative aggregates. Thus, children not represented by the CPS ASEC but nonetheless eligible for the TCJA CTC can explain the finding that we capture 94% of CTC dollars in the CID.

At the same time, we may slightly overstate CTC and child allowance spending for another reason—we drop children living in families without any PIKed family member. These children who we drop are unlikely to have benefits claimed on their behalf because qualifying dependents must have a Social Security number. However, we then upweight other families with at least one PIKed family member such that the weighted total number of children represented by the CPS ASEC is unchanged. Effectively, this means we could give higher weight to children who are more likely to receive the CTC given that they are more likely to have a Social Security number. However, because we use covariates to determine who to upweight, we are likely to increase the weights of children who also do not receive the CTC. Because the children we upweight to "take the place" of children dropped from the sample likely have similar CTC amounts, this issue does not likely lead to substantial overstatement of CTC spending.

# Appendix E: Methodology for dynamic simulation of CTC expansion

This appendix describes our methodology for simulating the effect of replacing the CTC with a child allowance on labor supply and incorporating labor supply reductions into our poverty simulations. We do not account for reductions in hours worked for workers who face an increased implicit marginal tax on an extra dollar of earnings due to the change to a child allowance—this includes workers on the phase-in portion of the CTC or the phase-out portion of the child allowance.

**Effect of change to child allowance on labor force participation**

Relative to the CTC, the change to a child allowance would reduce the incentive to work for most workers with children. Under the CTC, individuals receive up to $2,000 per child only if they work (or have a nonzero tax liability from other income sources). For example, a worker with two children receives up to $4,000 if she works, and $0 if she does not work and has no tax liability. Under the child allowance, workers receive no *additional* benefit amount as a result of working. Thus, the reduction in the return to work under the child allowance (relative to the CTC) will lead to a decrease in the number of workers as a result of the change to a child allowance.

In order to estimate the reduction in participation in the labor force, we apply from the academic literature elasticities of participation, which indicate the percent change in the probability of participation due to a one percent change in the return to work. Letting $\epsilon$ denote the elasticity, the percent change in the probability of working is equal to $\epsilon$ times the percent change in the return to work. We consider the work decisions of each tax unit with at least one current worker,[4] assuming that either all current workers in the tax unit decide to work or no one in the tax unit decides to work.[5]

We start by calculating the percent change in the return to work for each tax unit, which is (1) the change in the return to work due to the change to a child allowance divided by (2) the current return to work under the CTC.

Focusing first on (2), the return to work for the tax unit under the CTC is simply their current earnings minus their additional tax liability accrued due to working minus the SNAP benefits they lose due to working.[6] We calculate the additional tax liability accrued due to working as the

[4] Tax units currently working and not working would generally be affected by changes to the return to work. We apply the elasticities only to those who are working.

[5] Dual labor supply decisions by multiple workers in a single tax unit are more difficult to model. For the sake of simplicity, we only consider the cases in which either both or neither of the workers drop out of the labor force in response to the replacement of the CTC with a child allowance. In this way, we effectively treat the couple as a single worker responding to the change in work incentives facing the tax unit as a whole (and we count either zero workers or both workers as potentially exiting the labor force).

[6] We do not account for changes in housing assistance, TANF, SSI, DI, or OASI. While a tax unit's family may become eligible for these programs when the tax unit stops working, neither housing assistance nor TANF are entitlement programs (TANF moreover requires a work test for many recipients and the number of recipients is low), and SSI, DI, and OASI require the adult to be disabled and/or elderly, which is unlikely since the adult was previously working and has dependent children under age 18. However, families could potentially receive child SSI benefit when

additional federal income taxes, state income taxes, and payroll taxes (simulated via TAXSIM) paid as a result of going from zero earnings to current earnings. We calculate the amount of SNAP benefits lost due to working as the difference between the maximum SNAP benefits received by a tax unit's family (reflecting the amount under zero earnings) and the current level of SNAP benefits received (reflecting the amount under current earnings).[7,8]

Focusing next on (1), the change in the return to work due to the change to a child allowance is simply the change in the child allowance (between working and not working) minus the change in the CTC (between working and not working). For most workers, the child allowance is equal to the maximum amount whether or not they work, since the child allowance does not begin to phase out until $112,500 for tax units filling head of households and $150,000 for tax units filing married filing jointly. The CTC when not working is typically zero, except for tax units with sufficient unearned income to generate a positive federal tax liability even when not working. Thus, the decrease in the return to work for most workers is simply their CTC, though it can be higher for tax units with higher incomes.[9]

In order to calculate the percent change in the probability of working for each tax unit that is currently working, we multiply the percent change in the tax unit's return to work by the relevant elasticity for the tax unit. We apply an elasticity of 0.75 for tax units currently receiving the EITC and 0.25 for all other tax units. The 0.75 elasticity for tax units receiving the EITC is equal to the midpoint of the 0.3 to 1.2 range recommended for EITC-eligible workers based on a review of the literature in a CBO working paper (McClelland and Mok 2012), and falls within the 0.7 to 1.0 range provided in the Nichols and Rothstein (2016) literature review. The 0.25 elasticity is consistent with mainstream simulation models and the academic literature (Congressional Budget Office 2012; Chetty et al. 2013).[10] We consider a range of alternative elasticities in a series of

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they stop working though most of the families we simulate as stopping work would have had sufficiently low earnings to be eligible for SSI when working.

[7] We assume the tax unit's family receives the maximum SNAP benefit given its family size when the tax unit does not work. We calculate the current level of SNAP benefits as the maximum SNAP benefit (given family size) minus 24% of the tax unit's earnings, reflecting the 24% phaseout of SNAP benefits with earnings. We do not rely on survey reports of SNAP benefits for the case in which the tax unit works, because doing so could lead us to assign large changes in SNAP benefits for families that fail to report SNAP receipt, even if their earnings are too low to warrant such a large change. This would lead us to understate the return to work by overstating the amount by which SNAP benefits are reduced when switching from not working to working.

[8] If the family is ineligible for SNAP when the tax unit has zero earnings (due to unearned income of the tax unit or income from other tax units in the same family), we will understate the return to work by overstating the reduction in SNAP benefits.

[9] The change in TCJA CTC between not working and working will be zero for tax units with earnings below $2,500 because tax units require more than $2,500 in earnings to receive the TCJA CTC. The return to work will in rare cases increase for some tax units on the phase out portion (or beyond the phase-out portion) of the TCJA CTC who have substantial unearned income. For these tax units, the reduction in AGI from the loss of earnings could make them eligible to receive a higher amount of TCJA CTC. The TCJA CTC starts phasing out at $400,000 for tax units filling married filing jointly and at $200,000 for other tax units. For purposes of our labor supply calculations, we do not pro-rate CTC benefits based on dependents claimed by tax units who live outside the survey family. This implicitly assumes that workers incorporate the benefits accruing to claimed dependents outside of their family when deciding whether to work. Surveyed dependents claimed by adults outside of their survey family are not assigned as dependents to adults in their survey family.

[10] The Penn Wharton Budget Model assumes a baseline labor supply elasticity of 0.50 (combining participation and hours). CBO (2012) recommends a labor supply elasticity of between 0.22 and 0.32 for primary workers across all

robustness checks. We show results for every combination of the following elasticities: 0.30, 0.50, 0.75 and 1.20 for EITC recipients; and 0.05, 0.25 and 0.45 for non-EITC recipients.

In addition to the effects of a decreased return to work, the increase in income due to the change to a child allowance would be expected to reduce labor force participation as well. In order to estimate the reduction in participation in the labor force due to higher incomes, we apply elasticities that indicate the percent change in the probability of participation due to a one percent change in income. We follow NAS (2019) in assuming an elasticity of -0.085 for single mother tax units. We assign an elasticity of -0.05 for all other tax units.[11] We multiply these elasticities by the percent increase in income—the increase in income due to the change to a child allowance divided by income under the CTC, for the tax unit's family.

To estimate the total number of current workers exiting the labor force due to the replacement of the CTC with a child allowance, we multiply each individual worker's weight in the CPS ASEC by the percent change in the probability of working for each worker's tax unit, due either to the substitution effect or income effect.[12] We sum these products over all individuals in the CPS ASEC to obtain the number of workers exiting the labor force.

**Incorporating labor supply reductions into poverty simulations**

We next incorporate the labor force exits of tax units due to the change to a child allowance into our estimates of the poverty rate and child poverty rate under the child allowance.

For each family that includes a tax unit exiting the labor force with a nonzero probability, we create a new post-tax, post-transfer income value that reflects the exit from the labor force of the tax unit.[13] We make the following adjustments to post-tax, post-transfer income of the family. First, we subtract taxable earnings. Second, we replace current tax liabilities (reflecting current earnings) with re-calculated tax liabilities assuming zero earnings. This includes the child allowance, though for most tax units the child allowance given current earnings is equal to the child allowance given zero earnings.[14] Third, we replace the family's survey-based SNAP benefit with the minimum of

earnings deciles and secondary workers altogether. In a meta analysis, Chetty et al. (2013) conclude: "The estimates in table 1 should therefore be interpreted as a rough guide to plausible targets for calibration: they suggest that extensive margin elasticities around 0.25 are reasonable, while values above 1 are not."

[11] NAS (2019) assumes an employment elasticity with respect to income of -0.05 for men and -0.12 for married women. Because we conduct our analysis at the tax unit level, we take the lower -0.05 estimate to model joint decisions to exit the labor force.

[12] We identify a worker with dependent children as any adult aged 18 or over who (i) is the primary or secondary filer in a tax unit that includes at least one dependent under the age of 18 and has strictly positive earnings, and (ii) either reported working in 2016 or is the primary filer in a tax unit in which no adult reported working in 2016.

[13] If there are multiple tax units in the family that exit the labor force with nonzero probability, we only consider the labor force exit of the tax unit with the highest probability. This will lead us to understate poverty under the child allowance.

[14] The child allowance given current earnings will differ from the child allowance given zero earnings only when AGI given current earnings exceeds $112,500 for tax units filing head of household and $150,000 for tax units filing married filing jointly. For workers at these income levels in complex families who leave the labor force, we may overstate their child allowance given zero earnings because we do not pro-rate the credit for any claimed children who live outside the survey family.

(i) the family's survey-reported SNAP benefit plus 0.24 times taxable earnings, and (ii) the maximum SNAP benefit given the family's size.[15]

Given that every family is modeled as having a probability of exiting the labor force, we need to calculate income and poverty (allowing for behavioral responses) in a way that incorporates these probabilities. We start by creating two versions of each family in the CPS ASEC that reflect the two possible events (not exiting the labor force and exiting the labor force). For individuals in the version of the family that does not exit the labor force, we assign a new set of weights equal to the individual's CPS ASEC weight times the probability that the tax unit in the individual's family does not exit the labor force. For individuals in the version of the family that exits the labor force, we assign another set of weights equal to the individual's CPS ASEC weight times the probability that the tax unit in the individual's family exits the labor force.

Finally, we calculate the number of individuals represented by the first set of weights whose (unadjusted) equivalized post-tax, post-transfer income in the child allowance scenario falls below the poverty threshold. And we calculate the number of individuals represented by the second set of weights whose (adjusted) equivalized post-tax, post-transfer income in the child allowance scenario falls below the poverty threshold. The sum of individuals across both calculations is the number of people in poverty under the child allowance scenario allowing for behavioral responses.

[15] We simulate SNAP benefits in this way because SNAP benefits phase out at a 24% rate with earnings, and because underreporting of SNAP could lead us to overstate the increase in SNAP when not working if we simply assign the maximum SNAP benefit.

# Appendix F: Quantifying the effects of the change to a child allowance on implicit marginal tax rates

This appendix describes how we estimate the number of workers who face an increased implicit marginal tax rate (MTR) as a result of replacing the CTC with a child allowance, and the mean increase they face.

**Estimating changes in implicit marginal tax rates**

For workers with incomes below the point at which the difference between the child allowance and CTC begins to phase out, the increase in the implicit MTR on an additional dollar of earnings due to the change to a child allowance is equal to the phase-in rate of the CTC. This includes the phase-in of the ACTC, which phases in at $0.15 per dollar of earnings, and the phase-in of the non-refundable CTC, which phases in at the marginal federal income tax rate of the tax unit (generally 10% or 12% for tax units on the phase-in part of the TCJA CTC schedule).[16] To infer the phase-in rate of the CTC, we exploit the fact that a tax unit receiving a strictly positive but less than maximum amount of a particular credit will receive more of that credit if its earnings increase by an additional dollar.[17] The one exception is for tax units on the phase-out portion of the CTC, those with AGI of $400,000 or more for tax units married filing jointly and $200,000 or more for other tax units.

Specifically, the phase-in rate of the CTC—and thus the difference in implicit MTR between the CTC and child allowance—can be calculated based on four inputs corresponding to a given tax unit:

- The number of claimed dependents under the age of 17
- The amount of the existing ACTC
- The amount of the existing non-refundable CTC
- The marginal federal income tax rate (MFITR) of the tax unit (which is the same under the CTC and child allowance scenarios)

In the Table F-1 below, we show how these inputs can be used to determine the phase-in rates. We use the MFITR schedule for the 2018 tax year to maintain consistency with our tax simulations.

[16] Because the non-refundable CTC is applied after the other two major non-refundable credits for lower income families—the Credit for Other Dependents (ODC) and the Child and Dependent Care Tax Credit (CDCTC)—once the non-refundable CTC is eliminated the tax unit will not have these non-refundable credits to take its place.

[17] We will misstate the phase-in rate for the trivial share of tax units with earnings or income exactly $1 below the level needed to receive a particular credit.

**Table F-1. Phase-in Rate of TCJA CTC by Observed Amounts of ACTC and Non-Refundable CTC**

| ACTC | Non-refundable CTC | ACTC + non-refundable CTC | Phase-in rate of CTC |
|---|---|---|---|
| $0 | $0 | | 0% |
| $0 | ($0, # Dependents X $2,000) | | MFITR |
| ($0, # Dependents X $1,400) | $0 | | 15% |
| # Dependents X $1,400 | $0 | | 0% |
| ($0, # Dependents X $1,400) | ($0, # Dependents X $2,000) | ($0, # Dependents X $2,000) | 15% + MFITR |
| # Dependents X $1,400 | ($0, # Dependents X $2,000) | ($0, # Dependents X $2,000) | MFITR |
| | | # Dependents X $2,000 | 0% |

Note: Only dependents under age 17 are included in this table. Marginal federal income tax rate (MFITR) is the 2018 statutory marginal tax rate that applies to a tax unit with a given filing type and a given amount of taxable income. Tax units on the phase-out range of the CTC, with AGI of $400,000 or more for tax units filing jointly and $200,000 or more for other tax units, are excluded from this table.