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THE BENEFITS AND COSTS OF A U.S. CHILD ALLOWANCE

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ABSTRACT

We conduct a benefit-cost analysis of a U.S. child allowance, based on a systematic literature review of the highest quality available causal evidence on the short- and long-term effects of cash and near-cash transfers. In contrast to the previous studies we synthesize, which tend to measure a subset of benefits and costs available in a particular dataset, we establish a comprehensive accounting of potential effects and secure estimates of each. We produce core estimates of the benefits and costs per child and per adult of increasing household income by $1,000 in one year; these can be applied to value any cash or near-cash program that increases household income. Using microsimulation, we then apply these estimates to determine net aggregate benefits of three child allowance policies, including the expanded Child Tax Credit as enacted for the year 2021 in the American Rescue Plan (ARP). Our estimates indicate that making that expansion permanent would cost $97 billion per year and generate social benefits with net present value of $982 billion per year. Sensitivity analyses indicate that our estimates are robust to alternative assumptions and that all three child allowance policies we evaluate produce very high net returns for the U.S. population.

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A data appendix is available at http://www.nber.org/data-appendix/w29854

I. INTRODUCTION

As part of the federal income tax code, the Child Tax Credit currently provides a partially refundable tax credit of $2,000 per child. The credit reduces the tax burden by $2,000 per child for parents of most American children. About a third of American children, however, live in families whose incomes are too low to receive the full $2,000 per child, and about 1 in 10 children get no benefit whatsoever. If the tax credit were fully refundable, it would be akin economically to a $2,000 child allowance (the international and historical context of child allowances, and the CTC, are presented in appendix 2). A proposal to do just that was the centerpiece of two of the four policy packages examined by the National Academy of Science consensus report, *A Roadmap to Reducing Child Poverty* (2019; henceforth "NAS report").[1] While the NAS report points to recent causal research suggestive of positive returns for society from investing in a child allowance, it does not include a systematic accounting. Building upon the findings of the NAS report, this paper uses a comprehensive benefit-cost analysis to determine the aggregate benefits and costs of establishing a child allowance in the United States.

Our analysis is based on a systematic review of studies documenting the effects of cash and near-cash income transfer programs on child and parent outcomes. The studies examined are primarily quasi-experimental and examine effects of cash and near-cash transfers—most commonly Food Stamps and the Earned Income Tax Credit, as the rollouts and structures of these two programs allow causal analysis of their impacts. For child beneficiaries, impacts include future earnings and taxes paid, educational attainment, and four health outcomes: birth weight, neonatal

[1] More recent proposals, including the American Family Act and the recently enacted one-year child allowance in the American Rescue Plan, contain more generous allowances: $3,600 for children ages 0 to 5 and $3,000 for children ages 6-17 (we refer to this as the $3,600-$3,000 child allowance). Senator Romney's Family Security Act proposes even more generous allowances: $4,200 for children ages 0-5 and $3,000 for children ages 6-17, but was financed through cuts of other social programs.

mortality, health between age one month and death, and longevity. For parent beneficiaries, impacts include health, mental health, and longevity. We also estimate the declines in expenditures on health, other transfer programs, child protective services, and the criminal justice system, and increases in expenditures due to increased educational attainment and increased longevity. We summarize the methodology, data, and findings of each study employed in our analysis and standardize the findings in each to reflect the effects of a $1,000 increase in household income per year on the impacts of interest. We then monetize the value of each benefit and cost, using standard values for health and life, administrative data on costs, and a 3% interest rate to discount the value of future benefits and costs. For each benefit and cost, we estimate the value to society as a whole including, separately, the direct benefits and costs for program beneficiaries along with the indirect benefits and costs to taxpayers. The transfer costs and their distributional impacts are estimated via a micro-simulation analysis of CPS data that incorporates changes in labor supply.

The paper is organized as follows. Section II describes the methodology used in our benefit-cost analysis, highlighting its conceptual underpinnings, the central role of literature reviews in benefit-cost analysis, and the assumptions and rules that underlie our analyses. Section III presents our core-building-block results on the dollar magnitude of each benefit and cost that results from an increase in family income of $1,000. Section IV converts the estimated benefits and costs per $1,000 increase in household income into estimates of aggregate benefits and costs. Section V conducts sensitivity analyses. Section VI contextualizes our findings within canonical literature and section VII summarizes our main findings and discusses limitations and future research.

II. CONCEPTUAL FRAMEWORK AND APPROACH

II.A. Potential Benefits and Costs

Table 1 describes the potential monetary benefits and costs of a child allowance. *Direct benefits and costs* are those that accrue to the children and their parents from the child allowance that the family receives. *Indirect benefits and costs* accrue to everyone in the society, the bulk via changes in taxes and the rest via reductions including in the victim costs of crime and in health insurance premiums. For ease of exposition, we refer to indirect benefits and costs that accrue to people other than those directly receiving the payment as benefits and costs to taxpayers; note, however, that most direct beneficiaries are also taxpayers (in the case of children's parents) or will eventually be so (in the case of children). Each row in the table provides a conceptual description of a potential benefit (indicated with a +) or cost (-).

Row A in the table indicates that the cost to taxpayers of the child allowance transfer is exactly offset by the benefit of the child allowance transfer to beneficiaries: cash benefits of one dollar are worth a dollar to beneficiaries and the cost to taxpayers equals one dollar. The direct costs of a cash transfer to society as a whole are zero. This is not to say that transfers are costless to society: rows L, M, and O, discussed below, describe the additional costs of transfers to beneficiaries, taxpayers, and society.

Row B in the table indicates that child allowances are expected to lead to increases in the earnings of child beneficiaries when they become working-aged adults. The expectation is derived both from the assumption that income enhances child development and, more importantly, from ample empirical evidence of positive effects of transfers in childhood on earnings and other outcomes associated with increased earnings (reviewed below). The increased earnings are of direct benefit only to child allowance beneficiaries. Taxpayers get nothing directly from beneficiaries' earnings—hence the zero in the taxpayers' column. Row C indicates that increases in beneficiaries' earnings lead to higher tax payments, which are a cost to beneficiaries and an indirect benefit to taxpayers—either in the form of more public goods or lower taxes for them. The zero in the last column indicates that the loss for beneficiaries in terms of increased taxes paid is exactly equal to the gain to taxpayers.

Rows D and E reflect health and longevity benefits to child and parent beneficiaries and to society as a whole. Rows F thru I reflect reductions in public expenditures on health care, criminal justice, foster care, and other cash and in-kind assistance programs that are expected to follow from increased future earnings and better health described in rows B, D, and E. These reductions in public expenditures accrue primarily to taxpayers via reductions in taxes. Most do not accrue to beneficiaries. But note that in the case of reductions in health expenditures in row F, the benefit to taxpayers comes partially from reductions in taxes and partially from reductions in private health insurance costs.[2] Beneficiaries also benefit because their out-of-pocket health expenditures will decline as a consequence of their better health. More important, row G shows that the transfer leads not only to reductions in criminal justice expenditures but also to reductions in victimization costs--how much victims are willing to pay to avoid the crime.

Also note that row I (avoided expenditures on other cash or near-cash transfers) entails a cost to beneficiaries that is exactly equal to the savings for taxpayers, unlike rows G-H, which reflect reductions in expenditures on services including crime and foster care. While loss of cash has an intrinsic cost to beneficiaries, a change that renders a service unnecessary does not. If the service is not needed, the beneficiary has lost nothing by not receiving it.

[2] Health insurance premiums, even for private insurance, are functions of average rather than individual health and therefore accrue to the collective rather than the individual whose health has changed; changes in out-of-pocket health expenditures, by contrast, accrue directly to the individual beneficiary.

The increased longevity in rows D and E, while obviously of value to beneficiaries, is not without a cost. As shown in row J, due to increased longevity, taxpayers need to finance more health care and Social Security payments. Also, based on evidence that children acquire more education due to cash transfers, we take into account the increased expenditures associated with more schooling in row K.[3]

Rows L (administrative costs), M (excess burden for beneficiaries), and O (excess burden for taxpayers) describe the costs of transfers. These costs are what Arthur Okun, in his classic 1975 book *Equality and Efficiency: The Big Tradeoff*, referred to as leaks in the transfer bucket. Administrative costs of transfers (row L) are of no benefit to beneficiaries but must be paid for by taxpayers. The excess burden for beneficiaries (row M) arises from a distortion in prices faced by beneficiaries. Child allowances subsidize the costs of having children, giving rise to an excess burden that is borne by beneficiaries relative to a grant of the same amount not tied to the beneficiary's number of children. The excess burden of taxation (row O) refers to the social welfare loss that comes from the distortion in prices from taxation. Income taxes, for example, distort the incentive to earn more income and reduce the incentive to report income. These distortion costs are borne by taxpayers. Row N describes the reduction in tax payments from parent beneficiaries due to decreases in employment, hours worked, and earnings. This reduction in taxes is a benefit to beneficiaries but a cost to taxpayers. The non-monetizable benefits and costs are important, but because of space constraints are discussed in appendix 3.

II.B. Empirical Methodology

Having laid out the conceptual costs and benefits of a child allowance, we now turn to estimating the size of each, and describe our methodology in arriving at these estimates.

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[3] We also expect a reduction in special education expenditures but were not able to find a good causal estimate of this benefit. Consequently, taxpayers' savings are understated.

II.B.1. Similarity of Impacts of All Cash and Near-cash Benefits

A sound benefit-cost analysis will cast a wide net in seeking scientific evidence on the impacts of the program being evaluated because failing to value a potential benefit is equivalent to treating the benefit as being equal to zero. Fortunately, while there is no scientific literature focused directly on the magnitudes of the effects of child allowances on the monetary benefits identified above in table 1, there is an emerging rich literature on the magnitudes of effects of other cash and near-cash programs.

In order to ensure we have compiled a comprehensive literature on the benefits and costs of cash and near cash programs, we followed a meta-analysis type approach in gathering evidence. We used a three-stage screening process to identify relevant studies for each benefit and cost. While the first two stages cast a wide net, the last stage of the screening process limited studies of impacts to quasi-experimental and experimental studies. Our literature search and winnowing process is described in appendix 1.

A key assumption underlying our analysis is that the effects of cash and near-cash assistance on children and parents are expected to be similar to one another and to a child allowance because they all provide similar monetary benefits to parents with children. Because all of these programs increase family income, all are expected to increase parents' and children's well-being in the short- and long-term. We do not adjust for possible differences between programs' effects in our calculations because we believe such differences are secondary; nonetheless, it is worth briefly noting several differences at the outset. One obvious difference is that food stamps are not cash, but they are what researchers consider "near-cash". Food stamps, on average, are worth about 80 cents per dollar (Whitmore, 2002), suggesting that the same dollar amount given in the form of cash child allowances would lead to 25% larger benefits among child allowance recipients. Another difference is that while mothers' pensions and food stamps provide transfers to those with no earnings, as do child allowances, those transfers phase out at relatively low income levels, which is not the case with a child allowance; transfer phase-outs from these programs may discourage earnings in ways that a child allowance would not. The EITC, in contrast, provides cash only to those who work, and the size of the payment increases with earnings at low levels. However, the vast majority of EITC beneficiaries have sufficient earnings such that further increases in earnings actually reduce their EITC (Eissa & Hoynes, 2006), so the effects of the EITC for them should be similar to the effects of food stamps or mothers' pensions; that is, as recipients' earnings rise, their EITC payment falls.[4] While our perspective is that these programs provide a good prediction of the effects of a child allowance, ultimately, the reader will have to judge whether they think the evidence warrants the assumption of similar effects between cash and near-cash programs (note that these differences suggest that a child allowance would, if anything, have larger benefits than the comparison programs on which we build our estimates). That judgment can be informed by the empirical evidence described below.

[4] The effects of the EITC on both the parents and children for the small group of parents who work in response to the EITC but would be at home caring for their children in the absence of the EITC are ambiguous. While family income will be higher because of this shift to more work, the child will have less time with the parent who is working. The net effect on the child's future earnings will be positive if the substitute care for the child is as good or better than parent care. If the substitute care is worse, the effect on future child earnings is ambiguous. Most research suggests that parent care in the first year of life is superior to substitute care, providing the rationale for paid parental leave. This suggests a child allowance, which can be neutral with respect to parent employment, might lead to higher future child earnings than an EITC for children in the first year of life. For older children, there is no evidence of superiority of parental care, so the EITC may lead to larger future children's earnings than a comparable child allowance benefit among any families for whom labor force participation is affected. In short, the EITC could have different effects for this minority of parents. But the net direction of these differential effects is not clear, and a full comparison of the costs and benefits of an EITC versus a child allowance is beyond the scope of this paper.

III. MEASURING IMPACTS: STUDY DATA, METHODS, FINDINGS AND STANDARDIZATION

We found 21 studies that examine the impacts of a change in income on our outcomes of interest and met our stringent criteria. We begin this section with an overview of the impact estimates from the 21 studies. In the following part of this section, we describe how we calculated the monetary value of each benefit and cost in table 1.

III.A. Impact Estimates from 21 Studies

Table 2 summarizes the impact estimates from the studies reviewed. The studies are divided between those used for the calculation of benefits and those we call supplementary impact studies. The studies examining the causal impacts of cash or near-cash transfers on birthweight, educational attainment, and mental health are labeled as supplementary, because adding them to the value of other benefits would involve double-counting benefits given that we value outcomes downstream of these. For example, cash or near-cash transfers lead to higher birthweight, which leads to the following outcomes that we account for separately: lower neo-natal mortality, better long-term health, and higher earnings. Documenting these intermediate causal impacts, however, helps clarify ways that increased income affects the ultimate outcomes in table 1. With one exception, all the studies find beneficial impacts. Most find statistically significant impacts. With the exceptions of neonatal mortality, crime reduction, and involvement with child protective services, there are at least two studies for each impact. Together the impact estimates present a strong coherent set of positive long-term impacts on children and parent recipients.

III.B. Children’s Future Earnings

We leverage five studies to estimate the impact of a child allowance on children’s future earnings in adulthood. The first four studies examine the impacts of actual cash and near-cash programs—

mothers' pensions, the EITC, and food stamps—while the last, by Price and Song (2018), is a long-term follow-up to a Negative Income Tax (NIT) experiment. With the exception of Price and Song (2018), the literature is consistent in finding long-term positive effects of cash or near-cash assistance on the future earnings of children. In particular, the four studies of the actual government programs show positive impacts. The present discounted value of future earnings is between $418 and $4,186 in those four, while Price and Song (2018) finds a decrease in earnings of $555. We use the mean value as our baseline estimate whenever there are multiple estimates of a single outcome and conclude that children's future earnings would increase by $1,444 as a result of $1,000 increase in household income from cash and near-cash transfers in childhood. Unlike all the other benefits described below, increased future earnings are denominated in dollars. Thus, the impact on future earnings near-completely describes their value.[5]

III.B.1. Aizer et al. (2016)

Aizer et al. (2016) found that in adulthood, sons whose mothers had received Mothers' Pensions between 1911 and 1935 experienced an increase in annual income of $90.93 (s.e. 35.976), a 14% increase. As discussed in sections on children's longevity (A4.I.d.1) and children's educational attainment (A4.VI.e), the authors also found an increase in longevity of 0.0158 (s.e. 0.007) or 1.16 years and an increase in educational attainment of 0.316 (s.e. 0.262) years. The authors matched administrative records, census records, and death records from 11 states to examine the long-term outcomes of male children who were raised in households who applied for the Mothers' Pensions between 1911 and 1935 (n=1,960). The authors compared the outcomes of children of accepted

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[5] If the increase in earnings is due entirely to an increase in wage rates, a one dollar increase in earnings is valued at exactly one dollar. If the increase is due to an increase in hours worked, an increase of one dollar in earnings is worth somewhat less than a dollar because of the extra time working. Unfortunately, research to date cannot distinguish between impacts on future wage rates and impacts on future hours worked. We tentatively assume the entire gain is from an increase in the hourly wage rate.

and rejected applicants using linear regressions. Rejected applicants were deemed to be an appropriate comparison group because like the accepted mothers, the rejected mothers were also economically constrained and sought aid, but they were somewhat better off (which is why they were rejected); thus, in the absence of aid, their sons would have been expected to do somewhat better than the accepted sons, which implies that these estimates may somewhat understate the impact.

According to Aizer et al. (2016), Mothers' Pensions were $3,684 (2019$) annually and received for three years on average. A $1,000 transfer for one year would thus increase children's future earnings by 1.27% (0.14*((1000/3684)/3)). We believe that the level of future earning of children whose mothers received Mothers' Pensions during Aizer et al's study period approximates the 25th percentile income in 2019. According to the Current Population Survey, in 2019, annual earnings were on average $10,000 at the 25th percentile of the working-aged[6] earnings distribution (authors' calculations). Multiplying $10,000 by 1.27% yields an annual increase in earnings of $127. We calculate the present discounted value using equation 1 below. We assume a discount rate of i=0.03. According to our calculation above, the early benefit B=$127. The average child beneficiary is assumed to be age 9. We use this assumption in the calculation of all child benefits. Increased earnings are assumed to begin at age 22 (a=22) and end at age 64 (A=64). We use this assumption for all estimates on children's future earnings. We conclude that the present discounted value of increased earnings in adulthood is $2,131 as a result of a $1,000 cash transfer during childhood.

$$\text{(1)} \qquad \text{PDV} = \sum_{t=a}^{A} \frac{B}{(1+i)^{t-9}} = B\left(\frac{(1+i)^{9-(a-1)} - (1+i)^{9-A}}{i}\right)$$

[6] By working-aged, we refer to ages 25 to 64.

III.B.2. Hoynes, Schanzenbach, and Almond (2016)

Hoynes, Schanzenbach, and Almond (2016) examine the long-term health and economic impact of exposure to food stamps between conception and age 5 using the Panel Study of Income Dynamics (PSID). They found that among individuals whose parents were without a high school diploma, exposure to food stamps from conception to age 5 increased earnings by $3,610 (s.e. 5,064). $3,610 (measured in 1995 dollars) is the equivalent of $6,063 in 2019 dollars[7]. As discussed in the section on children's health (A4.I.c.2), they also found that among the full sample, exposure to food stamps from conception to age 5 decreased the probability of having metabolic syndrome by 0.438 (s.e. 0.204) standard deviations and increased the probability of reporting good health by 0.292 (s.e. 0.133) or 30 percentage points. The authors conducted difference-in-differences analyses taking advantage of variation in the introduction of the Food Stamp Program by county. The intent-to-treat group includes individuals whose parents were without a high school diploma and who did not receive food stamps as well as those whose parents were without a high school diploma but did receive food stamps. Models controlled for county, year of birth fixed-effects, year of interview, whether child was born to a female-headed household, education of head of household, family income, the child's gender, child's marital status, child's race, quadratic in age of child, state linear time trends, and 1960 county characteristics.

Hoynes, Schanzenbach, and Almond (2016) estimate that among families where heads had less than a high school degree, 43 percent participated in food stamps. Thus, in order to adjust results to reflect the impact on treated individuals we divide their results by 0.43, resulting in an estimate of $14,100 ($6063/0.43). Since individuals in the sample were exposed to food stamps

[7] The paper starts measuring economic outcomes such as earnings in adulthood when individuals reach age 25. Since the sample includes individuals born between 1956-1981, this means that earnings in adulthood is first measured in 1981. The last wave of PSID data used by the paper is 2009. Thus, we assume that $3610 is measured in 1995 dollars (the middle of the period 1981-2009).

for 7 years (from conception (age -1) to age 5), the estimate decreases to $2,014. Average annual food stamps values per person in 1972 (near the midpoint of the study period) were $994 per year in 2019 dollars (Department of Agriculture, 2021). Assuming average households have three individuals, the total household food stamps value would be $2,982 on average. Thus, the impact decreases to $675 ($2014*(1000/2982). As the paper studies the impact of exposure from conception (age -1) to age 5, we (conservatively) assume that individuals were exposed to food stamps through the entirety of childhood (from age -1 to age 17) but only derived benefits for future earnings during the first 7 years of payments. To measure the impact per year of payments, we multiply results by the 7/19 of years in which they derive benefits, yielding an estimate of $249. Using equation 1, we conclude that the present discounted value of increased earnings in adulthood is $4,186 as a result of a $1,000 cash transfer during childhood.

III.B.3. Bailey et al. (2020)

Bailey et al. (2020) found that exposure to food stamps from conception to age 5 increased future earnings by 0.0114 (s.e. 0.0034) or 1.14 percent. The authors find no additional effects for exposure at ages 6-18. As discussed in section A4.I.c.3 on children's health, section A4.I.d.2 on children's longevity, and section A4.VIII.b. on crime reduction, they also discovered that as a result of exposure to food stamps, children's physical ability and health increased by 0.0013 standard deviations (s.e. 0.0013), children's longevity increased by 0.176 years (s.e. 0.030), children's future earnings increased by 1.14 percent (s.e. 0.34 percent), adult economic self-sufficiency increased by 0.0043 standard deviations (s.e. 0.0016), and the probability of being incarcerated decreased by 0.0008 (s.e. 0.0004) or 0.08 percentage points. Based on data from the 2001-2013 American Community Survey matched with the 2000 Census Long Form (n=7,705,000), the authors use a difference-in-difference framework exploiting the county-by-county introduction of food stamps. Models control for county of birth, birth year, and birth state fixed effects as well as 1960 county-level characteristics interacted with a linear birth-cohort trend.

Since children in the sample were exposed to food stamps for 7 years (conception to age 5), we divide 1.14 percent by 7, arriving at 0.16 percent. Average annual food stamps values per person in 1972 (near the midpoint of the study period) were $994 per year in 2019 dollars (Department of Agriculture, 2021). Assuming average households have three individuals, the total household food stamps value would be $2,982 on average. Thus a $1,000 cash transfer would increase earnings by 0.055 percent (0.0016*(1000/2982)). Then, we convert the intent-to-treat estimate to an estimate of the treatment effect on the treated. Using the Panel Study of Income Dynamics, the authors estimate that 16 percent of children participated in food stamps between 1975 and 1977. Thus, we divide 0.055 percent by 0.16, yielding 0.34 percent**.** The authors report that the natural log of the average labor income of the full samples is 10.57, which equals $38,948.67. Income data spans from year 2000-2013 so the midpoint is year 2006. $38,948.67 in 2006 dollars equals to $49,169 in 2019 dollars. Thus, the estimate becomes $168 (0.0034*49169) increase in income per year. As the paper studies the impact of exposure from conception (age -1) to age 5, we (conservatively) assume that child recipients were exposed to food stamps through the entirety of childhood (from age -1 to age 17) but only derived benefits for future earnings during the first 7 years of payments. We multiply results by the 7/19 of years in which they derive benefits, decreasing the impact to $62. Using equation 1, we conclude that the present discounted value of increased earnings in adulthood is $1,040.

III.B.4. Bastian and Michelmore (2018)

Bastian and Michelmore (2018) found that an additional $1,097 in EITC (2019 dollars) exposure during childhood was associated with an increase in earnings of $646.1 (s.e. 818.3) among children exposed between ages 0 and 5, an increase in earnings of $42.4 (s.e. 415.1) among children exposed between ages 6 and 12, and an increase in earnings of $564.0 (s.e. 244.9), among children exposed between ages 13 and 18. As discussed in the section on children's educational attainment (section A4.VI.f), the exposure was also associated with a 0.012 (s.e. 0.003) or 1.2 percentage-point higher probability of completing high school, a 0.013 (s.e. 0.005) or 1.3 percentage-point higher probability of completing college and a 0.008 (s.e. 0.004) or 0.8 percentage-point higher chance of being employed in young adulthood among children exposed between ages 13-18. The 1968-2013 waves of the Panel Study of Income Dynamics (PSID) were used to examine the impact of exposure to the federal and state EITC between 1967 and 1995 (n=3,495). The authors measured EITC exposure using the maximum potential federal and state credit a household could receive based on the year, state, and number of children in the household. F-statistics using this maximum credit to predict increased family income were well above the critical value for weak instruments.

To simplify our calculations, we first determined an average impact across all ages by multiplying each of Bastian and Michelmore's estimates for the three age groups times the proportion of children in that age group. According to Bastian and Michelmore (2018), children exposed to EITC from ages 0-5, from ages 6-12 and from ages 13-18 make up 21.6%, 40.4% and 38% of their samples, respectively. Thus, the weighted average impact is $371 ([646.1*0.216]+[42.4*0.404]+ [564.0*0.38]). Bastian and Michelmore (2018) measure earnings in 2013 dollars. $371 in 2013 dollars is $407 in 2019 dollars. We find that $1,000 of EITC, in 2019 dollars, increased children's earnings in adulthood by $371 (407*(1000/1097)). However, these results are for multiple years of exposure to the EITC and include all children in states in which the maximum EITC increased, not just recipient children. We assume the child was exposed to the EITC from age 0-17 (a total of 18 years), yielding a $21 ($371/18) increase in earnings per year of exposure. To convert this intent-to-treat estimate to an estimate of the effects on the treated, we divide $21 by the percentage of EITC-eligible households that received the EITC in 1990 (the middle of the study period), which was 83% (Scholz 1994) [8], resulting in a $25 increase in earnings for a $1000 transfer. Using equation 1, we conclude that the present discounted value of increased earnings in adulthood is $418, as a result of a $1,000 cash transfer during childhood.

III.B.5. Price and Song (2018)

Price and Song (2018) found that an additional $2,962 (2019 dollars) in cash transfers annually for three to five years decreased children's future earnings by $356 (s.e. 601). As elaborated in section A4.I.c.4 on children's health, section A4.III.a.4 on parent's health and section A4.III.b.1 on parent longevity, in consequence of the transfer, the probability of children applying for disability benefits (either means-tested and non-means-tested) in adulthood increased by 0.537 percentage points (s.e. 1.25), disability benefits application rate increased among parents by 0.063 (s.e. 0.0199) or 6.3 percentage points, and the likelihood of death rose among parents by 0.0138 (s.e. 0.0196) or 1.38 percentage points. They used long-term outcomes of the Seattle-Denver Income Maintenance Experiment (SIME/DIME) to examine the impact on families (n=52,867) who were randomized to receive $2,962 (2019 dollars) more in transfers annually than the control group for either three or five years, depending on treatment group. Long-term outcomes were measured by matching experimental data with data from the Social Security Administration and Washington State Department of Health.

$356 is measured in 2013 dollars and in 2019 dollars it would be $391. Adjusting for years of exposure, we divide -$391 by 4 (the unweighted average of 3 and 5) and derive -$98. Finally, to estimate the impact of a 1,000 transfer, we multiply -$98 by (1000/2962). The final estimate is

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[8] Scholz (1994) estimated an EITC participation rate of 80.5-86.4 percent. We use the average of this range of values, which is approximately 83%.

a $33 decrease in earnings per year. Using equation 1, we conclude that the present discounted value of decreased earnings in adulthood is $555 per $1,000 cash transfer during childhood.

III.C. Children's Future Taxes

Children's increased earnings will lead to increases in the taxes that they pay. We use the most recent estimate, to our knowledge, of total taxes paid as a percentage of income to convert the estimate of increased earnings to increased taxes (Wamhoff & Gardner, 2019). We find that among the lowest 40% of households by income, 21% of the increase in earnings would be paid in federal, state, and local taxes (personal and corporate income, payroll, property, sales, excise, and estate taxes). Multiplying our average estimated increase in children's earnings ($1,444) by 21% yields an estimate of the present discounted value of increased taxes of $303. By assuming none of the increased average income causes beneficiaries to end up in higher tax brackets (in which case they would pay more taxes), this is a conservative estimate of the effect on taxes.

III.D. Children's Health

We begin this section with a discussion of the monetary value of health and life. We then present the summaries of studies and the standardized calculations for the health benefits to child beneficiaries flowing from reduced neonatal mortality, improved health from one month of age onward, and increased longevity. Starting from this section, studies and calculations will only be briefly summarized. Detailed descriptions of studies and the standardized calculations on health and other outcomes are presented in appendix 4.

III.D.1. Monetizing the Value of Life and Health

We use two measures to place a monetary value on life and on improvements in health: value of statistical life (VSL) and quality-adjusted life-years (QALY). The former is used to value changes in neonatal mortality and the latter for changes in health and longevity.

The VSL estimates the amount individuals are willing to pay to reduce the risk of death. The U.S. government uses slightly different VSL estimates among various departments, ranging from $9.6 million (Environmental Protection Agency, 2010) to $10.4 million (U.S. Department of Transportation, 2016) in 2019 dollars. We use the midpoint of this range for our calculations, $10 million.

The QALY estimates the amount individuals are willing to pay to increase their health and longevity. A QALY estimate for a given year ranges from one to zero, where one represents one year of perfect health and zero represents death. The World Health Organization (WHO) recommends valuing a QALY between one and three times the gross domestic product per capita (Marseille et. al., 2015). In 2019, the GDP per capita in the U.S. was $65,056 (Bureau of Economic Analysis). Thus, according to WHO, a QALY should be valued between $65,056 and $195,168 in 2019. These monetary values can be compared to the $10 million estimate used for the VSL. If a life is valued at $10 million and average life expectancy is 78 years, the per year value of life would be approximately $128,000. The latter estimate is very close to the midpoint within the range the WHO recommends using to value QALY. Therefore, to maximize consistency between the values of VSL and QALY, we value one year of perfect health at $128,000.

III.D.2. Child Neonatal Mortality

Our literature search yielded one quasi-experimental study examining the relationship between cash or near-cash transfers and neonatal mortality (death in first 28 days), by Almond, Hoynes, and Schanzenbach (2011). Based on their estimates, we conclude that an annual $1,000 transfer during childhood decreases neonatal mortality by $10.

III.D.3. Children's Health from One Month of Age Onward

This section describes literature on the impact of cash and near-cash transfers on children's health from one month of age onward. One of the studies examines the impact of cash or near-cash transfers on children's health in childhood (Averett & Wang, 2018) and three examine their impact on children's health in adulthood (Bailey et al., 2020; Hoynes, Schanzenbach, and Almond, 2016; Price & Song, 2018). Based on these papers, we conclude that a $1,000 increase in household income from cash or near-cash transfer during childhood improves health in childhood by 0.02 percent of QALY per year and improves health in adulthood by, -0.008 percent, 0.002 percent and 0.12 percent of QALY per year. We calculate the present discounted value of the change in children's health in a single year by assuming the average age of child beneficiaries to be 9 and the average age at death to be 78. To calculate the present discounted value of the health impact in childhood, we assume that a given transfer impacts health beginning at age 9 and continues until age 21. To calculate the present discounted value of the health impact in adulthood, we assume that a given transfer impacts health from age 22 to age 78 (to match our assumption for children's future earnings, we assume impact on adulthood begins at age 22). We conclude that the present discounted value of health impact in childhood is $338. and the present discounted value of health impact in adulthood is $900 (individual values are -$184, $58 and $2,827 for individual papers).

III.D.4. Children's Longevity

We use two studies to examine the impact of a cash or near-cash transfer on child longevity (Aizer et al., 2016; Bailey et al., 2020). Based on the results (see appendix 4 for details), we conclude that a $1,000 increase in household income from a cash transfer during childhood increases longevity by between 0.02 and 0.105 years. The present discounted value of increased longevity in adulthood is $1,036 on average (individual values are $323 and $1,748) as a result of a $1,000 transfer during childhood.

III.E. Avoided Health Expenditures for Children

This section estimates the impact of a $1,000 cash transfer on health expenditures for children. To our knowledge, no study examines this relationship directly, so we develop two indirect estimates. In section III.E.1, we discuss how our estimates on birthweight are used to estimate reductions in health expenditures in the first six months of life and obtain a present discounted value of $8. In section III.E.2, we discuss how our estimates on children's health in childhood and adulthood are used to estimate healthcare expenditure reductions from six months of age onward. Counting avoided expenditures in the first six months of life ($8) and in subsequent childhood ($12) and adulthood ($56), we conclude that health expenditures decrease by $76 per $1,000 transfer.

III.E.1. Decline in Healthcare Expenditures in First Six Months of Life

As discussed in section A4.I.a.2 of appendix 4, our estimate from Almond, Hoynes, and Schanzenbach (2011) indicates that a $1,000 cash transfer decreases the probability of low birthweight by 1.19 percent. In order to estimate how this changes healthcare expenditures, we use research by Beam et al. (2020), who examine the difference in healthcare expenditures among average birthweight and low-birthweight infants.

III.E.2. Decline in Healthcare Expenditures from 6 Months of Age Onwards

As described above, we estimate the percentage change in health during childhood and adulthood respectively to be 0.02% and -0.008%, 0.002%, or 0.12%. As described in detail in appendix 4, we rely on the results of three studies to determine the rate at which healthcare expenditures decrease in relation to increases in health status. Although the studies are not causal, no quasi-experimental study exists, to our knowledge, examining this relationship. The mean estimate of the elasticity of healthcare expenditures to improvements in health is -0.84 (minimum elasticity is

-0.19 and maximum elasticity is -1.48). Through calculations in appendix 4, we conclude that health care savings equal $12 in childhood and $56 in adulthood.

III.F. Increases in Parent Health

Seven papers on parent health (including overall health and longevity) met our requirements for rigor and relevance. Summaries of each paper and the calculations of health impacts are included in appendix 4. We do not assign separate benefit values for the mental health outcomes in these papers as that would involve double counting.

III.F.1. Overall Parent Health

We use four studies to examine the impact of cash or near-cash transfers on parent health (Evans & Garthwaite, 2014; Larrimore, 2008; Morgan et al., 2020; Price & Song, 2018). With the exception of Price and Song (2018), which examines the impact of an NIT experiment, these papers examine the impact of the federal EITC and state EITCs on parent health. To calculate the present discounted value, we include the non-discounted benefit of the year of the transfer when the parent is 38, using the assumption that a parent is 29 at their child's birth (based on the mean age of mothers at birth in 2019 according to CDC Vital Statistics) and that an average child beneficiary is nine years old. We assume that the benefits extend throughout the remainder of the parent's life course until age 78. We find that a $1,000 increase in household income from a cash transfer improves parent health by between -0.11 percent and 0.11 percent of QALY per year. Individual values for yearly benefit are -$136, $39, $53, and $144. The present discounted value of improved health is $598 on average (individual values are -$3,283, $930, $1,282, and $3,464).

III.F.2. Longevity or Mortality

Our extensive literature search yielded one experimental study and one quasi-experimental study examining the relationship between cash transfers and adult longevity: Price and Song (2018) and

Aizer, Eli, and LIeras-Muney (2020). To be conservative, we use a very well-done paper that describes the longitudinal relationship between income and adult longevity, Chetty et al. (2016), to cap the expected magnitude for estimates on parent's longevity. Although the estimated relationship in Chetty et al (2016) was not causal, we use it as an upper bound because we believe omitted variable bias and reverse causation are likely to lead to upward bias in the estimated effect. Results from Price and Song (2018) and Aizer, Eli, and LIeras-Muney (2020) imply that the present discounted value of increased longevity is $416 on average (individual values are -$46 and $877) as a result of a $1,000 transfer. Results from Chetty et al. (2016) imply that the present discounted value of increased longevity is $234. Since the average of estimates from Price and Song (2018) and Aizer, Eli, and LIeras-Muney (2020) exceed that of Chetty et al. (2016), we use the estimate from Chetty et al. as our final estimate on parent longevity. **III.G. Avoided Health Expenditures for Parents**

To calculate the reduction in health expenditures for parents, we rely on the same methodology and assumptions we used to calculate reductions in health expenditures for children. Based on our findings on healthcare expenditure elasticity, we assume that for one percent increase in physical health, health expenditures decrease by 0.84 percent. To calculate the present discounted value, we include the non-discounted benefit of the year of the transfer when the parent is 38 and the discounted benefits from ages 39 to 78. Results imply that the present discounted value of decreased healthcare expenditures for parents is on average $48 (individual values are $-266, $75, $104 and $281) as a result of a $1,000 cash transfer. Detailed description of the calculations is provided in appendix 4.

III.H. Child Welfare

Our literature search yielded one quasi-experimental study examining the relationship between cash transfers and child welfare, Berger et al. (2017). The authors examine the impact of EITC benefits on the probability of being investigated by Child Protective Services, as described in details in appendix 4. Results imply that the present discounted value of lowered child welfare spending is $21 as a result of a $1,000 cash transfer.

III.I. Other Transfers

We estimate decreases in other transfers by combining quasi-experimental estimates of increased future earnings with the association in current nationally representative data between parents' earnings and other transfers. Though some studies have attempted to independently estimate causal effects of cash programs on future transfers, the estimates from these studies are less reliable than estimates of increased earnings because receiving transfers is less common than having earnings and more likely to be measured differently in different studies. We find that a $1,000 increase in earnings is associated with a $20 decrease in the present discounted value of transfers on average (individual values are -$8, $6, $14, $29, and $57).

III.J. Decreases in Crime

We use one study to examine the impact of cash or near-cash transfers on crime reduction (Bailey et al., 2020). We follow Heckman et al. (2010) to derive the dollar value of the benefit of crime reduction. Detailed summaries of Heckman et al. (2010) and Bailey et al. (2020) are in appendix 4. Note that 77% of crime reduction in Heckman et al. (2010) is attributable to reduction in costs to crime victims. We conclude that the present discounted value of decreased crime per $1,000 increase in household income per year from a cash transfer is $1,117.

III.K. Increased Payments Due to Increases in Children's and Parent's Longevity

With the increased children's and parent's longevity comes a cost. Two major components of the cost are Social Security and Medicare. We use our estimates of children's and parent's longevity along with annual Social Security and Medicare payments according to the Social Security Administration (2019) and Kaiser Family Foundation (2019) for the calculation. Detailed calculations are in appendix 4. We conclude that there would be a $229 and $52 increase in payments due to children's and parents' increased longevity, respectively.

III.L. Increased Costs Due to Increased Education of Children

Through six studies (Thompson, 2019; Bastian & Michelmore, 2018; Maxfield, 2013; Akee et al., 2010; Michelmore, 2014; Aizer et al., 2016), we find that the $1,000 increase in household income per year from a cash transfer has a positive impact on the educational attainment of children. Even though we do not assign separate benefit values for the increased educational attainment due to potential double counting, we do take into account the costs it poses. To calculate additional costs associated with increased schooling, we use the six estimates on children's educational attainment and the cost of K-12 education according to the U.S. Census Bureau (2021). Detailed calculations are provided in appendix 4. Results imply that the present discounted value of the increased costs is $139 (individual values are $18, $49, $73, $104, $289 and $300).

IV. BENEFITS AND COSTS OF $1,000 INCREASE IN HOUSEHOLD INCOME FOR LOW INCOME FAMILIES FROM A CHILD ALLOWANCE.

IV.A. Standardized Results for a One-Child, Single-Parent, Low-Income Family

Table 3 synthesizes the calculations described above and presents mean estimates of the present discounted value of the benefits and costs for one-child, single-parent low-income households per $1,000 increase in household income from a $1,000 child allowance.

The long-term benefits to child beneficiaries of the child allowance are substantial. Future earnings increase by $1,444 per child per $1,000 increase in household income. The biggest improvements are in children's health in adulthood and longevity, representing over twice the initial investment. The long-term health and longevity benefits to a single parent are also substantial, at $816.

Indirect effects on taxpayers are much smaller in magnitude. The biggest benefit—$1,117—comes from reductions in expenditures and victim costs of crime, 77% of which is attributable to reductions in victim costs rather than reductions in taxes. Increased child earnings lead to increases in taxes they pay and decreases in other transfers they receive that are worth $303 and $20, respectively. Child welfare spending decline by $21. Increased schooling of children poses a cost of $139 to taxpayers. Health care costs decrease by $8 for children, $5 for parents, and by $110 for taxpayers. On the other hand, increased longevity of both the child and parent increase Social Security and Medicare transfers by nearly as much as the increase in taxes paid from increased earnings. And taxpayer costs increase as a result of a decline in parent taxes of $61.

All told, the present discounted value of the long-term benefits to society for a one-child, single-parent, low-income family are more than five times as large as the initial transfer of $1,000. However, the average family today has two children, and slightly more than half of families have two parents. Therefore, the aggregate benefits of a $1,000 child allowance (as shown later in table 4) will be even greater than that for a typical low-income family. On the other hand, the benefits to children and parents in high-income families are likely to be lower than they are for low-income families, as discussed in the following section.

IV.B. How Much Benefits Decline as Income Increases

If child allowances were extended only to low-income families, the results in table 3, once increased to adjust for family size, would be nearly the end of the story. However, child allowances extend to middle- and upper-income families, as well. Therefore, we need to examine the extent to which the benefits of a child allowance differ for families with more income. The more income a family already has, the smaller the likely effect of a given dollar change in income on either child or parent outcomes.[9] The extent to which child, parent, and social returns to additional income decline with the level of income is an empirical question. Unfortunately, good causal empirical evidence on this rate of decline is practically non-existent. We found only one study that qualifies; we discuss it and its implications next.

Løken, Mogstad, and Wiswall (2012) find that a one-standard-deviation increase in family income generated 0.74 additional years of education for children from low-income families, whereas children from richer families gained as little as 0.05 years of education. They find similar relationships when looking at effects of income increases on the probability of high school dropout and on IQ. Using Norwegian registry data matched with child outcome data, they examine the effects of increased family income in some coastal and near coastal regions of Norway, due to an oil boom in those regions, on these long-term child outcomes. The regions closest to the oil boom experienced the earliest and largest increases in family income, allowing the authors to use a difference-in-differences research design. Importantly for our purposes, the oil boom increased family incomes across the income distribution. The authors find that the effects of a given increase in family income are, as anticipated, greater for children in families with lower initial income. Indeed, they find negative effects of increases in income for children in families with very high

[9] The diminishing utility of a child allowance may appear similar to the concept of diminishing marginal utility of income, but it differs in that it does not require assumptions about the concavity of a utility function. Rather, it is a specific application of the notion of diminishing marginal returns to a single factor in production, which we refer to as the diminishing marginal investment value of income.

initial income. While interesting and worthy of further empirical investigation, we ignore the negative effects on very high-income families and focus instead on the income levels at which benefits begin to decline and at which benefits reach zero. Their estimates imply that the benefits would begin to decline at roughly $50,000 in family income and decline to zero when family income reaches about $100,000 in 2019 dollars.[10] We use these figures in our main estimates, while our sensitivity analyses examine higher and lower alternative values for the incomes at which benefits decline and at which they reach zero.

IV.C. Micro-Simulation Estimates

Having calculated the benefits and costs for an individual family and how they change with income levels, we calculate aggregate benefits and costs through micro-simulations.

IV.C.1. Costs and Distribution of Gross and Net Benefits

We calculated the cost and distribution of the benefits of creating a child allowance of $3,600 per child ages 0-5 and $3,000 per child ages 6-17, as in the 2021 ARP expansion of the CTC. We estimated the costs using data from the 2019 Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS) (Flood et al., 2020). Note that these cost estimates do not account for changes in administrative costs. In addition, as the Census Bureau does with their tax calculator (Wheaton & Stevens, 2016), we assume 100% take-up of the CTC and the simulated reforms. More generally, the methodology used in our micro-simulation, described in appendix 5, is patterned after that used by the Urban Institute for the NAS study on reducing child poverty and that used by the Congressional Budget Office (CBO), and it produces similar results when used to examine the same questions studied by those organizations (results available upon request).

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[10] We use data in Figure 1 and Table 4 in Løken, Mogstad, and Wiswall (2012) and convert Norwegian kroner into 2019 U.S. dollars. The effects of income increases appear, in Panels A, B, and C of Figure 1, to drop to zero by the time family income reaches approximately $100,000.

The net cost of the $3,600-$,3000 child allowance is $96.8 billion. Of that amount, $63.8 billion goes to families with incomes under $50,000, $23.1 billion to families with incomes between $50,000 and $100,000, and $9.8 billion to families with incomes above $100,000. At full implementation, where all eligible families are receiving the credit, around 72 million children and 39 million parents (as discussed below, we make the conservative assumption that only one parent in a two-parent household benefit from the cash transfers because many of our impact studies focus on mothers) would benefit from the expansion.

IV.C.2. Reductions in Work, Earnings, Taxes Paid, and Poverty

A child allowance increases parents' income and thereby can lead to some reduction in employment, hours worked, and earnings. The decrease in earnings is neither a benefit nor a cost to recipients, as they are simply spending some of their increased income on less work. But reductions in earnings lead to reductions in taxes paid, which is a benefit to recipients but a cost to taxpayers. Appendix 5 describes how we estimate the reduction in earnings from the micro-simulation. Accounting for both the share of parents who would stop working and the share who would reduce the number of hours worked, the $3000/$3600 child allowance leads to a reduction in earnings of $11.4 billion.[11] The amount of taxes paid by parents is expected to decrease as a result of the child allowance due to a reduction in labor force participation and hours worked. As described in section III.C, we assume that 21% of any change in earnings would be paid in federal, state, and local taxes, resulting in an aggregate decrease in taxes of $2.4 billion.

IV.D. Aggregate Benefits and Costs of Converting the Tax Credit into a Near Universal Child Allowance

[11] There is recent research that suggests no effects of ARP CTC expansion on work (Ananat et al., 2022). However, since there is not yet scholarly consensus over the impact of ARP CTC expansion on work, we make the conservative assumption here that there is a reduction in work after the expansion.

In this section, we put together the baseline estimate of benefits and costs for an individual family in table 3 with the estimated decline in benefits as income increases, as described in section IV.B, along with the actual income and numbers of children and parents we have estimated through our micro-simulation model, and obtain national aggregate benefits and costs for a near-universal child allowance of $3,600 per child ages 0-5 and $3,000 per child ages 6-17.

Moving from the benefits for a one-child, one-parent, low-income family to the benefits to all families with children raises estimation issues. While it is unlikely that fathers derive no health and longevity benefits from an increase in household income, some of our underlying evidence on parents is calculated from literature that limit their samples to mothers. Our main estimates assume that the benefits to a second parent equal zero, which is a conservative assumption. One of our sensitivity tests assumes that both parents in two-parent households derive the same benefits as mothers.

We also need to adjust benefits based on the number of children in a family. A two-child family gets twice as much income from the child allowance as a one-child family. Assuming economies of scale—which is, implicitly, what the previous empirical work from which we derive our estimates has done—a two-child family also generates twice as much future child benefits as a one child family per $1,000 of increase in family income: one set of future benefits for each of the two children in the family exposed to the $1,000 benefit. The research underlying our estimates is, in fact, based on previous periods during which the number of children in families was larger than is now the case. Therefore, effect sizes reported in the literature supporting our analysis account for increases in family incomes on the outcomes of each child who shared that income, representing more than two children, on average; hence, holding these effect sizes constant may understate the magnitude of impacts on fewer children per household today.

As estimated in the micro-simulation, the initial cost of the child allowance is $96.8 billion. Of the net initial costs, 66% of all costs represent payments to families with AGIs below $50,000, 24% of costs are for payments to families with AGIs between $50,000 to $100,000, and 10% of costs are for payments to families with AGIs above $100,000. We allocate full investment returns for families with incomes below $50,000, a linearly-decreasing set of returns, falling from full to zero, for families with incomes between $50,000 and $100,000, and zero returns for families with incomes above $100,000.

Finally, we need to take into account the effects of financing the child allowance on family income. To simplify the analysis, we assume that the child allowance is financed by taxes only on the incomes of families with incomes above $100,000. This simplification is consistent with, but less stringent than, President Biden's commitment to fund his proposals with increased taxes only on families with incomes above $400,000. In a sensitivity analysis, we illustrate the effects of an alternative financing method that substantially reduces the family income gains from the child allowance for low-income families.

Table 4 presents aggregate estimates of the annual benefits and costs of $3000/$3600 child allowance. Aggregate costs are approximately $97 billion. Children's future earnings in adulthood increase by $270 billion, more than two-and-one-half times the initial expenditure of $97 billion. As a consequence of the huge increase in earnings, $57 billion is recouped by taxpayers in the form of higher tax payments from these higher earnings. The biggest single benefit to children and society as a whole come from the substantial increases in children's health and longevity—valued at $424 billion, which greatly exceeds the cost of the credit by itself. These improvements in health, in return, also result in taxpayer savings of $16 billion in public health care costs, around $5.3 billion of which is savings in health insurance premiums. The gains to taxpayers from reductions in expenditures and victim costs of crime are also very large—$208 billion, only $48 billion of which are reductions in taxes (23% of $208 billion). Taxpayers also experience gains of $4 billion from avoided expenditures on child protective services. Because children get more years of schooling, taxpayers and society as a whole incur greater education costs of $26 billion. Because children and their parents live longer, taxpayers also incur an additional cost of $47 billion in increased Medicare and Social Security benefit payments, which is offset by benefits to those who live longer. The present discounted value of benefits for society equals $846 billion, nearly nine times the initial costs. Taxpayers receive long-term savings of $135 billion.

V. SENSITIVITY ANALYSES

Our estimates of the benefits and costs of a child allowance indicate that the initial cost of $97 billion to implement the $3000/$3600 child allowance will generate social benefits of $982 billion. In other words, we estimate that relative to other potential uses of GDP, this child allowance produces a large positive return. As described above, however, translating the estimates of the impacts of cash and near-cash transfers into estimates of aggregate benefits and costs requires a number of choices or assumptions. In this section, we examine the sensitivity of our results to alternative assumptions and to two alternative child allowances.

The top panel of table 5 examines alternative assumptions in our calculations one at a time. Each row presents the results of one deviation from our baseline assumptions. We place our baseline estimate at the first row in bold, then order the results by lowest (generated by our least positive set of alternative assumptions) to highest (generated by our most positive set of alternative assumptions) estimated social benefits. The first row of less positive assumption shows that using the smallest positive estimates of impacts instead of average estimates substantially reduces social benefits—to only $541 billion. The second row shows that if we follow Hendren and Sprung-Keyser (2020) and value health and life at only one-tenth of standard values, benefits as a whole to society decline from $982 billion to $541 billion, or a return of 5.6:1. Similarly, other alternatives resulting in smaller effects include: assuming a discount rate of 5% instead of 3%; assuming a steeper decline in the return to additional income (i.e., that families with incomes below $37,500 get 100% of the return, families with incomes between $37,500 and $75,000 get half the return, and families with incomes above $75,000 get no return); assuming that a 1% increase in health reduces health care expenditures by 0.19% rather than 0.84% (see estimates on minimum, average and maximum healthcare expenditure elasticity in appendix 4) or assuming excess burden equals 50% rather than 30% (see discussion on excess burden in note d of table 4). Total benefits with these attenuating assumptions range from $544 billion to $994 billion. All results remain positive — benefits exceed costs in every one of our sensitivity checks. As shown later, even a combination of multiple less positive assumptions cannot drive the benefits to be lower than costs.

Most of the more positive assumptions have relatively small effects on social benefits. Assuming that a 1% increase in health reduces health care expenditures by 1.48% rather than 0.84% leads social benefits to increase to $996 billion. If both recipient parents in the two-parent household receive benefits (instead of our assumption that only one parent in a two-parent household receives benefits), social benefits increase to $1,007 billion. Finally, if returns to the transfer decline less steeply then we assume as family resources increase, social benefits increase to $1,078 billion. Discounting future benefits by 1% rather than 3% or using maximum rather than mean impact estimates, by contrast, increases the value of future benefits to society as a whole substantially—to between $2,104 and $2,240 billion, or approximately a return of 22:1 to 23:1.

Some of the sensitivity results for taxpayers may appear counterintuitive or incongruous. The relatively small increase in taxpayer gains as compared to the huge increase in social benefits when using an interest rate of 1% rather than 3% is particularly striking. The lower interest rate magnifies all of the future recipient and social benefits, but also magnifies the cost to taxpayers that comes from extending the life of program beneficiaries in the last year of life and is therefore the most sensitive to discounting. The importance of this cost to taxpayers also shows up in the seemingly incongruous results for counting benefits for both parents rather than only one parent, where taxpayer gains remain unchanged and social benefits increase.

Panel B presents four combinations of extreme and near-extreme assumptions. The first row presents the results using the least positive assumptions: a mere 10% of the CBO values for life and health, a 5% discount rate, minimum positive impacts from published studies, steepest benefit decline with family income, 50% excess burden, a 0.19 elasticity of health expenditures with respect to health, and only one parent in the two-parent household benefitting from the transfer. Even in this circumstance, the benefits are higher than the costs, bringing $185 billion in net benefits to society as a whole. The second near-extreme result is also illuminating: if all the least positive assumptions are combined except for the low value of life and the 5% discount rate—and we use instead the standard CBO value and a 1% interest rate—then the social benefits are actually quite large, at around 9 times the fiscal costs. In view of the fact that there is no apparent reason to use such a low value of life and health that is counter to government practice, and given that the real rate of interest is now below 1%, these results suggest that in the current economic context, even the least positive assumptions suggest that a child allowance yields a very high return. The third and fourth rows present results for the most positive assumptions. When combining these—maximum impacts, less steep decline in returns as family income increases, a 1.48 elasticity of health expenditures with respect to health, a 1% discount rate, both parents in a two-parent household are affected by the transfer—benefits are $5,451 billion, or 56 times the initial costs. Taxpayers receive large long-term savings of $516 billion. The near-extreme example, which tightens the assumption about which families benefit from the allowance, results in benefits 51 times the costs, and taxpayers enjoy long-term savings of $458 billion.

Finally, we examine the benefits of two other child allowance proposals to examine the sensitivity of our results to both benefit levels and financing. We examine the benefits and costs of a less generous child allowance of $2,000 per child taken from the NAS Report: *A Roadmap to Reducing Child Poverty*. To simplify the analysis, we assume that, like the baseline $3,600- $3,000 program, it is financed by taxes on families with incomes over $100,000. We also examine the benefits and costs of a slightly more generous child allowance of $4,200 per child 0-5 and $3,000 per child 6-17, financed largely by reducing or eliminating other benefits for low-income families with children, including eliminating the child benefit in the EITC and eliminating TANF. The child allowance benefit levels and financing provisions are taken from Senator Romney's proposed child allowance. (Our estimates do not take account of any positive benefits of providing child allowances to mothers during the third trimester of pregnancy, which is part of the Romney proposal. See appendix 5 for more details of the Romney proposal and financing provisions.) Thus for both the $3000/$3600 child allowance and the $2,000 child allowance, table 3's estimates of benefits per child and adult per $1,000 increase in family income are translated into estimates of aggregate benefits and costs like those in table 4 only on the basis of how much family income increases as a result of the new child allowance benefit. To calculate aggregate benefits and costs of the child allowance financed mostly by cuts in other benefits to low-income families, we also need to calculate how much family income declines as a result of the loss in means tested benefits and increases in taxes.

Panel C in table 5 indicates that the $2,000 child allowance generates net social benefits of $382 billion, while the $3000/$4200 proposal generates social benefits of $613 billion. All three child allowances generate substantial benefits well in excess of costs. Even though the $3000/$4200 child allowance benefit levels are the highest, they generate lower social benefits than the $3000/$3600 child allowance because the financing reduces the net benefit gain to low-income families.

VI. CONTEXTUALIZING CHILD ALLOWANCE EFFECTS

In this section, we compare our estimate to that of canonical literature on public investment in children and previous literature on child allowances. One major source of public investment in lower-income children is through health care, and in particular through expanding the availability of public health insurance. In Janet Currie and Jonathan Gruber's canonical 1996 paper "Saving Babies: The Efficacy and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women," the authors examined the effects of Medicaid expansion on infant mortality and found that each $1.9 million (in 2019 dollars) spent on expansion saved one infant life. Given the value of a statistical life (VSL) described earlier in this paper, the benefit-cost ratio of this policy, were this the only benefit of Medicaid expansion, would be over five to one. Of course, the authors themselves find in a related paper (Currie and Gruber 1995) that there are also benefits of Medicaid expansion for other child outcomes, suggesting that a comprehensive benefit-cost analysis would raise this ratio still higher and putting the value of this investment in the range of our valuations of a child allowance in this paper.

Another major source of public investment in lower-income children is education. Estimates of the return to an additional year of schooling range from 7.2% (Angrist and Krueger 1991) to 26% (Jepsen, Troske, and Coomes 2014), with returns rising in more recent years (Katz and Autor 1999). Given an average expenditure of about $12,000 per student per year on K-12 education (U.S. Census Bureau 2021), the opportunity cost of an additional year of education valued using earnings of a full-time minimum wage worker, an employment-to-population ratio of about 62 percent (Bureau of Labor Statistics), and mean earnings per worker of about $53,000 per year over 40 years (Social Security Administration), discounted at a 3% rate, the benefit-cost ratio of K-12 investment would be between 4:1 and 10;1. Again, this estimate focuses on a single outcome, earnings, which suggests that a comprehensive benefit-cost analysis would raise this ratio still higher, again suggesting that our estimates reflect reasonable returns for investments in children.

Finally, the benefit-cost analysis in Heckman et al (2010) found benefits of Perry Pre-School to be 7 times the costs. These results indicate the high returns that previous efforts to increase investment in lower-income children have shown. Again, this research suggests large returns from a child allowance are reasonable.

Three other papers are relevant to the reasonableness of the magnitudes of our estimates. Holzer et al. (2008) find that the annual cost of child poverty is about 4% of GDP, while McLaughlin and Rank (2018), using the same methodology but counting a wider array of benefits, find the costs to be 5.4% of GDP—or, in 2018 dollars, between $800 billion (Holzer et al. and $1.1 trillion per year. Their estimates, like ours, suggest that a child allowance, which could substantially cut the rate of child poverty, would have a large return. But the estimates are not directly comparable. First, they count benefits only from eliminating poverty. We analyze a policy that extends to children in nearly all families, not just those who live in families with incomes below the poverty threshold; while we model benefits as declining with family income, we build on research showing non-zero benefits of additional income for children in families above the poverty line. Second, the child allowances we model do not eliminate child poverty, but rather only cut it by about 45%. Third, they use a different methodology, which begins with differences in experiences between children who grow up in poverty and those who do not while adjusting for putative genetic contributions to poverty between the two groups. A third paper, Hendren and Sprung-Keyser (2020), is closer to our approach in that they begin with quasi-experimental and experimental studies and thus include many of the same studies that we include. Though they focus on the marginal value of public funds rather than benefit-cost analysis, they find that in general the two kinds of analyses produce similar results. Their estimates suggest that cash and near-cash benefits would be at best a marginally good investment. But they only count the subset of potential benefits that happen to be measured in each program/study they review independently, rather than finding the central tendency of estimates for each type of benefit across programs and aggregating across different types of benefits measured in different evaluations.

VII. SUMMARY AND CONCLUSION

Our study entails some important limitations. The most serious is that we have made no attempt to estimate nonlinear dose-response relationships. One potential candidate for such a relationship is age: a few of the underlying studies found no benefits for older children, which we model, but there may be other nonlinearities as well. Another is the amount of the credit: increasing allowances from zero to $1,000 per child likely produces greater benefits than increasing allowances from $4,000 to $5,000. Future research should attempt to develop evidence around these dose issues.

Another serious limitation is the paucity of evidence in the existing literature on the degree to which the benefits of an increase in household income decline as income increases. It seems intuitively obvious that a $3,000 to $6,000 increase in family income will have larger positive effects on child development and parent health for families with incomes of less than $50,000 per year than it will for families with incomes of $100,000 or more. The only quasi-experimental study we could find on this point confirms this intuition with respect to child development. But this study (Løken, Mogstad, and Wiswall 2012) is based on the effect of a Norwegian oil boom on Norwegian children. Norway is a far more homogenous and egalitarian country than the U.S., with a much different constellation of social policy supports to families with children, so the gradient of effect sizes could easily differ. In the U.S. context, Chetty et al. (2016) find that the correlational improvement in adult longevity per $1,000 increase in income in the U.S. is constant across most of the income distribution, albeit using observational data rather than a quasi- or natural experiment; modeling the relationship between benefits and initial income in this way would raise our estimates of the benefits substantially. This relationship is central to the debate about the degree to which benefits should be targeted to lower income families, and more research on this topic is of the highest priority.

Also of high priority is research on the effects of transfers on plausible outcomes for which there is currently little causal evidence. These include the health and longevity of parents; we found much more research on the effect of cash transfers on the long-term outcomes of children than on the outcomes of parents, and particularly on fathers. In addition, we found no causal evidence on domestic violence or expenditures on special education. Further research is needed to examine the impact of cash and near-cash transfers on these benefits.

We also found no research on the direct effects of cash payments on health care costs and limited research on the relationship of health status to health care costs. The degree to which improvements in health translate into declines in health expenditures plays a critical role in determining the degree to which taxpayers benefit from cash transfers. Rigorous research on this point would improve the precision of the estimates that we provide here, and this relationship should be an important area for future research.

Finally, we made no attempt to correct for selection bias in research publication, or "publication bias", as we are skeptical of its existence in this case. Null findings or negative findings of impacts would be of great interest to the research community and some have been published. Many of the studies we have included have multiple outcomes and not all of them are statistically significant; further, one study does indeed report negative point estimates. We therefore interpret the relative lack of studies reporting ill effects of cash and near-cash transfers on children not as a result of publication bias, but rather a result of the low frequency of such results.

Our baseline estimates suggest that the cost of the $3000/$3600 child allowance is $97 billion per year and that the total benefit for society is $982 billion per year. While this benefit-cost ratio is quite high, it is in the same ballpark as other investments in children such as high-quality pre-k programs, public education, and Medicaid. We also conducted several sensitivity analyses. The sensitivity analyses indicate that there is a fair range of uncertainty about precisely how good an investment a child allowance represents. But in the current context, with the real interest rate being closer to 1% than 3%, the most plausible estimates suggest that a child allowance has a very large positive net return for U.S. society.

TABLES IN THE MAIN TEXT

Table 1. Conceptual table of monetary benefits (+) and costs (-) of a near-universal child allowance.

	Direct +	Indirect =	Total
	Beneficiaries	**Taxpayers**	**Society**
A. Child Allowance transfer	+	-	0
B. Increased future earnings of children	+	0	+
C. Increased future tax payments by children	-	+	0
D. Increased children's health and longevity	+	0	+
E. Increased parents' health and longevity	+	0	+
F. Avoided expenditures on children's and parents' health care costs	+	+	+
G. Avoided expenditures and victim costs of crime	0	+	+
H. Avoided expenditures on foster care	0	+	+
I. Avoided expenditures on other cash or near-cash transfers	-	+	0
J. Increased payment due to increased children's and parents' longevity	+	-	0
K. Increased expenditures due to increased educational attainment of children	0	-	-
L. Administrative costs	0	-	-
M. Excess burden for beneficiaries	-	0	-
N. Decreased tax payments from parents	+	-	0
O. Excess burden for taxpayers	0	-	-

Table 2. Estimated impacts of a $1,000 increase in household income as a result of a cash or near-cash transfer.

Panel A: Impact studies used for the calculation of benefits		**Panel B: Supplementary Impact studies**	
Author	***Impact***	***Author***	***Impact***
Children's earnings [a]		**Birthweight**	
Bailey et al. (2020)	$62*	Hoynes, Miller, and Simon (2015)	0.54%*
Bastian and Michelmore (2018)	$25+	Kehrer and Wolin (1979)	0.16%+
Aizer et al. (2016)	$127*	Almond, Hoynes, and Schanzenbach (2011)	1.19%+

Hoynes, Schanzenbach, and Almond (2016)	$249	Markowitz et al. (2017)	0.82-1.63%*
Price and Song (2018)	-$33	**Children's educational attainment**	
Children's health during childhood [b]		Thompson (2019)	0.04%*
Averett and Wang (2018)	0.02%+	Bastian and Michelmore (2018)	0.01%+
Children's health during adulthood [b]		Maxfield (2013)	0.08%
Bailey et al. (2020)	0.002%	Akee et al. (2010)	0.06%
Hoynes, Schanzenbach, and Almond (2016)	0.12%*	Michelmore (2014)	0.25%*
Price and Song (2018)	-0.008%	Aizer et al. (2016)	0.36%
Neonatal mortality		**Child receiving high school diploma**	
Almond, Hoynes, and Schanzenbach (2011)	0.0001 pp	Thompson (2019)	0.08%*
Child longevity		Akee et al. (2010)	0.29%+
Bailey et al. (2020)	0.02 years*	Bastian and Michelmore (2018)	0.01%+
Aizer et al. (2016)	0.105 years*	Michelmore (2014)	0.91%*
Crime		Maxfield (2013)	0.96%*
Bailey et al. (2020)	-0.009%	**Parent mental health**	
Child protection		Gangopadhyaya et al. (2020)	26%*
Berger et al. (2017)	0.23 pp	Boyd-Swan et al. (2016)	1%+
Parent health [b]			
Larrimore (2008)	0.04%		
Morgan et al. (2020)	0.03%+		
Evans and Garthwaite (2014)	0.11%+		
Price and Song (2018)	-0.11%*		
Parent longevity [b]			
Price and Song (2018)	-0.12%		
Aizer, Eli, and LIeras-Muney (2020)	2.23%		

Notes: *Results were statistically significant at the 5% level or better.
+Includes both statistically significant and non-significant results for two or more measures of the same outcome.
[a] All results are reported in 2019 dollars.

[b] All results in the children's health section, parents' health and longevity section are calculated and expressed as a percentage of the full QALY value of $128,000, as described later in section III.D.1.

Table 3. Present discounted value of monetary benefits and costs for one-child, single-parent low-income families per $1,000 increase in household income from a child allowance: Using mean impact estimates.

	Direct +	Indirect =	Total
	Beneficiaries	**Taxpayers**	**Society**
Increased future earnings of children	$ 1,444	$ 0	$ 1,444
Increased future tax payments by children	$ -303	$ 303	$ 0
Decreased neonatal mortality	$ 10	$ 0	$ 10
Increased children's health and longevity	$ 2,274	$ 0	$ 2,274
Increased parents' health and longevity	$ 816	$ 0	$ 816
Avoided expenditures on other cash or near-cash transfers	$ -20	$ 20	$ 0
Avoided expenditures on child protection	$ 0	$ 21	$ 21
Avoided expenditures and victim costs of crime	$ 0	$ 1,117	$ 1,117
Increased expenditures on children's education	$ 0	$ -139	$ -139
Avoided expenditures on children's health care costs [a]	$ 8	$ 67	$ 76
Avoided expenditures on parents' health care costs [a]	$ 5	$ 43	$ 48
Increased payment due to increased children's longevity	$ 229	$ -229	$ 0
Increased payment due to increased parents' longevity	$ 48	$ -48	$ 0
Decreased tax payments from parents [b]	$ 61	$ -61	$ 0
Child allowance transfer	$ 1,000	$ -1,000	$ 0
Administrative costs [c]	$ 0	$ -4	$ -4
Excess burden for taxpayers [d]	$ 0	$ -61	$ -61
Total [e]	$ 5,574	$ 28	$ 5,603

Notes: [a] Reductions in health care expenditures reduce both out-of-pocket costs to beneficiaries and public and private insurance costs to taxpayers. Out-of-pocket medical expenditures are about 11% of national health expenditures in 2019 (Centers for Medicare & Medicaid Services, 2019). We allocate 11% of the reduced health care costs to beneficiaries and 89% of the costs to taxpayers at large in the form of reduced taxes and insurance premiums.

[b] Details on how we estimated decrease in parent tax is included in appendix A.5.III.

[c] Based on administrative costs of Social Security benefits, we set administrative costs to 0.4% of costs of the allowance.

[d] Excess burden is assumed to be equal to 30% of the net increase or decrease in the present discounted value of taxes. Neither decreases in victim costs nor reductions in health insurance premiums, 77% and 33% respectively of total taxpayer benefits are counted in the calculation of excess burden.

[e] The number for the total may not be exactly the sum of the numbers in the columns due to rounding.

Table 4. Aggregate annual benefits and costs of a $3000/$3600 per child child allowance: Present discounted value using mean impact estimates (in $billions).

	Direct +	Indirect =	Total
	Beneficiaries	**Taxpayers**	**Society**
Increased future earnings of children	$ 270	$ 0	$ 270
Increased future tax payments by children	$ -57	$ 57	$ 0
Decreased neonatal mortality	$ 2	$ 0	$ 2
Increased children's health and longevity	$ 424	$ 0	$ 424

Increased parents' health and longevity	$ 63	$ 0	$ 63
Avoided expenditures on other cash or near-cash transfers	$ -4	$ 4	$ 0
Avoided expenditures on child protection	$ 0	$ 4	$ 4
Avoided expenditures and victim costs of crime	$ 0	$ 208	$ 208
Increased expenditures on children's education	$ 0	$ -26	$ -26
Avoided expenditures on children's health care costs [a]	$ 2	$ 13	$ 14
Avoided expenditures on parents' health care costs [a]	$ 0.4	$ 3	$ 4
Increased payment due to increased children's longevity	$ 43	$ -43	$ 0
Increased payment due to increased parents' longevity	$ 4	$ -4	$ 0
Decreased tax payments from parents [b]	$ 2.4	$ -2.4	$ 0
Child allowance transfer	$ 97	$ -97	$ 0
Administrative costs [c]	$ 0	$ -0.4	$ -0.4
Excess burden for taxpayers [d]	$ 0	$ 19	$ 19
Total [e]	$ 846	$ 135	$ 982

Notes: [a]Reductions in health care expenditures reduce both out-of-pocket costs to beneficiaries and public and private insurance costs to taxpayers. Out-of-pocket medical expenditures are about 11% of national health expenditures in 2019 (Centers for Medicare & Medicaid Services, 2019). We allocate 11% of the reduced health care costs to beneficiaries and 89% of the costs to taxpayers at large in the form of reduced taxes and insurance premiums.

[c] Details on how we estimated decrease in parent tax is included in appendix A.5.III.

[d] Based on administrative costs of Social Security benefits, we set administrative costs to 0.4% of costs of the allowance.

[e] Excess burden is assumed to be equal to 30% of the net increase or decrease in the present discounted value of taxes. Neither decreases in victim costs nor reductions in health insurance premiums, 77% and 33% respectively of total taxpayer benefits are counted in the calculation of excess burden.

[f] The number for the total may not be exactly the sum of the numbers in the columns due to rounding.

Table 5. Sensitivity analysis results (in $billions).

	Direct + Beneficiaries	**Indirect= Taxpayers**	**Total Society [a]**
Panel A: One at a Time Variations			
Baseline: $3000/$3600 per child	**$846**	**$ 135**	**$982**
Less positive assumptions			
Minimum positive benefits	$402	$ 139	$541
Lower-bound VSL & QALY	$406	$ 136	$541
Discount rate of 5%	$480	$ 65	$544
Steeper benefit decline-37.5-75K	$758	$ 104	$862
Smaller health expenditure elasticity-0.19	$845	$ 122	$967
Baseline with greater excess burden-50%	$846	$ 148	$994
More positive assumptions			
Larger health expenditure elasticity-1.48	$847	$ 149	$996
Both parents receive benefits	$871	$ 135	$1007
Less steep benefit decline-62.5-125K	$917	$ 161	$1078
Discount rate of 1%	$1922	$ 182	$2104
Maximum Benefits	$1990	$ 250	$2240

Panel B: Four Extreme and Near-Extreme Combinations			
Least positive	$148	$ 37	$185
Least positive except value of health and 1% interest rate	$660	$ 208	$868
Most positive, except include benefit decline for 50-100K	$4493	$ 458	$4951
Most positive	$4934	$ 516	$5451
Panel C: Alternative Program Guarantees and Financing			
Baseline: $3000/$3600 per child-Financing >$100,000	$846	$135	$982
$2,000 per child—Financing >$100,000	$319	$ 63	$382
$3000/$4200 per child-Financing includes welfare offsets	$561	$ 52	$613

Notes: [a.] The benefits/costs for the society may not be exactly the sum of benefits/costs for beneficiaries and taxpayers due to rounding.

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