


ARTICLE

The Benefits and Costs of a Child Allowance

Irwin Garfinkel¹, Laurel Sariscsany², Elizabeth Ananat^{1,3}, Sophie Collyer¹, Robert P. Hartley¹ , Buyi Wang^{1,*} and Christopher Wimer¹

¹Columbia University School of Social Work, New York, NY, USA

²Grace Abbott School of Social Work, University of Nebraska Omaha, Omaha, NE, USA

³Department of Economics, Barnard College, New York, NY, USA

*Corresponding author: e-mail: bw2733@columbia.edu

Keywords: benefit-cost analysis, child allowances, cash transfer, poverty

JEL classification: H53

Abstract

This article conducts a benefit-cost analysis of a child allowance. Through a systematic literature review of the highest quality evidence on the causal effects of cash and near-cash transfers, this article produces core estimates on the benefits and costs per child and per adult of increasing household income by \$1000, which can be used for any cash or near-cash program that increases household income. We then apply these estimates to three child allowance proposals, with the main proposal converting the \$2000 Child Tax Credit in the federal income tax code into a fully refundable and more generous child allowance of \$3600 per child ages 0–5 and \$3000 per child ages 6–17, as enacted for 1 year in the American Rescue Plan. Aggregate costs and benefits are estimated via micro-simulation. Our estimates indicate that making the \$2000 Child Tax Credit fully refundable and increasing benefits to \$3000/\$3600 would cost \$97 billion per year and generate social benefits of \$929 billion per year. Sensitivity analyses indicate that the results are robust to alternative assumptions and that each of the three child allowance proposals produces a very strong to an extraordinarily strong return for the U.S. population.

1. Introduction

As part of the federal income tax code, the Child Tax Credit currently provides a partially refundable tax credit of \$2000 per child. The credit reduces the tax burden by \$2000 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 \$2000 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 \$2000 child allowance (The international and historical context of child allowance and CTC is presented in Supplementary 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* (National Academies of Sciences Engineering and Medicine, 2019; henceforth “NAS report”). More recent proposals,

including the American Family Act and the recently enacted 1-year child allowance in the American Rescue Plan (ARP), contain more generous allowances: \$3600 for children ages 0–5 and \$3000 for children ages 6–17 (we refer to this as the \$3000/\$3600 child allowance). Senator Romney’s Family Security Act proposed even more generous allowances: \$4200 for children ages 0–5 and \$3000 for children ages 6–17 but was financed through cuts of other social programs. The NAS report also documented emerging evidence that cash transfers enhance child development and may therefore be a good investment. Building upon the findings of the NAS report, this article uses a comprehensive benefit-cost analysis to determine if establishing a child allowance in the USA is a sound public investment.

There are three papers that address issues closely related to this article. 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 and \$1.1 trillion per year. Their estimates, like ours, suggest that a child allowance would be a very good investment. But the estimates are not directly comparable. First, they count benefits only from eliminating poverty. We analyze a policy that extends to children in families of nearly all income levels. Second, the main child allowance proposal we model does not eliminate child poverty, but rather cuts 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 and then adjusts for 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 or aggregating across different types of benefits measured in different evaluations. Another key distinction between their approach and ours is that when calculating health benefits, they place a strikingly low value on life that is not consistent with other literature or government practice.

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 the 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. Nearly all have been published in the last decade. For child beneficiaries, impacts include future earnings and taxes paid, educational attainment, and four health outcomes: birth weight, neonatal mortality, health between 1 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 associated with the increase in educational attainment and longevity. We summarize the methodology, data, and findings of each study employed in our analysis and standardize their findings to reflect the effects of a \$1000 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 % social discount rate to discount the value of future benefits. For each benefit and cost, we estimate the value to society as a whole and, 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 article is organized as follows. [Section 2](#) presents and discusses a conceptual table of the benefits and costs of a child allowance. [Section 3](#) describes the methodology used in our benefit-cost analysis, highlighting the assumptions and rules that underlie our analyses, describes in brief the estimates for each benefit and cost in the conceptual table that result from an increase in family income of \$1000, and presents a summary table of the benefits and costs per \$1000 increase in household income for a single child and single parent low-income family. [Section 4](#) converts the estimated benefits and costs per \$1000 increase in household income for low-income families into estimates of aggregate benefits and costs for all families. [Section 5](#) conducts sensitivity analyses. [Section 6](#) summarizes and contextualizes our main findings and discusses limitations and future research.

2. Expected benefits and costs

[Table 1](#) describes the expected monetary benefits and costs of a child allowance. The 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 in the victim costs of crime and in health insurance premiums. Total benefits and costs are the net sum of direct and indirect benefits and costs. 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 that most beneficiaries are also taxpayers (in the case of children's parents) or will eventually be so (in the case of children). This approach of dividing the population into beneficiaries or taxpayers is not meant to convey that society is not a single interdependent entity, but rather simply to clarify the accounting of benefits and costs that accrue differentially across the population. Each row in the table provides a conceptual description of a potential benefit or cost. A plus indicates a benefit and a minus a cost. The main objective of a benefit-cost analysis is to attach dollar values to all of the benefits and costs listed in the table. Benefit-cost analyses normally focus on the last column, that is, the benefits and costs to society as a whole.

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 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

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

	Direct Beneficiaries	Indirect Taxpayers	Total 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	–	–

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–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.¹ 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.

¹ Health insurance premiums 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.

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.

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.²

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 Okun (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 that confront 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 that was not tied to the beneficiary's number of children.³ 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. Note that excess burden depends not only on the initial taxation for financing the child allowance, but also on the present discounted value of future increases and decreases in taxes and transfers. 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 – such as poverty reduction – are important, but because of space constraints are discussed in Supplementary Appendix 3.

3. Measuring impacts: study data, methods, findings, and standardization

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),

² 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.

³ Note that at higher incomes the transfers of child allowance phases out, but in our analysis, we ignore the price distortion with respect to the work-leisure choice caused by this phase out.

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

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 Supplementary Appendix 1. We found 21 studies that examine the impacts of a change in income on our outcomes of focus and met our stringent criteria.

Table 2 summarizes the impact estimates from the studies reviewed. Note first that all studies are limited to low-income families. At the end of this section, we deal with this issue. 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 children's birthweight and educational attainment and parents' mental health are labeled as supplementary, and we make this distinction because valuing them in dollar terms and adding them to the value of other benefits would involve double-counting benefits. Increases in years of schooling and declines in low birth-weight are used to calculate costs. Documenting these intermediate causal impacts also helps clarify ways that increased income affects the ultimate outcomes. With one exception, all the studies find beneficial impacts. Most find statistically significant impacts.

The remainder of this section describes briefly how we use standardized impacts calculated from the literature, attach shadow prices to the impacts, and obtain present discounted values of the future streams for each benefit and cost described in Table 3. Details of the literature and the standardization process are described in Supplementary Appendix 4.

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 families whose 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 article.

Table 2. Estimated impacts for low-income families of a \$1000 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
<i>Children's earnings</i> ^a		<i>Birthweight</i>	
Bailey <i>et al.</i> (2020)	\$62 ^b	Hoynes <i>et al.</i> (2015)	0.54% ^b
Bastian and Michelmore (2018)	\$25 ^c	Kehrer and Wolin (1979)	0.16% ^c
Aizer <i>et al.</i> (2016)	\$127 ^b	Almond <i>et al.</i> (2011)	1.19% ^c
Hoynes <i>et al.</i> (2016)	\$249	Markowitz <i>et al.</i> (2017)	0.82–1.63% ^b
Price and Song (2018)	−\$33	<i>Children's educational attainment</i>	
<i>Children's health during childhood</i> ^d		Thompson (2019)	0.04% ^b
Averett and Wang (2018)	0.02% ^c	Bastian and Michelmore (2018)	0.01% ^c
<i>Children's health during adulthood</i> ^d		Maxfield (2015)	0.08% ^c
Bailey <i>et al.</i> (2020)	0.002% ^c	Akee <i>et al.</i> (2010)	0.06% ^c
Hoynes <i>et al.</i> (2016)	0.116% ^b	Michelmore (2013)	0.25% ^b
Price and Song (2018)	−0.008%	Aizer <i>et al.</i> (2016)	0.31% ^c
<i>Neonatal mortality</i>		<i>Child receiving high school diploma</i>	
Almond <i>et al.</i> (2011)	0.0001 pp	Thompson (2019)	0.08% ^b
<i>Child longevity</i>		Akee <i>et al.</i> (2010)	0.29% ^c
Bailey <i>et al.</i> (2020)	0.0194 years ^b	Bastian and Michelmore (2018)	0.01% ^c
Aizer <i>et al.</i> (2016)	0.105 years ^b	Michelmore (2013)	0.91% ^b
<i>Crime</i>		Maxfield (2015)	0.96% ^b
Bailey <i>et al.</i> (2020)	−0.009%	<i>Parent mental health</i>	
<i>Child protection</i>		Gangopadhyaya <i>et al.</i> (2020)	26% ^b
Berger <i>et al.</i> (2017)	0.23 pp	Boyd-Swan <i>et al.</i> (2016)	1% ^c
<i>Parent health</i> ^d			
Larrimore (2011)	0.042% ^c		
Morgan <i>et al.</i> (2020)	0.030% ^c		
Evans and Garthwaite (2014)	0.039% ^c		
Price and Song (2018)	−0.106% ^b		
<i>Parent longevity</i> ^b			
Price and Song (2018)	−0.12%		
Aizer <i>et al.</i> (2020)	2.23%		
Chetty <i>et al.</i> (2016)	0.56%		

^aAll results are reported in 2019 dollars.

^bResults were statistically significant at the 5% level or better.

^cIncludes both statistically significant and non-significant results for two or more measures of the same outcome.

^dAll 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 \$126,628, as described later in the children's health section.

Table 3. Present discounted value of monetary benefits and costs for single child, single parent low-income families per \$1000 increase in household income: Using mean impact estimates (in \$).

	Direct Beneficiaries	Indirect Taxpayers	Total society
Child allowance transfer	1000	-1000	0
Increased future earnings of children ^a	1083	0	1083
Increased future tax payments by children	-303	303	0
Decreased neonatal mortality	10	0	10
Increased children's health and longevity	2250	0	2250
Increased parents' health and longevity	378	0	378
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	1746	1746
Increased costs of children's education	-302	-72	-374
Avoided expenditures on children's health care costs ^b	8	67	76
Avoided expenditures on parents' health care costs ^b	0.29	2.35	2.64
Increased payment due to increased children's longevity	229	-229	0
Increased payment due to increased parents' longevity	77	-77	0
Decreased tax payments from parents ^c	61	-61	0
Administrative costs ^d	0	-4	-4
Excess burden for taxpayers ^e	0	-219	-219
Total ^f	4473	497	4970

^aFuture earnings are valued at 75 % of the face value (\$1444). This is because some increases in earnings come from increased hours, and our upper bound estimate (to be conservative) is 25 %. To be conservative, we assume the recipient gets no surplus from increased earnings that come through additional hours.

^bReductions 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.

^cDetails on how we estimated decrease in parent tax is included in Supplementary Appendix A5.I.c.

^dBased on administrative costs of Social Security benefits, we set administrative costs to 0.4 % of costs of the allowance.

^eExcess burden is assumed to be equal to 40 % of the net increase or decrease in the present discounted value of taxes. Neither decreases in victim costs nor reductions in health insurance premiums, 71 and 33 % respectively of total taxpayer benefits are counted in the calculation of excess burden.

^fThe number for the total may not be exactly the sum of the numbers in the columns due to rounding.

3.1 Children's future earnings

We use the five studies in Table 2 to estimate the impact of a child allowance on children's future earnings in adulthood. Four studies examine the impacts of actual cash and near-cash programs – mothers' pensions, the EITC, and food stamps – while one is a long-term

follow-up to a Negative Income Tax (NIT) experiment. These studies and the methodology for standardizing the impacts in terms of a \$1000 increase in household income are described in detail in Supplementary Appendix 4. The four studies of the actual government programs show positive impacts. The NIT study by Price and Song finds a negative effect. We take the average impact of the five studies. We use Equation (1) below to calculate the present discounted value of future earnings gains, assuming that earnings begin at age 22 and continue until age 65, and that the average age of children is 9 years:

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

The present discounted value of future earnings is between $-\$555$ and $+\$4186$. 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 $\$1444$ as a result of $\$1000$ increase in household income from cash and near-cash transfers in childhood. In the sensitivity analysis, we examine alternatives. Finally, we estimate that 75 % of these earnings gains are due to increases in wage rates and 25 % to increases in hours worked⁵ and conservatively value the increase in earnings that comes from hour worked at zero to child beneficiaries. Thus only 75 % of the earnings gain ($\$1083$) is counted as a benefit.

3.2 Children's future taxes

Children's increased earnings will lead to increases in the taxes that they pay. (To calculate taxes paid, unlike the value of future earnings increases to the children we count 100 % of the earnings increase of $\$1444$.) 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 ($\$1444$) by 21 % yields an estimate of the present discounted value of increased taxes of $\$303$.

3.3 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 1 month of age onward, and increased longevity.

3.3.1 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

⁵ The estimated percentages are based on results of Altonji *et al.* (2022), who found that increased earnings due to increased education were almost entirely driven by increased hourly wages, but in a few occupations at most 25 % of increases come from increased hours.

changes in neonatal mortality. This may be an underestimate if people attach more value to reducing the risk of infant death than about reducing the risk of their own death. The latter is used for changes in health and longevity.

The VSL estimates the amount individuals are willing to pay to reduce the risk of death. Robinson and Hammitt (2016) suggest a VSL of \$4.2–\$13.7 million for the USA (in 2013 dollars), with the midpoint being \$9 million. The U.S. Department of Health and Human Services (DHHS) also uses these estimates in its *Guidelines for Regulatory Impact Analysis* (2017). Converting into 2019 dollars, VSL ranges from \$4.6–\$15 million, with a midpoint of \$9.9 million. We use the \$9.9 million as the baseline VSL value.

QALY quantifies the impact of disease burden on health and longevity. A QALY estimate for a given year ranges from 1 to 0, where 1 represents 1 year of perfect health and 0 represents death. If a life is valued at \$9.9 million and average life expectancy is 78 years, the per year value of life would be approximately \$126,628.⁶ Therefore, to be consistent, we value 1 year of perfect health at \$126,628.

3.3.2 *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 *et al.* (2011). Based on their estimates, we conclude that an annual \$1000 transfer during childhood decreases neonatal mortality by \$10.

3.3.3 *Children's health from 1 month of age onward*

This section describes literature on the impact of cash and near-cash transfers on children's health from 1 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 (Hoynes *et al.*, 2016; Price & Song, 2018; Bailey *et al.*, 2020). Based on these papers, we conclude that a \$1000 increase in household income from cash or near-cash transfer during childhood improves health in childhood by 0.02 % of QALY per year and (using the average impact across the three studies) improves health in adulthood by 0.037 % 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 \$335 and the present discounted value of health impact in adulthood is \$891 (individual values are −\$182, \$58, and \$2796 for individual papers).

⁶ This estimate is also very close to the midpoint within the range the WHO recommends using to value QALY (Marseille *et al.*, 2015).

3.3.4 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 Supplementary Appendix 4 for details), we conclude that a \$1000 increase in household income from a cash transfer during childhood increases longevity by between 0.0194 and 0.105 years. The present discounted value of increased longevity in adulthood is \$1024 on average (individual values are \$320 and \$1729) as a result of a \$1000 transfer during childhood. Adding present discounted values of increased longevity and increased health in childhood and adulthood yields a total increase of \$2250.

3.4 Avoided health expenditures for children

This section estimates the impact of a \$1000 cash transfer on health expenditures for children. In the sections below, we first discuss how our estimates on birthweight are used to estimate reductions in health expenditures in the first 6 months of life and obtain a present discounted value of \$8, then we discuss how our estimates on children's health in childhood and adulthood are used to estimate healthcare expenditure reductions from 6 months of age onward. Counting avoided expenditures in the first 6 months of life (\$8) and in subsequent childhood (\$12) and adulthood (\$56), we conclude that health expenditures decrease by \$76 per \$1000 transfer.

3.4.1 Decline in healthcare expenditures in first 6 months of life

As discussed in Supplementary Appendix 4, our estimate from Almond *et al.* (2011) indicates that a \$1000 cash transfer decreases the probability of low birthweight by 1.19%. 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. Results indicate a saving of \$8.

3.4.2 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 0.116 %. As described in detail in Supplementary 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). We also found one study (East & Friedson, 2020) which finds much larger declines in health expenditures from Food Stamps benefits amongst immigrants than our maximum estimate, but generalizability is questionable as the study is limited to immigrants who constitute only 10% of FS beneficiaries and have better health but less access to health care than the native born population. In the interest of being conservative, we ignore this study in our calculations. Through calculations in Supplementary Appendix 4, we conclude that health care savings equal \$12 in childhood and \$56 in adulthood.

3.5 Overall parent health

We use four studies to examine the impact of cash or near-cash transfers on parent health (Larrimore, 2011; Evans & Garthwaite, 2014; Price & Song, 2018; Morgan *et al.*, 2020). 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 Vital Statistics (Centers for Disease Control and Prevention, 2021)) and that an average child beneficiary is 9 years old, implying that the average parent in our data is 38 years old. We assume that the benefits extend throughout the remainder of the parent's life course until age 78. We find that a \$1000 increase in household income from a cash transfer improves parent health by between -0.106 and 0.042 % of QALY per year. Individual values for yearly benefit are $-\$134$, $\$38$, $\$49$, and $\$53$. The present discounted value of improved health is $\$32$ on average (individual values are $-\$3237$, $\$920$, $\$1268$, and $\$1178$).

3.6 Parent 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 *et al.* (2020). The search also yielded a very well-done paper that examines the longitudinal relationship between income and adult longevity, Chetty *et al.* (2016). Results from Chetty *et al.* (2016), Price and Song (2018), and Aizer *et al.* (2020) imply that the present discounted value of increased longevity is $\$346$ on average (individual values are $-\$45$, $\$868$, and $\$216$) as a result of a $\$1000$ transfer. Adding present discounted values of increased longevity and health yield an increase of $\$378$.

3.7 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 1 % increase in physical health, health expenditures decrease by 0.84 %. To calculate the present discounted value, as we did for the calculation of parent health benefits, 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 $\$2.64$ (individual values are $-\$264$, $\$75$, $\$96$, and $\$104$) as a result of a $\$1000$ cash transfer.

3.8 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. Results imply that the present discounted value of lowered child welfare spending is $\$21$ as a result of a $\$1000$ cash transfer.

3.9 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 \$1000 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).

3.10 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 use Heckman *et al.* (2010) and Garcia *et al.* (2020, 2021) to derive the dollar value of the benefit of crime reduction. Note that on average 71 % of crime reduction in the three papers is attributable to reduction in costs to crime victims. We conclude that the present discounted value of decreased crime per \$1000 increase in household income per year from a cash transfer is \$1746.

3.11 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. We conclude that there would be a \$229 and \$77 increase in payments due to children's and parents' increased longevity, respectively.⁷

3.12 Increased costs due to increased education of children

Six studies (Akee *et al.*, 2010; Micheltmore, 2013; Maxfield, 2015; Aizer *et al.*, 2016; Bastian & Micheltmore, 2018; Thompson, 2019), find that cash or near cash transfers have a positive impact on children's educational attainment. Since for most of these studies, an average child in the sample has 12 years of education, we regard these increases as increases in postsecondary education. 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 such costs, we use the six estimates on increases in children's educational attainment and the direct and opportunity cost of postsecondary estimated by Abel and Deitz (2014). Results indicate that for child beneficiaries, total costs of increased

⁷ One reviewer agreed that our treatment of extended life was in keeping with conventional practice but noted that an alternative approach would be to also count the transfers as an estimate of the social costs of extending life. While this perspective is debatable, we hasten to add that if we had included both the cash and health insurance costs as social costs rather than transfers, it would not have a big impact on the net social benefits – reducing them from \$929 billion to \$880 billion.

schooling amounts to an average of \$302. For taxpayers, total costs of increased schooling amounts to an average of \$72.

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 \$1000 increase in household income. The long-term benefits to child beneficiaries of the child allowance are substantial. Future earnings increase by \$1083 per child per \$1000 increase in household income. The biggest improvements are in children's health and longevity (\$2250), representing over twice the initial investment. The long-term health and longevity benefits to a single parent are also substantial, at \$378.

Indirect effects on taxpayers are much smaller in magnitude. The biggest benefit – \$1746 – comes from reductions in expenditures and victim costs of crime, 71 % 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 declines by \$21. Health care costs decrease by \$8 for children, \$0.29 for parents, and by \$69.35 for taxpayers. On the other hand, increased longevity of both the child and parent increase Social Security and Medicare transfers by more than the increase in taxes paid from increased earnings. Increased schooling of children poses a cost of \$72 to taxpayers. And taxpayer costs increase as a result of a decline in parent taxes of \$61.

However, the average family today has two children, and slightly more than half of families have two parents. Therefore, the aggregate benefits of a \$1000 increase in household income will be greater than that shown in Table 3 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. We discuss how we handle these issues in the section below.

3.13 *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 near 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.⁸ 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 *et al.* (2012) find that a 1-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

⁸ 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.

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.⁹ 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 0.

3.14 Micro-simulation estimates

We calculated the cost and distribution of the benefits of a child allowance of \$3600 per child ages 0–5 and \$3000 per child ages 6–17. We estimated the costs and the distribution of benefits using data from the 2019 Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS) (Flood *et al.*, 2020). 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 Supplementary 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).

The net cost of the \$3600–\$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.

Supplementary 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 As described in the section on children's future taxes, 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. The micro-simulation described in Supplementary Appendix 5 also produces estimates of child poverty reduction, one of the most important non-monetary benefits of a child allowance. The \$3000/\$3600 child allowance is estimated to reduce the child poverty rate by 45% (Center on Poverty and Social Policy, 2020).

⁹ The authors find negative effects of increases in income for children in families with very high 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 0.

¹⁰ We use data in Figure 1 and Table 4 in Løken *et al.* (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 0 by the time family income reaches approximately \$100,000.

¹¹ There is recent research that suggests no effects of ARP CTC expansion on work (Ananat *et al.*, 2021). However, since there has been no consensus yet over the impact of ARP CTC expansion on work, we decide to be conservative and assume that there is a reduction in work after the expansion.

4. Aggregate benefits and costs of converting the tax credit into a near-universal child allowance

In this section, we put together the standardized estimates of benefits and costs per \$1000 increase in household income for single child, single parent low-income families with the estimated decline in benefits as income increases, as described above, 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 \$3600 per child ages 0–5 and \$3000 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 and costs 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, and a three-child family gets three times as much. Transfer costs and benefits increase in tandem. But do the investment benefits of the child allowance double and triple as we go from one to two to three children? Do we need to take account of economies of scale? Do we need to take account of differing dosage responses? Ideally yes, in both cases, but in practice we do not have the data. Making adjustments for economies of scale would be inappropriate given the underlying literature which does not take account of economies of scale. For each of the impacts that we estimate, either we or the authors of the original studies calculate the impacts on a child (or on a parent) per \$1000 increase in household income. Assume for the moment that both when the underlying studies were conducted and at present, the average and the distribution of number of children in each household, and economies of scale were identical. In that case, on average, there is no need to adjust for economies of scale as whatever economies were present then are present now. It would be nice to know if the impacts differed by the number of children in the household, but the underlying studies do not tell us this. What we do know, however, is that the number of children per household has been falling over time, which means if we did adjust for a lack of perfect economies of scale in household consumption, the benefits today would be larger than our estimate. Similarly, we cannot make adjustments for dosage responses because the underlying studies provide no data on the issue. Whether that leads to an under or over estimate is not clear.

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 \$202 billion, approximately 2.08 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 \$420 billion. Considered as a health investment alone, this child allowance is a remarkably good investment. These improvements in children's and parents' health, in return, also result in taxpayer savings of \$13.18 billion in public health care costs, around \$4.39 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 – \$326 billion, only \$68 billion of which are reductions in taxes (21 % of \$326 billion). Taxpayers also experience gains of \$4 billion from avoided expenditures on child protective services. Because children get more years of schooling, children, taxpayers, and society as a whole incur greater education costs of \$56 billion, \$14 billion, and \$70 billion respectively. Because children and their parents live longer, taxpayers also incur an additional cost of \$49 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 \$929 billion, nearly 10 times the initial costs. Taxpayers enjoy long-term savings of \$243 billion.

5. 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 \$929.2 billion. In other words, we estimate that relative to other potential uses of GDP, this child allowance is a remarkably good investment in our nation's future. 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 ways of structuring a child allowance.

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 order the results by lowest to highest upper range of estimated social benefits, that is, in ascending magnitudes according to the assumptions' influence on total impacts. The first row shows that the standard range for estimating the ratio of excess burden bears little weight in the final calculation of social benefit. In the second row, we show that the result when using our lower bound assumption that only one parent benefits per family (also our central assumption in our main estimates) only differs by \$10 billion from including equal benefits for coparents where present, which is a 1 % difference. Our range of health expenditure elasticities taken from the literature spans from 0.19 to 1.48, which also only generates about a 1 % difference from the central estimate based on the average of the two. We follow a conservative choice in only counting 75 % of future earnings as a direct benefit from higher wages (assuming 25 %

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

	Direct Beneficiaries	Indirect Taxpayers	Total society
Child allowance transfer	97	-97	0
Increased future earnings of children ^a	202	0	202
Increased future tax payments by children	-57	57	0
Decreased neonatal mortality	2	0	2
Increased children's health and longevity	420	0	420
Increased parents' health and longevity	29	0	29
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	326	326
Increased costs of children's education	-56	-14	-70
Avoided expenditures on children's health care costs ^b	2	13	14
Avoided expenditures on parents' health care costs ^b	0.02	0.18	0.2
Increased payment due to increased children's longevity	43	-43	0
Increased payment due to increased parents' longevity	6	-6	0
Decreased tax payments from parents ^c	2.4	-2.4	0
Administrative costs ^d	0	-0.4	-0.4
Excess burden for taxpayers ^e	0	2	2
Total ^f	686	243	929

^aFuture earnings are valued at 75 % of the face value (\$1444). This is because some increases in earnings come from increased hours, and our upper bound estimate (to be conservative) is 25 %. To be conservative, we assume the recipient gets no surplus from increased earnings that come through additional hours.

^bReductions 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.

^cDetails on how we estimated decrease in parent tax is included in Supplementary Appendix A5.I.c.

^dBased on administrative costs of Social Security benefits, we set administrative costs to 0.4 % of costs of the allowance.

^eExcess burden is assumed to be equal to 40 % of the net increase or decrease in the present discounted value of taxes. Neither decreases in victim costs nor reductions in health insurance premiums, 71 and 33 % respectively of total taxpayer benefits are counted in the calculation of excess burden.

^fThe number for the total may not be exactly the sum of the numbers in the columns due to rounding.

from increased work hours are completely offset by the opportunity cost of time), again using the lower bound as our central estimate assumption, which contrasts to a net social benefit of \$996.6 billion if we were to count 100 % of future earnings.

The last three rows of panel A begin testing more sensitive parameter choices. In our central estimates, we assume that long-run returns to the transfer decline linearly as household incomes rise from \$50,000 to \$100,000, such that children from higher-income

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

	Total benefit to society (billions of dollars)	
A. One-at-a-time variations	Lower	Upper
Excess burden proportion {0.5, 0.3}	928.7	929.8
Share of benefits/costs to coparents {0 ^a , 1}	929.2 ^a	939.4
Health expenditure elasticity {0.19, 1.48}	917.0	941.4
Share of future earnings as direct benefit {0.75 ^a , 1}	929.2 ^a	996.6
Declining long-run benefit range {\$37.5–\$75 k, \$62.5–125 k}	813.4	1023.6
Value of a statistical life {\$4.6 m, \$15.0 m}	688.7	1164.7
Discount rate {0.05, 0.01}	503.8	2020.2
B. Multiple variations	Lower	Upper
Study estimates used by outcome {min, max}	612.1	1916.1
Extreme combinations of parameter/study estimates ^{b†}	274.1	6815.5
Alternative program designs {NAS-type, Romney-type}	362.7	579.0
C. Simulation-based variations	10th percentile	90th percentile
Baseline specifications over ranges noted above	341.0	2051.6
Include only positive study estimates	620.8	2486.9

Note: NAS-type estimates correspond to \$2000 child allowance financed by taxes on families with incomes over \$100,000, and the Romney-type estimates correspond to \$4200 per child aged 0–5 and \$3000 per child aged 6–17 financed with offsetting benefits from transfer programs and EITC child benefits. Simulation-based variations report the 10th and 90th percentiles of results based on 1,000,000 replications randomly sampling across parameter ranges and study estimates.

^aDenoted estimates correspond to our baseline specification as reported in Table 4.

^bExtreme combinations include the parameter choices in panel A corresponding to the lower range of estimates as well as the minimum positive estimates from the literature by outcome.

households (above \$100,000) have future outcomes unchanged by a child allowance when young. If the returns to transfers decline more steeply, beginning to fade at household income above \$37,500 and disappearing for households above \$75,000, then our estimate of the net social benefit would drop to \$813.4 billion; and, if returns decline less steeply then social benefits increase to \$1023.6 billion. The choice of long-run benefit returns accounts for possible differences of around 12 % of our central estimate. Our VSL assumptions are based on the suggested range of estimates in Robinson and Hammitt (2016), which we update to 2019 dollars so that they range \$4.6 million to \$15.0 million. This range of VSL estimates generates an approximately 25 % difference from our central estimate for the net social benefit, ranging from \$688.7 billion at the lower range to an upper estimate of \$1164.7 billion. (If, by contrast, we were to follow Hendren & Sprung-Keyser, 2020 and value health and life at only one-tenth of standard values, benefits as a whole to society would decline to \$524 billion.) Lastly, the most substantial assumption is the social discount rate, which we center at 3 % within a standard range from 5 to 1 %. A discount rate of 5 % would lead to

social benefits of \$503.8 billion, whereas a 1 % discount rate implies a net social benefit more than double our preferred estimate.

Panel B of *Table 5* explores sensitivity estimates that allow multiple variations. First, we recalculate the net social benefit using only the minimum positive study estimates by outcome (excluding the outlier negative estimates of long-run cash transfer effects). Second, we contrast these with estimates using the maximum study estimates by outcome. Using only the minimum positive studies would decrease our social benefit estimate by about 34 % and using only the maximum studies would double our social benefit estimate. If we further assume the minimum or maximum parameter choices as shown in panel A, the lower range of social benefit falls to \$274.1 billion with an upper range as high as \$6815.5 billion.

Another variation on our main analysis is to reconsider the policy design of a child allowance in terms of both benefit levels and financing. In the last row of panel B, we examine the social benefits of a less generous child allowance of \$2000 per child taken from the *NAS Report: A Roadmap to Reducing Child Poverty* (with assumed financing by income taxes on incomes over \$100,000, as in the baseline analysis) contrasted with a slightly more generous child allowance of \$4200 per child 0–5 and \$3000 per child 6–17 as proposed by Senator Romney with financing largely by reducing or eliminating benefits for low-income families with children, including eliminating the child benefit in the EITC and eliminating TANF.¹² We estimate that the \$2000 NAS-type child allowance generates net social benefits of \$362.7 billion, while the \$3000/\$4200 Romney-type proposal generates social benefits of \$579.0 billion. All three child allowances, including both of these alternative program designs and our main ARP-type design, generate substantial benefits well in excess of costs. Even though the \$3000/\$4200 Romney-type 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.

For a more careful exploration of combinations of parameter and study choices, we conduct a Monte Carlo analysis based on the ranges of parameter choices shown in panel A of *Table 5* and the ranges of study estimates by outcome. Panel C shows the 10th and 90th percentiles of 1,000,000 replications that randomly draw from a uniform distribution of each parameter range and randomly select one study estimate to use for each outcome. The 10th percentile estimate of the net social benefit is \$341.0 billion, and the 90th percentile estimate is \$2051.6 billion, a range that includes all of the variations in panel A. If we repeat the Monte Carlo exercise using only positive study estimates (assuming that additional income in childhood has non-negative effects on children's long-run outcomes and treating the 1 negative study out of 21 as an outlier), then we find that 80 % of random variations fall between the 10th percentile of \$620.8 billion net social benefit and the 90th percentile of \$2486.9 billion.

In *Figure 1*, we show a histogram of the results from 1,000,000 randomizations across our baseline parameter ranges and all study estimates used in the main analysis. Half of the estimates fall between \$562 billion and \$1416 billion, and the expected value across all combinations is \$1075 billion, a net social benefit about 15 % higher than our central estimate of \$929 billion. The distribution of potential social benefits has a long right tail extending to around \$6 trillion, and less than 1 % of the results are negative, with around

¹² The Romney-type proposal estimates do not account for the positive benefits of providing child allowances to mothers during the third trimester of pregnancy, which is part of the Romney proposal. See Supplementary Appendix 5 for more details of the Romney proposal and financing provisions.

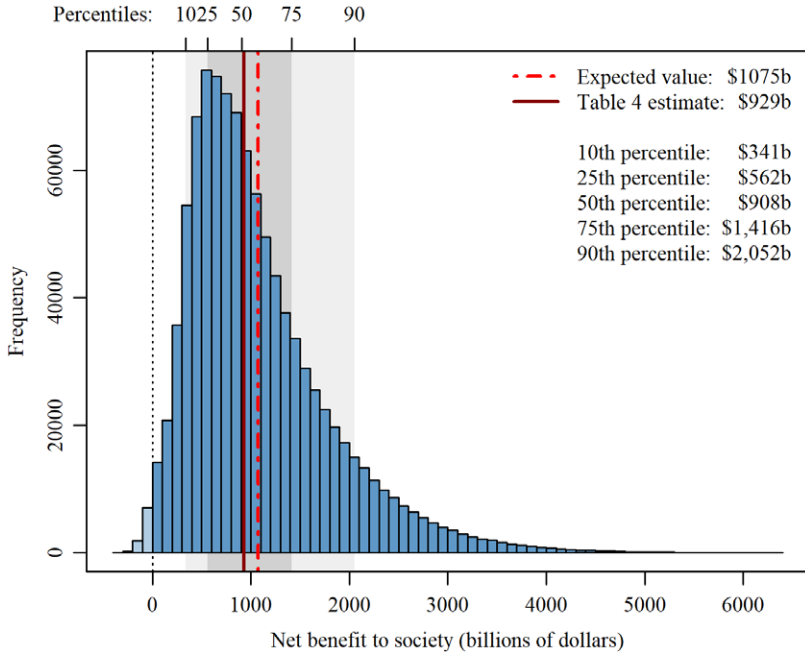


Figure 1. Histogram of simulation-based sensitivity estimates by parameter choices and study estimates. Estimates are based on 1,000,000 replications that vary by parameter choices given the ranges represented in Table 5 as well as the study estimates from the literature when more than one study is used for a given outcome.

2.3 % of results less than the initial outlay of \$97 billion. (The data exhibit a positive skewness of 1.35, a stronger tendency toward high net social benefits.) Note that these random draws assume equal weight to each study, including the negative results found by Price and Song (2018), and assume equal weight across each range of parameter choices based on a uniform distribution. If we were to place more weight toward the center of our parameter value ranges, for example by treating the range of values from which we draw as normally distributed and truncated within the maximum and minimum parameters, we would see a greater skewness toward larger net social benefits.¹³ In short, results in Table 5 and Figure 1 demonstrate that although there is a fair range of uncertainty about precisely how good an investment the \$3000/\$3600 child allowance is, the most plausible estimates range from it being a very good investment to an extraordinarily good investment in our nation’s future.

¹³In results not shown here, but available upon request, we repeat the Monte Carlo exercise given random draws of parameter values from a truncated normal distribution. For the means, we use values centered on the parameter ranges as shown in Table 5, Panel A, and we use standard deviations based on the uniform distribution for those ranges. We truncate parameter values within 2.5 times the standard deviation with a few pragmatic exceptions: we bound the lowest health expenditure elasticity at 0, we bound the share of coparent benefits counted to be within 0 and 1, and we bound the highest ratio of future earnings counted as direct benefits at 1. The skewness for these alternative results increases from 1.35 to 1.80, with an expected social benefit relatively unchanged at \$1074 billion.

6. Discussion

Our baseline estimates suggest that making the Child Tax Credit fully refundable and increasing its generosity is a remarkably good investment. The cost of the \$3000/\$3600 child allowance is \$97 billion per year and our best estimate of the total benefit for society is \$929 billion per year.

While the return on government expenditure is quite high, it is in the same ballpark as estimates derived from the canonical literature on public investment in children.

Recent literature on program evaluation has debated the relative merits of Benefit Cost Analysis (BCA) and the Marginal Value of Public Funds (MVPF) approaches to valuing the social value of a policy reform (see Hendren & Sprung-Keyser, 2020; García & Heckman, 2022; Hendren & Sprung-Keyser, 2022). While a full discussion of this topic is beyond the scope of this article, we note that the MVPF of the child allowance is extremely large, indeed “infinite” as defined by Hendren and Sprung-Keyser. Essentially, there is no cost to the government because the fiscal externalities associated with a child allowance sum up to a net benefit, not a cost, and the net positive fiscal externality exceeds the total cost to government. Therefore, the denominator for calculating the MVPF (government cost plus fiscal externality) implies that this statistic is undefined in this case, or that the marginal value of publicly funding a child allowance is arbitrarily large, or “infinite” as termed by Hendren and Sprung-Keyser.¹⁴

One major source of public investment in lower-income children is through health care, and a primary method for doing so is to expand 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 in this article, the return on government expenditure 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 & Gruber, 1996) that there are also benefits of Medicaid expansion for other child outcomes, suggesting that a comprehensive benefit-cost analysis would raise this return still higher. 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 & Krueger, 1991) to 26 % (Jepsen *et al.*, 2014), with returns rising in more recent years (Katz & 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 % (Bureau of Labor Statistics 2020), and mean earnings per worker of about \$53,000 per year over 40

¹⁴ To estimate the MVPF of a \$3000/\$3600 child allowance, we first assume that recipients’ willingness to pay for \$1 of child allowance transfers is \$1. In calculating personal benefits to the recipient, we convert each aggregate estimate in Table 4 to measure the benefit of a \$1 transfer, taking into account the aggregate cost of the child allowance – \$96,782,431,583. Personal benefits for recipients amount to \$6.65. Following Hendren and Sprung-Keyser (2020), we also include reduction in victimization cost of crime (\$2.39) as a WTP externality in the numerator. The numerator of MVPF is a sum of willingness to pay and personal benefits for recipients. The numerator of the MVPF is thus \$10.04 (\$1 ± \$2.39 + \$6.65). The denominator of the MVPF is the government program cost (\$1) plus fiscal externalities (*FE*). Fiscal externality amount to –\$1.1. Thus, the denominator of the MVPF is –\$0.1. The resulting MVPF is –97, suggesting that the program is infinitely valuable.

years (Social Security Administration 2020), discounted at a 3 % rate, the return on government expenditure of K-12 investment would be between 4 and 10 to 1. Again, this estimate focuses on a single outcome, earnings, which suggests that a comprehensive benefit-cost analysis would raise this return still higher. Finally, the benefit-cost analysis by Heckman *et al.* (2010) found social benefits of Perry Pre-School to be seven times the fiscal costs. These results indicate the high returns that previous efforts to increase investment in lower-income children have shown. In this context, large returns from a child allowance are plausible.

What is surprising is that cash transfers generate returns that may be as large as investments in health and education. The standard model assumes implicitly that a transfer of \$1 is worth \$1 to recipients and \$1 to taxpayers. We now have strong empirical evidence from 20 of 21 studies that a \$1 transfer is worth more than \$1 to low-income recipients and some empirical evidence from Norway that the loss of \$1 to high-income taxpayers may be no greater than \$1. Cash and near-cash transfers not only affect consumption but also serve as an investment in the human capital of children and of parents with regard to their health, which we now know yields positive returns to society. The increase in parent health is likely due to decreases in economic insecurity, which reduce stress and psychological burden. (Rosenblum & Paully, 1984; Lee *et al.*, 2013; Sendhil & Shafir, 2014; Garfinkel *et al.*, 2016). We further hypothesize that the increase in the human capital of the children is primarily due to changes in parenting and family contexts that result from reductions in stress and the psychological burdens of scarcity. Whatever the mechanisms, the empirical evidence indicates the benefits of increased income are large. We believe these returns remain unrealized in the absence of government intervention because of the credit constraints faced by lower-income families.¹⁵

Our study entails some important limitations. The most serious is that we have made no attempt to estimate dose response by age or by the generosity of program. A few of the underlying studies found no benefits for older age children, but one did (Bastian & Michelmore, 2018). Increasing allowances from zero to \$1000 per child must produce greater benefits than increasing allowances from \$4000 to \$5000. Future research should address these dose issues.

Another serious limitation is the paucity of evidence on the degree to which the benefits of an increase in household income decline as income increases. The only quasi-experimental study we could find (Løken *et al.*, 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 USA, with a much different constellation of social policy supports to families with children, so the gradient of effect sizes could easily differ. 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.¹⁶

Also of high priority is research on the effects of transfers on the health and longevity of parents, and particularly on fathers. We found much more research on the effect of cash transfers on the long-term outcomes of children than on the outcomes of parents. There are a

¹⁵ For an interesting alternative approach as to why a \$1 transfer to low-income recipients might be worth more than \$1, see Acland (2021).

¹⁶ Elango *et al.* (2016) discuss the issue of targeting in the context of early childhood education. Future studies could compare the relative social benefits by degree of income targeting as well as examine the role of popular support and legislative history for income maintenance program targeting.

few potential benefits of the child allowance that were not included in our analysis due to lack of quasi-experimental literature, such as decreased domestic violence and reduced expenditures on special education. Further research is needed to examine the impact of cash and near-cash transfers on these benefits.

We also did not take account of any increases in fertility based on the assessment of the NAS report: *A Roadmap to Reducing Child Poverty* that research found small and/or statistically insignificant impacts (cite). But a recent paper reports larger effects of a one-time maternity allowance in Spain (González & Trommlerová, 2021). As further new evidence emerges this is a potential topic for future research to explore.

We found only one study 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 publication bias because many of the studies we have included have multiple outcomes, not all of the multiple outcomes are statistically significant, and indeed some are negative.

Our baseline estimates suggest that making the Child Tax Credit fully refundable and increasing its generosity is a remarkably good investment. 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 social discount rate being closer to 1 than 3 %, the most plausible estimates range from a child allowance being a very good to being an extraordinarily good investment in our nation's future.

Supplementary Material. To view supplementary material for this article, please visit <http://doi.org/10.1017/bca.2022.15>.

Competing Interests. The authors declare none.

References

- Abel, Jaison R., and Richard Deitz. 2014. "Do the Benefits of College Still Outweigh the Costs?" *Federal Reserve Bank of New York—Current Issues in Economics and Finance*, 20: 9.
- Acland, Daniel. 2021. "Poverty, Irrationality, and the Value of Cash Transfers." *Journal of Benefit-Cost Analysis*, 2: 227–257.
- Aizer, Anna, Shari Eli, Joseph Ferrie, and Adriana Lleras-Muney. 2016. "The Long-Run Impact of Cash Transfers to Poor Families." *American Economic Review*, 106: 935–971.
- Aizer, Anna, Shari Eli, and Adriana Lleras-Muney. 2020. *The Incentive Effects of Cash Transfers to the Poor*. NBER Working Paper Series. Cambridge, MA: National Bureau of Economic Research.
- Akee, Randall K. Q., William E. Copeland, Gordon Keeler, Adrian Angold, and E. Jane Costello. 2010. "Parents' Incomes and Children's Outcomes: A Quasi-Experiment Using Transfer Payments from Casino Profits." *American Economic Journal: Applied Economics*, 2: 86–115.
- Almond, Douglas, Hilary W. Hoynes, and Diane Whitmore Schanzenbach. 2011. "Inside the War on Poverty: The Impact of Food Stamps on Birth Outcomes." *Review of Economics and Statistics*, 93: 387–403.
- Altonji, Joseph G., John Eric Humphries, and Ling Zhong. 2022. *The Effects of Advanced Degrees on the Wage Rates, Hours, Earnings and Job Satisfaction of Women and Men*. NBER Working Paper Series. Cambridge, MA: National Bureau of Economic Research.

- Ananat, Elizabeth, Benjamin Glasner, Christal Hamilton, and Zachary Parolin. 2021. Effects of the Expanded Child Tax Credit on Employment Outcomes: Evidence from Real-World Data from April to September 2021. Center on Poverty and Social Policy, C. U. Available at <https://static1.squarespace.com/static/5743308460b5e922a25a6dc7/t/6163c1c81d0509724688fab1/1633927625843/Child-Tax-Credit-Expansion-on-Employment-CPSP-2021.pdf> (accessed December 1, 2021).
- Angrist, Joshua D., and Alan B. Krueger. 1991. "Does Compulsory School Attendance Affect Schooling and Earnings?" *The Quarterly Journal of Economics*, 106: 979–1014.
- Averett, Susan, and Yang Wang. 2018. "Effects of Higher EITC Payments on Children's Health, Quality of Home Environment, and Noncognitive Skills." *Public Finance Review*, 46: 519–557.
- Bailey, Martha J., Hilary W. Hoynes, Maya Rossin-Slater, and Reed Walker. 2020. *Is the Social Safety Net a Long-Term Investment? Large-Scale Evidence from the Food Stamps Program*: Goldman School of Public Policy Working Paper.
- Bastian, Jacob, and Katherine Micheltore. 2018. "The Long-Term Impact of the Earned Income Tax Credit on Children's Education and Employment Outcomes." *Journal of Labor Economics*, 36: 1127–1163.
- Beam, Andrew L., Inbar Fried, Nathan Palmer, Denis Agniel, Gabriel Brat, Kathe Fox, Isaac Kohane, Anna Sinaiko, A. F. Zupancic John, and Joanne Armstrong. 2020. "Estimates of Healthcare Spending for Preterm and Low-Birthweight Infants in a Commercially Insured Population: 2008–2016." *Journal of Perinatology*, 40: 1091–1099.
- Berger, Lawrence M., Sarah A. Font, Kristen S. Slack, and Jane Waldfogel. 2017. "Income and Child Maltreatment in Unmarried Families: Evidence from the Earned Income Tax Credit." *Review of Economics of the Household*, 15: 1345–1372.
- Boyd-Swan, Casey, Chris M. Herbst, John Ifcher, and Homa Zarghamee. 2016. "The Earned Income Tax Credit, Mental Health, and Happiness." *Journal of Economic Behavior and Organization*, 126: 18–38.
- Bureau of Labor Statistics. 2020. Employment-Population Ratio. Available at <https://www.bls.gov/charts/employment-situation/employment-population-ratio.htm> (accessed August 1, 2021).
- Center on Poverty and Social Policy. 2020. A Poverty Reduction Analysis of the American Family Act. Available at <https://static1.squarespace.com/static/5743308460b5e922a25a6dc7/t/600f2123fdfa730101a4426a/1611604260458/Poverty-Reduction-Analysis-American-Family-Act-CPSP-2020.pdf> (accessed August 1, 2021).
- Centers for Disease Control and Prevention. 2021. National Vital Statistics Reports, 70. Available at <https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-02-tables-508.pdf#i06> (accessed August 1, 2021).
- Centers for Medicare & Medicaid Services. 2019. NHE Fact Sheet. Available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet> (accessed August 1, 2021).
- Centers for Medicare & Medicaid Services. 2019. Health Expenditures by Age and Gender. Available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Age-and-Gender> (accessed August 1, 2021).
- Centers for Medicare & Medicaid Services. 2020. National Health Expenditure Data: Projected. Available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-andReports/NationalHealthExpendData/NationalHealthAccountsProjected> (accessed August 1, 2021).
- Chern, Jin-Yuan, T. H. Wan Thomas, and James W. Begun. 2002. "A Structural Equation Modeling Approach to Examining the Predictive Power of Determinants of Individuals' Health Expenditures." *Journal of Medical Systems*, 26: 323–336.
- Chetty, Raj, Michael Stepner, Sarah Abraham, Shelby Lin, Benjamin Scuderi, Nicholas Turner, Augustin Bergeron, and David Cutler. 2016. "The Association Between Income and Life Expectancy in the United States, 2001–2014." *JAMA - Journal of the American Medical Association*, 315: 1750–1766.
- Criminal Justice Information Services Division. 2019. Arrest by Age. Available at <https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/tables/table-38> (accessed January 1, 2022).
- Currie, Janet, and Jonathan Gruber. 1996. "Saving Babies: The Efficacy and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women." *Journal of Political Economy*, 104: 1263–1296.
- Department of Agriculture. 2021. National Level Annual Summary: Participation and Costs, 1969–2019. Available at <https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap> (accessed August 1, 2021).
- DeSalvo, Karen B., Tiffany M. Jones, John Peabody, Jay McDonald, Stephan Fihn, Vincent Fan, Jiang He, and Paul Muntner. 2009. "Health Care Expenditure Prediction with a Single Item, Self-Rated Health Measure." *Medical Care*, 47: 440–447.
- East, Chloe N., and Andrew I. Friedson. 2020. "An Apple A Day? Adult Food Stamp Eligibility and Health-Care Utilization." *American Journal of Health Economics*, 6: 289–323.

- Eissa, Nada, and Hilary W. Hoynes. 2006. "Behavioral Responses to Taxes: Lessons from the EITC and Labor Supply." *Tax Policy and the Economy*, 20: 73–110.
- Elango, Sneha, Jorge Luis García, James J. Heckman, and Andrés Hojman. 2016. "Early Childhood Education." In Moffitt, Robert A. (Ed.) *Economics of Means-Tested Transfer Programs in the United States* (Vol. 2): 235–297. Chicago: University of Chicago Press.
- Evans, William N., and Craig L. Garthwaite. 2014. "Giving Mom a Break: The Impact of Higher EITC payments on Maternal Health." *American Economic Journal: Economic Policy*, 6: 258–290.
- Fang, Xiangming, Derek S. Brown, Curtis S. Florence, and James A. Mercy. 2012. "The Economic Burden of Child Maltreatment in the United States and Implications for Prevention." *Child Abuse & Neglect*, 36: 156–165.
- Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren. 2020. Integrated Public Use Microdata Series, Current Population Survey: Version 7.0. IPUMS.
- Gangopadhyaya, Anuj, Fredric Blavin, Breno Braga, and Jason Gates. 2020. "Credit Where it is Due: Investigating Pathways from Earned Income Tax Credit Expansion to Maternal Mental Health." *Health Economics*, 29: 975–991.
- García, Jorge Luis, Frederik H. Bannhoff, Duncan Ermini Leaf, and James J. Heckman. 2021. *The Dynastic Benefits of Early Childhood Education*. NBER Working Paper Series. Cambridge, MA: National Bureau of Economic Research.
- García, Jorge Luis, and James J. Heckman. 2022. *On Criteria for Evaluating Social Programs*. NBER Working Paper Series. Cambridge, MA: National Bureau of Economic Research.
- García, Jorge Luis, James J. Heckman, Duncan Ermini Leaf, and María José Prados. 2020. "Quantifying the Life-Cycle Benefits of an Influential Early-Childhood Program." *Journal of Political Economy*, 128: 2502–2541.
- Garfinkel, Irwin, Sara McLanahan, and Christopher Wimer (Eds.). 2016. *Children of the Great Recession*. New York: Russell Sage Foundation.
- Garfinkel, Irwin, Lee Rainwater, and Timothy Smeeding. 2010. *Wealth and Welfare States: Is America a Laggard or Leader?*. New York: Oxford University Press.
- Gauthier, Anne Helene, and Jan Hatzius. 1997. "Family Benefits and Fertility: An Econometric Analysis." *Population Studies*, 51: 295–306.
- Gold, Marthe R., Donald L. Patrick, George W. Torrance, Dennis G. Fryback, David C. Hadorn, Mark S. Kamlet, Norman Daniels, and Milton C. Weinstein. 1996. "Identifying and Valuing Outcomes." In Gold, Marthe R., Joanna E. Siegel, Louise B. Russell, and Milton C. Weinstein (Eds.) *Cost-Effectiveness in Health and Medicine*: 82–134. New York: Oxford University Press.
- González, Libertad, and Sofia Karina Trommlerová. 2021. "Cash Transfers and Fertility: How the Introduction and Cancellation of a Child Benefit Affected Births and Abortions." *Journal of Human Resources*. Available at <https://doi.org/10.3368/jhr.59.1.0220-10725R2> (accessed August 30, 2022)
- Heckman, James J., Seong Hyeok Moon, Rodrigo Pinto, Peter A. Savelyev, and Adam Yavitz. 2010. "The Rate of Return to the HighScope Perry Preschool Program." *Journal of Public Economics*, 94: 114–128.
- Hendren, Nathaniel, and Ben Sprung-Keyser. 2020. "A Unified Welfare Analysis of Government Policies." *The Quarterly Journal of Economics*, 135: 1209–1318.
- Hendren, Nathaniel, and Ben Sprung-Keyser. 2022. The Advantages of the MVPF: A Comment on García and Heckman (2022). Available at https://scholar.harvard.edu/files/hendren/files/traditionalmvpf_v20220412.pdf (accessed June 29, 2022).
- Holzer, Harry J., Diane Whitmore Schanzenbach, Greg J. Duncan, and Jens Ludwig. 2008. "The Economic Costs of Childhood Poverty in the United States." *Journal of Children and Poverty*, 14: 41–61.
- Hoynes, Hilary, Doug Miller, and David Simon. 2015. "Income, the Earned Income Tax Credit, and Infant Health." *American Economic Journal: Economic Policy*, 7: 172–211.
- Hoynes, Hilary, Diane Whitmore Schanzenbach, and Douglas Almond. 2016. "Long-run Impacts of Childhood Access to the Safety Net." *American Economic Review*, 106: 903–934.
- Internal Revenue Service. 2019. EITC Participation Rate by States. Available at <https://www.eitc.irs.gov/eitc-central/participation-rate/eitc-participation-rate-by-states> (accessed August 1, 2021).
- Jepsen, Christopher, Kenneth Troske, and Paul Coomes. 2014. "The Labor-Market Returns to Community College Degrees, Diplomas, and Certificates." *Journal of Labor Economics*, 32: 95–121.
- Joint Committee on Taxation. 2019. Estimates of Federal Tax Expenditures for Fiscal Years 2019–2023 JCX-55-19. Available at <https://www.jct.gov/publications/2019/jcx-55-19/> (accessed August 1, 2021).
- Kaiser Family Foundation. 2019. Medicare Spending Per Enrollee. Available at <https://www.kff.org/medicare/state-indicator/per-enrollee-spending-by-residence/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D> (accessed August 1, 2021).

- Katz, Lawrence F., and David H. Autor. 1999. "Chapter 26-Changes in the Wage Structure and Earnings Inequality." In Ashenfelter, Orley, and David Card (Eds.) *Handbook of Labor Economics* (Vol. 3A): 1463–1555. North Holland: Elsevier.
- Kehrer, Barbara H., and Charles M. Wolin. 1979. "Impact of Income Maintenance on Low Birth Weight: Evidence from the Gary Experiment." *The Journal of Human Resources*, 14: 434–462.
- Kneebone, Elizabeth. 2007. *A Local Ladder for Low-Income Workers: Recent Trends in the Earned Income Tax Credit*. Washington, DC: Brookings Institute. Available at <https://www.brookings.edu/research/a-local-ladder-for-low-income-workers-recent-trends-in-the-earned-income-tax-credit/> (accessed August 1, 2021).
- Kumlin, Staffan, and Bo Rothstein. 2005. "Making and Breaking Social Capital: The Impact of Welfare-State Institutions." *Comparative Political Studies*, 38: 339–365.
- Larrimore, Jeff. 2011. "Does a Higher Income Have Positive Health Effects? Using the Earned Income Tax Credit to Explore the Income-Health Gradient." *The Milbank Quarterly*, 86: 529–532.
- Lee, Dohoon, Jeanne Brooks-Gunn, Sara McLanahan, Daniel Notterman, and Irwin Garfinkel. 2013. "The Great Recession, Genetic Sensitivity, and Maternal Harsh Parenting." *Proceedings of the National Academy of Science*, 110: 13780–13784.
- Lima, Viviane Dias, and Jacek A. Kopec. 2005. "Quantifying the Effect of Health Status on Health Care Utilization Using a Preference-Based Health Measure." *Social Science and Medicine*, 60: 515–524.
- Løken, Katrine V., Magne Mogstad, and Matthew Wiswall. 2012. "What Linear Estimators Miss: The Effects of Family Income on Child Outcomes." *American Economic Journal: Applied Economics*, 4: 1–35.
- Markowitz, Sara, Kelli A. Komro, Melvin D. Livingston, Otto Lenhart, and Alexander C. Wagenaar. 2017. "Effects of State-Level Earned Income Tax Credit Laws in the U.S. on Maternal Health Behaviors and Infant Health Outcomes." *Social Science and Medicine*, 194: 67–75.
- Marseille, Elliot, Bruce Larson, Dhruv S. Kazi, James G. Kahn, and Sydney Rosen. 2015. "Thresholds for the Cost-Effectiveness of Interventions: Alternative Approaches." *Bulletin of the World Health Organization*, 93: 118–124.
- Maxfield, Michelle. 2015. *The Effects of the Earned Income Tax Credit on Child Achievement and Long-Term Educational Attainment*. Greenville, SC: Institute for Child Success. Available at <https://www.instituteforchildsuccess.org/publication/effects-earned-income-tax-credit-child-achievement-long-term-educational-attainment/> (accessed August 1, 2021).
- McLaughlin, Michael, and Mark R. Rank. 2018. "Estimating the Economic Cost of Childhood Poverty in the United States." *Social Work Research*, 42: 73–83.
- Micheltore, Katherine. 2013. "The Effect of Income on Educational Attainment: Evidence from State Earned Income Tax Credit Expansions." *SSRN Electronic Journal*.
- Morgan, Erin R., Heather D. Hill, Stephen J. Mooney, Frederick P. Rivara, and Ali Rowhani-Rahbar. 2020. "State Earned Income Tax Credits and General Health Indicators: A Quasi-Experimental National Study 1993–2016." *Health Services Research*, 55: 863–872.
- National Academies of Sciences Engineering and Medicine. 2019. *A Roadmap to Reducing Child Poverty*. Washington, DC: The National Academies Press.
- Okun, Arthur M. 1975. *Equality and Efficiency: The Big Tradeoff*. Washington, DC: Brookings Institute Press.
- Pac, Jessica, Sophie Collyer, Christopher Wimer, Lawrence Berger, Jane Waldfogel, Peter Pecora, Whitney Rostad, Kirk O'Brien, and Elizabeth Parker. 2020. The Effects of Child Poverty Reductions on Child Maltreatment and Placement into Out-of-Home Care. Prepared for the 2020 November APPAM Panel on Child Protective Services, Inequality, and Economic Insecurity.
- Page, Benjamin I., and Lawrence R. Jacobs. 2009. *Class War? What Americans Really Think about Economic Inequality*. Chicago: University of Chicago Press.
- Price, David J., and Jae Song. 2018. "The Long-Term Effects of Cash Assistance," Princeton University Industrial Relations Section, Working Paper #621.
- Robinson, Lisa A., and James K. Hammitt. 2016. "Valuing Reductions in Fatal Illness Risks: Implications of Recent Research." *Health Economics*, 25: 1039–1052.
- Rosenblum, Leonard A., and Gayle S. Paulty. 1984. "The Effects of Varying Environmental Demands on Maternal and Infant Behavior." *Child Development*, 55: 305–314.
- Scholz, John K. 1994. "The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness." *National Tax Journal*, 47: 63–87.
- Scott, Christine, and Margot L. Crandall-Hollick. 2014. The Earned Income Tax Credit (EITC): An Overview. Available at <https://www.hsdl.org/?view&did=752265> (accessed August 1, 2021).

- Sendhil, Mullainathan, and Eldar Shafir. 2014. *Scarcity: The True Cost of Not Having Enough*. London: Penguin Books.
- Social Security Administration. 2019. Fast Facts & Figures about Social Security, 2019. Available at https://www.ssa.gov/policy/docs/chartbooks/fast_facts/2019/fast_facts19.pdf (accessed August 1, 2021).
- Social Security Administration. 2020. National Average Wage Index. Available at <https://www.ssa.gov/oact/cola/AWI.html> (accessed August 1, 2021).
- Tax Policy Center. 2021. Key Elements of the U.S. Tax System. Available at <https://www.taxpolicycenter.org/briefing-book/what-earned-income-tax-credit> (accessed August 1, 2021).
- Thompson, Owen. 2019. "Tribal Gaming and Educational Outcomes in the Next Generation." *Journal of Policy Analysis and Management*, 38: 629–652.
- U.S. Accountability Office. 2001. Earned Income Tax Credit Eligibility and Participation. Available at <https://www.gao.gov/products/gao-02-290r> (accessed August 1, 2021).
- U.S. Census Bureau. 2021. Public School Spending per Pupil Increases by Largest Amount in 11 years. Available at <https://www.census.gov/newsroom/press-releases/2021/public-school-spending-per-pupil.html> (accessed August 1, 2021).
- U.S. Department of Health and Human Services. 2017. Guidelines for Regulatory Impact Analysis. Available at https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//171981/HHS_RIAGuidance.pdf (accessed June 23, 2022).
- U.S. Senate and Congress. 1978. *Welfare Research and Experimentation*. Washington, DC: U.S. Government Printing Office.
- UNICEF. 2020. Neonatal Mortality. Available at <https://data.unicef.org/topic/child-survival/neonatal-mortality/> (accessed August 1, 2021).
- Wamhoff, Steve, and Matthew Gardner. 2019. Who Pays Taxes in America in 2019? Institute on Taxation and Economic Policy. Available at <https://itep.org/who-pays-taxes-in-america-in-2019/> (accessed August 1, 2021).
- Wheaton, Laura, and Kathryn Stevens. 2016. *The Effect of Different Tax Calculators on the Supplemental Poverty Measure*: United States Census Bureau Working Papers.
- Whitmore, Diane. 2002. "What are Food Stamps Worth?" Princeton University Industrial Relations Section, Working Paper #847.