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Exploring the Effects of Medicaid During Childhood on the Economy and the Budget

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Abstract

This paper examines the short- and long-term fiscal effects of Medicaid spending on children. In the short run, costs for Medicaid are paid upfront when the children (or their mothers) receive health care. In the long run, Medicaid enrollment during childhood has been shown to increase earnings in adulthood. Those higher earnings imply greater tax revenues and lower transfer payments by the federal government in the future. On a present-value basis, the Congressional Budget Office estimates that long-term fiscal effects of Medicaid spending on children could offset half or more of the program's initial outlays, depending on sets of reasonable parameter values. That estimate is sensitive to the discount factor used to convert future effects to current dollars because long-term returns take over 70 years to fully materialize. The results are also sensitive to the predicted effect of Medicaid enrollment during childhood on earnings in adulthood (a parameter not known with precision) and to whether the changes in federal Medicaid spending come from noninvestment spending or from changes in federal borrowing.

Keywords: childhood Medicaid, health care, long-term dynamic analysis, means-tested transfers, federal budget, labor market outcomes

JEL Classification: H20, H50, H60, I13, J3

Notes and Definitions

Unless this working paper indicates otherwise, all years referred to are calendar years, and all values are reported in 2023 dollars and rounded to the nearest hundred. Numbers in the text, figures, and tables may not sum to totals because of rounding. The precision of the data underlying the figures in this working paper was chosen to improve the graphical presentation and does not indicate the Congressional Budget Office's certainty about the estimates.

A companion blog post, which summarizes some of the findings in this paper and discusses issues related to policies that have upfront costs and long-term budgetary effects, is available at www.cbo.gov/publication/59306.

Affected children are people up to age 18 who are simulated to change Medicaid enrollment status—either gaining or losing one year of enrollment—as a result of a policy. For children affected in utero, the change in enrollment would be less than a year.

The **baseline** describes a benchmark against which the budgetary effects of the illustrative policies are measured. In this analysis, the baseline refers to CBO's projections of earnings, federal taxes, and federal spending on transfer programs that would occur under current law as projected in the agency's budget and economic baseline as of May 2022 (CBO, 2022a). The projections used in this analysis follow CBO's 30-year extended baseline and hold constant most of the concepts underlying those projections for the duration of the projection period, until all affected children have reached age 65.

Capital income refers to income generated from the net return on capital assets used in the production of goods or services.

Conventional cost estimates refer to estimates of the budgetary effects of legislation which, by long-standing practice, incorporate the assumption that nominal gross domestic product (GDP) is unchanged.

Crowding out refers to the reduction in private-sector investment stemming from greater public borrowing. It increases interest rates and lowers income economywide, boosting interest costs and reducing revenues.

Discount factors refer to numbers between zero and one used to discount future cash flows to their present values. A discount factor close to one means that cash flows in the distant future are worth nearly as much as those in the present, whereas a lower discount factor means that future cash flows are less valuable than those in the present. Discount factors are related to but distinct from discount rates. **Discount rates** are the future rate of return expected from various investments, such as Treasury securities, other bonds, and stocks. If the discount rate is p, then the discount factor t years from the present is $1/(1+p)^t$. For fixed t, discount factors are higher

with lower discount rates, and for fixed *p*, discount factors are lower for higher values of *t* (that is, farther into the future). Two sets of discount factors—U.S. Treasury and fair-value—are used in this analysis to convert future sums to present values. Treasury rate discount factors reflect the government's cost of borrowing, whereas fair-value discount factors are lower than Treasury rate discount factors because they account for market risk.

In **dynamic analyses**, CBO studies how proposals that would significantly change federal spending and tax policies would affect the overall economy, as well as how such effects would feed back into the federal budget.

Earnings refer to earned income before accounting for noncash benefits, means-tested transfers, and federal taxes.

The **earnings effect** is the effect of a change in Medicaid enrollment during childhood on earnings in adulthood.

Family income refers to the combined total income (both labor and capital income) received by all members of a family before accounting for means-tested transfers and federal taxes.

Labor income refers to employees' total compensation, including earnings and benefits, before accounting for means-tested transfers and federal taxes.

Long-term fiscal effects of Medicaid spending on children refer to future changes in the budget of the federal government (reflecting changes in revenues and spending) that take place when people affected by a Medicaid policy in childhood reach adulthood (ages 20 to 65). Most, but not all, long-term outcomes occur outside the standard 10-year budget period.

Present value expresses the flows of current and future income or payments in terms of a single number. That number, in turn, depends on the discount factor used to translate future cash flows into current dollars.

A **synthetic panel** is a constructed panel of children who generally resemble current Medicaid enrollees. The distribution of children by age and family income varies slightly across illustrative policies based on who CBO expects would be affected.

Taxes refer to federal taxes on labor and capital income.

Transfer payments are cash payments and in-kind benefits made through means-tested programs. The means-tested programs included in this analysis are housing subsidies, the Low Income Home Energy Assistance Program, Medicaid, Medicare Low Income Subsidy, the National School Lunch Program, the Supplemental Nutrition Assistance Program, Supplemental Security Income, and Temporary Assistance for Needy Families.

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Introduction

Various federal, state, and local government programs subsidize food, health care, and other benefits for children from lower-income families. A body of research has shown that such aid, in addition to supporting those children during their childhood years, could also improve their eventual labor market outcomes. Those improved labor market outcomes would boost future gross domestic product (GDP) and hence affect taxes and transfers in the longer term (often referred to as dynamic effects). This Congressional Budget Office paper compares the short-run cost of an additional year of Medicaid spending to the present value of the longer-term dynamic fiscal effects. The results depend on several factors, including which discount factors are used (which is very important given the long horizon during which the dynamic effects materialize), how the increased spending is financed, and the age and family income of the children receiving Medicaid.

By contrast, per long-standing practice, CBO's conventional cost estimates only include the nominal changes in federal spending on children that would occur in a 10-year projection period.[1] Further, conventional cost estimates incorporate the assumption that nominal GDP remains unchanged, and they do not capture dynamic fiscal effects.[2] This paper is part of CBO's effort to expand its capacity to analyze policies with long-term fiscal effects. Another recent example of such analysis is CBO's report on increasing federal spending on physical infrastructure.[3]

This paper uses Medicaid as an illustrative example, and the analytic framework developed here can be applied to other programs affecting children. That framework first projects children's future earnings with and without proposed changes to Medicaid policy. Baseline future earnings are calculated on the basis of the family income of children currently enrolled in Medicaid, and future earnings under illustrative policies are calculated as a percentage change from those baseline earnings.[4] CBO also projects the changes in capital income that would be induced by higher labor productivity.

CBO then estimates the budgetary effects of those illustrative changes by multiplying changes in earnings and capital income by the agency's projection of the applicable federal marginal tax rates. The revenue changes include taxes on earnings and capital income, including refundable

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[1] The 10-year period used for baseline projections and legislative cost estimates comprises the current year and the following 10 fiscal years.

[2] For more information about CBO's cost-estimating process, see CBO (2023).

[3] That paper evaluates the budgetary effects over 30 years and includes the long-run effects of infrastructure investment on private-sector productivity and economic growth (CBO 2021a).

[4] Family income refers to the combined total income (both labor and capital income) received by all members of a family before accounting for transfers and taxes.

tax credits. The spending changes include federal spending on major means-tested programs.[5] Finally, those fiscal effects are discounted to present dollars using one of two discount factors.

Many low-income children and pregnant women receive health insurance through Medicaid, a joint federal and state program that assists with medical costs for people with limited income and resources. This paper studies the fiscal effects of childhood Medicaid because of the relatively large evidence base on that program's effects on future earnings (Brown, Kowalski, and Lurie 2020; Goodman-Bacon 2021; Miller and Wherry 2019). Based on its literature review, CBO projects that children who gain (or lose) a year of Medicaid enrollment would earn approximately 0.5 percent more (or less) per year as adults compared with those whose Medicaid enrollment did not change. CBO also projects that the effects vary by the age and family income of the children exposed to the policy—in particular, the effects are larger for children whose enrollment changes at younger ages and who are from lower-income families.

The analysis considers two illustrative policies. One would increase children's enrollment in Medicaid, and the other would decrease it. The first policy requires that all states provide children with 12 months of continuous Medicaid eligibility, allowing them to remain enrolled for a 12-month period regardless of changes in family income or other factors that affect their eligibility for Medicaid. That policy became law in the Consolidated Appropriations Act, 2023 (Public Law 117-328), and the results discussed here are the expected effects of that enacted policy change. That policy affected 27 states and the District of Columbia—places that had not provided continuous eligibility for children as of January 2023 (Kaiser Family Foundation 2023c). In CBO's assessment, that policy change will increase Medicaid enrollment among children in those affected states.

The second policy would establish block grants to states, and the amounts of those grants would be below CBO's projection of federal spending on Medicaid under current law. Under that illustrative policy, CBO projects that states would make the enrollment process more difficult, check eligibility criteria more often, or charge copayments or premiums to the extent allowable under Medicaid. Those states' actions would in turn reduce Medicaid enrollment among children in all states. Because it is uncertain whether such actions would target the enrollment of infants and pregnant women, CBO considered two versions of the second policy: Version A would make changes for children age 1 or older and not make any changes to enrollment in utero and

[5] Those programs include housing subsidies, the Low Income Home Energy Assistance Program, Medicaid, Medicare Low Income Subsidy, the National School Lunch Program, the Supplemental Nutrition Assistance Program, Supplemental Security Income, and Temporary Assistance for Needy Families. Refundable tax credits, such as the earned income tax credit and the premium tax credits (refundable credits for eligible individuals and families that purchase health insurance through the health insurance marketplaces established by the Affordable Care Act), are included as part of the revenue effect.

during infancy, and version B would make changes to enrollment in utero and for children of all ages.

CBO considers two ways in which changes in Medicaid spending would affect the federal deficit. In its main analysis, changes in federal Medicaid spending come from changes in federal noninvestment purchases, leaving the federal deficit (and interest payments on federal debt) unchanged. CBO also considers the case in which changes in federal Medicaid spending come from changes in federal borrowing.

To assess the size of the resulting fiscal effects, CBO compares long-term Medicaid fiscal effects with the initial change in Medicaid spending. For example, if the initial increase in Medicaid spending is $1,700 per affected child and comes from reducing noninvestment purchases (so the Medicaid spending increase is fully offset by a reduction in other spending), then CBO estimates the long-term fiscal effects per affected child as follows:

- Using Treasury rate discount factors, the fiscal effect reduces the present value of the future federal deficit by about $3,400—or by a ratio of almost 2 to 1.[6]
- Using fair-value discount factors, the fiscal effect reduces the present value of the future federal deficit by about $800—or by a ratio of about 0.5 to 1.

The long-term fiscal effect is therefore strongly influenced by the choice of discount factor (as is typical when balancing current costs with far-in-the-future benefits).

The method of financing the change in Medicaid spending also affects the change in the federal deficit. In particular, the change in Medicaid spending that comes from federal borrowing would require interest payments that offset the long-term fiscal effects of changes in the future income of child beneficiaries.

The analysis in this working paper is subject to considerable uncertainty arising from several distinct factors. First, the effect of childhood Medicaid on adult earnings is estimated from the introduction of the program and past expansions, which are imperfect guides to the effects of future policy changes. Second, the future fiscal effect will depend strongly on overall economic growth in that the fiscal payoff would be higher if labor earnings grew more quickly than expected. And third, the long gap between upfront costs and later increases in taxes (net of transfers) makes the comparisons of costs to benefits very dependent on methods of discounting future cash flows to present values. For those and other reasons, this paper provides at best a rough guide to the long-term fiscal impact of changes in Medicaid policy for children.

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[6] Although the initial increase in Medicaid spending would be counteracted by reducing noninvestment purchases, this analysis only includes effects on the primary deficit. It does not take into account secondary fiscal effects on the budget, such as future interest payments on the debt.

Description of the Model Used for This Analysis

CBO's model projects the change in federal outlays and revenues for an average child whose Medicaid enrollment would change by one year as a result of each policy.[7] CBO first forms a synthetic panel of children who would be affected by each policy in the years from 2023 to 2032. The panel resembles current Medicaid enrollees, but the distributions by age and by family income vary slightly across illustrative policies based on who CBO expects would be affected.[8] If a different policy was designed to target a particular group of children, then that feature could be incorporated into the model.[9]

The model then proceeds with the following steps:

- It projects baseline adult earnings for each affected child on the basis of his or her family income during childhood, on the estimated distribution of income mobility across generations, and on CBO's projections of the earnings distribution in future years. Those earnings are modeled for the affected children between the ages of 20 and 65.[10]

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[7] Results are presented as the average effect for a one-year change in Medicaid enrollment status for one child. However, the policies examined could change enrollment by more or less than one year, on average. For example, the continuous eligibility policy ensures that people retain Medicaid coverage for a 12-month period regardless of changes in family size or income, so the policy probably would change enrollment by less than one year, on average. As another example, version B of the block grant policy includes effects for children in utero, who are covered for less than one year (although the analysis may also include the effect from covering the mother, which can continue for 60 days postpartum).

[8] The age and family income distributions of children in the synthetic panel come from CBO's analysis of 2019 data from the Transformed Medicaid Statistical Information System. Roughly 76 percent of the synthetic panel falls into the 1st–20th family income percentiles, 23 percent into the 21st–40th percentiles, 1 percent into the 41st–55th percentiles, and 0 percent with family income above the 55th percentile (or roughly 300 percent of the federal poverty level). Between 4 percent and 8 percent of the synthetic panel falls into any one age (in utero through 18), with greater percentages in the younger ages; half the sample is age 8 or younger. In CBO's model, the age and family income distributions look slightly different for each illustrative policy. Children who would lose Medicaid enrollment resemble the 2019 distribution of Medicaid enrollees with respect to family income and age. Children who would gain enrollment resemble the 2019 distribution with respect to family income and age of part-year enrollees in 27 states and the District of Columbia without continuous Medicaid eligibility before enactment of the Consolidated Appropriations Act, 2023 (P.L. 117-328). The characteristics of the affected children under each policy, however, could differ from those of the enrollees under current law depending on the policy implementation. For example, if states respond to the block grant policy by charging copayments for children with family income higher than that of the average Medicaid enrollee, children who lost a year of enrollment would have higher average family income relative to current Medicaid enrollees. Although those types of differential take-up (enrollment) effects of the illustrative policies are not included in the current analysis, the model could be modified to include differential take-up effects of policies across age and family income distributions of affected children.

[9] For example, for the continuous eligibility policy, the estimates for children affected by the policy are based on the set of states who had not implemented that option before enactment of the Consolidated Appropriations Act, 2023. For the block grant policy, the sample includes infants and pregnant women only for version B.

[10] Given that the synthetic panel includes in utero children who are affected by the policy in 2032, the last calendar year with earnings and fiscal effects is 2098 (the year when those who are affected in utero in 2032 turn 65).

- The model then projects lifetime earnings under each policy by applying a percentage effect—positive or negative depending on whether the affected child gains or loses a year of Medicaid enrollment—to the baseline earnings of each child in the synthetic panel. CBO projects that Medicaid enrollment during childhood would have a positive effect on future earnings. The difference between each policy and the baseline is the policy's effect on earnings.[11]
- CBO projects that the policies would also change capital income. Expanded enrollment over time increases the effective units of labor (either because of more hours worked or increased productivity), which in turn increases the return to capital. Reduced enrollment has the opposite effects. The model estimates those changes per affected child, although the changes in capital income do not accrue to the affected children.
- The model then calculates the effect on the federal budget by multiplying the changes in earnings per child by CBO's projection of future marginal tax rates on labor income and by multiplying the changes in capital income by its projection of future tax rates on capital income. The fiscal effects from changes in earnings and capital income when the affected children are beyond age 65 are not considered.

A hypothetical example illustrates CBO's method. Suppose that a child projected to earn $50,000 per year as an adult under the baseline is enrolled in Medicaid for an additional year. If the earnings effect was 0.5 percent, then the child would earn $50,250 as an adult under the policy—a change of $250 per year relative to the baseline amount. If the projected marginal tax rate (net of transfers) on labor income was 40 percent for all future years, then that earnings increase would lower federal deficits by $100 (40 percent of $250) for each year that the child is projected to be in the labor force. If the effect on capital income was half that of the labor income effect and if the projected marginal tax rate on capital income was 10 percent, then there would be an additional change of $12.5 in taxes. The fiscal effect from the policy for that child would then be $12.5 per year for each year with projected earnings.

As a final step, the model converts its estimates of income and fiscal (tax-net-of-transfers) effects to present-value dollars. Those present-value calculations use two discount factors—U.S. Treasury rate discount factors and, separately, fair-value discount factors that incorporate market risk. Market risk arises because future fiscal effects will be highest when overall income levels are high (and vice versa), meaning that the investment tends to return more in good times than in bad. Reported results are averages across all children in the synthetic panel for a one-year change in Medicaid enrollment.

[11] CBO expects that the policies would also change noncash labor income, such as pension benefits. However, because most benefits are not taxed, the model does not incorporate fiscal effects from a change in that income.

Future Earnings Under the Baseline

CBO first projects the earnings of affected children without any policy change. The synthetic panel of affected children is constructed to mimic the distributions by age and family income of children enrolled in Medicaid as of 2019. Next, the model uses data on intergenerational income mobility to project the income of affected children at age 30.

CBO then uses income at age 30 to predict baseline earnings in every year from ages 20 to 65, adjusting for age and mortality. Those earnings are consistent with CBO's projections of overall economic growth and the distribution of earnings. (See Appendix A for details.)

Future Earnings Effects

To project future earnings *under the policies*, CBO multiplies baseline earnings by an earnings effect, which is the percentage change in earnings attributed to one year of enrollment in Medicaid during childhood. The estimated earnings effect—based on CBO's review of the literature about Medicaid expansion—is positive or negative depending on whether a child is enrolled or disenrolled in Medicaid (see Appendix B for details). CBO's estimated earnings effects vary by the age of the child and by family income, but the basic idea is this: A one-year change in the duration of Medicaid enrollment alters future earnings by a fixed percentage over a person's life cycle, typically about 0.5 percent. For example, if a person is projected to earn $1 million during their career, then the effect of enrolling in Medicaid for one additional year during childhood on their earnings as an adult would be $5,000. That earnings increase could come about because of increases in the probability of working, increases in hours worked, or increases in wages per hour worked.[12]

CBO estimates earnings effects based on two groups of studies: those with direct estimates and those with indirect estimates. The first group of studies estimates the effect of Medicaid eligibility during the prenatal period and childhood on earnings in adulthood. Those studies compare the earnings in adulthood of children who did and did not gain eligibility during the Medicaid rollout in the 1960s or the program's expansion in the 1980s. Based on the findings of those studies, CBO assesses that the addition (subtraction) of one year of Medicaid eligibility during childhood increased (decreased) earnings in adulthood by roughly 1.5 percent.

As a check, CBO also calculates an indirect estimate of the earnings effect by examining various channels through which Medicaid during the prenatal period and childhood could affect earnings in adulthood. In particular, CBO reviews the estimates of Medicaid's effect on intermediate outcomes—birth weight, chronic health conditions in adulthood, and educational attainment—and then multiplies each effect by an estimated effect of the intermediate outcomes on earnings in adulthood found in another strand of literature. CBO then sums the earnings effects from those different channels. In CBO's estimation, an additional year of Medicaid eligibility from in utero

[12] In this paper, the changes in labor earnings were modeled as changes in total factor productivity.

through age 18 increases earnings by roughly an average of 0.5 percent through the health and education channels, which is about one-third of the earnings effect of the direct estimates discussed above.

CBO combines the estimates from the two approaches by taking an average because both approaches have limitations. On the one hand, a gap of a few decades in the timing between implementation of a policy and differences in earnings in adulthood could generate potential confounding factors or unobserved uncertainty. Such direct estimate studies do not empirically examine intermediate channels underlying those findings. On the other hand, the indirect estimates probably include only a subset of all the relevant channels through which Medicaid eligibility could affect future earnings.

CBO then further adjusts those estimates downward to account for ways in which the earnings effect found in prior studies could differ from the earnings effect today under the illustrative policies the agency modeled. For example, children who gained Medicaid eligibility in the 1960s and 1980s were poorer relative to today's enrollees, and children today have non-Medicaid health insurance options not available during the earlier periods, both of which would reduce the earnings effect for today. Those factors are partially offset by upward adjustments to account for studies looking at a change in Medicaid eligibility instead of enrollment and because of changes in the quality of treatment since the prior studies were conducted. (For more details on limitations of the studies' applicability to the present, see Appendix B.)

Based on existing evidence, CBO models earnings effects separately for children at different ages and with different levels of family income while keeping the overall average consistent with the literature. The earnings effects decrease with the child's age of enrollment and family income (see Table 1). For example, one additional year of Medicaid enrollment increases average earnings by 0.62 percent among 1- to 11-year-olds from families with income in the 1st to 20th percentiles but by 0.05 percent among 12- to 18-year-olds from families with income in the 41st to 55th percentiles. Because of the slight variation in the characteristics of children affected, average earnings effects are slightly different under the two policies. On average, earnings would increase by 0.40 percent for one year of Medicaid enrollment under the continuous eligibility policy. Average earnings would decrease by 0.42 percent and 0.55 percent as a result of one year of disenrollment from Medicaid under the two versions of the block grant policy.[13]

[13] Noncash benefits typically increase with earnings, so changes in Medicaid policy would also affect noncash labor income. In CBO's assessment, that change would be about 20 percent of the earnings effect—roughly proportional to the ratio of wage to nonwage compensation in the baseline. Most of the value of that noncash compensation, particularly health insurance, is not taxed. For that reason, CBO does not consider fiscal effects resulting from a change in noncash labor income.

Table 1.

Average Earnings Effects as an Adult From One Additional Year of Medicaid Enrollment as a Child

Percent [a]

Age at Enrollment	Family Income Percentiles		
	1st-20th (Bottom quintile)	21st-40th (Second quintile)	41st-55th
In utero [b]	2.18	1.09	0.54
Infant [b]	0.79	0.40	0.20
Ages 1-11	0.62	0.31	0.15
Ages 12-18	0.20	0.10	0.05

Data source: Congressional Budget Office.

a. Percentage earnings effects are positive for the continuous eligibility policy and negative for both versions of the block grant policy.

b. In utero and infant earnings effects only apply to block grant version B.

CBO calculated differential earnings effects by age and family income based on direct and indirect estimates (see Appendix B for more details). In CBO's assessment, earnings effects monotonically decrease with each year of age and with each percentile of family income.

Effects on Capital Income

Higher earnings reflect improved labor quality that would increase returns to capital. In CBO's assessment, the change in capital income is proportional to the ratio of capital to labor income in the baseline.

That change in capital income accrues to owners of capital, who tend to differ from the people directly affected by changes in Medicaid policy. As a result, the average change in capital income presented in this paper does not reflect the average change in capital income among affected children as a result of the policy. Instead, it captures the total change in capital income in the economy as a result of one additional child being affected by the policy, on average.

Long-Term Fiscal Effects of Medicaid Spending on Children

CBO estimates how taxes on earnings, means-tested transfers, and taxes on capital income will change in adulthood because of the policy-induced change in GDP (labor and capital income) (see Table 2). CBO combines the marginal rates of taxes and means-tested transfer payments to calculate the marginal tax rates net of transfers for earnings in adulthood and then multiplies those rates by the change in earnings for each child in the synthetic panel. The result is an estimate of how Medicaid enrollment during childhood would change taxes net of transfers in

adulthood. CBO only considers fiscal effects accrued to the federal government and realized between ages 20 and 65 of the affected children's lives.[14]

Table 2.

Marginal Tax and Transfer Rates

Percent

Year	Marginal Tax Rate, Net of Transfers, on Earnings [a]			Marginal Tax Rate on Capital Income [b]
	Minimum	Median	Maximum	
2025	20.2	35.6	39.1	10.9
2035	23.8	39.4	43.6	11.2
2045	24.5	40.1	44.6	11.0
2055	25.3	40.5	45.1	11.1
…				
2095 [c]	25.3	40.5	45.1	11.1

Data source: Congressional Budget Office.

a. The marginal rates on labor income include marginal tax rates and marginal transfer rates, both of which vary across the earnings distribution. See Figure C.3 in Appendix C.

b. Marginal tax rates on capital income are constant across the earnings distribution; there is one economywide rate per year. See Figure C.4 in Appendix C.

c. All marginal tax rates are held constant after 2050.

The marginal rates of taxes net of transfers generally increase with earnings. The marginal tax rates on labor income are consistent with those in CBO's extended baseline projections and held constant thereafter.[15] Marginal income tax rates generally rise with earnings, but they fall at some points in the tails of the distribution. (See Appendix C for details.) CBO uses historical data to estimate how means-tested transfer payments change with earnings. In general, transfer payments are higher for households with lower income and fall as earnings increase.

CBO projects that capital income would also change as a result of the changes in labor quality and quantity reflected in the changes in labor income. The agency assumes that different types of capital income increase or decrease in equal proportions as a result of the illustrative policy.

[14] See the "Limitations of This Analysis" section later in the working paper for a discussion of how incorporating Social Security taxes and benefits could change the main results.

[15] For a description of how CBO projects marginal tax rates, see CBO (2019b).

Thus, the agency applies a projected economywide tax rate on capital income to the additional capital income.

Discounting

To calculate the net present value (NPV) of future fiscal effects, CBO multiplies the annual changes in federal revenues net of transfer payments by discount factors that range between zero and one. A discount factor close to one means that fiscal effects in the distant future are worth nearly as much as those in the present, and a smaller discount factor means that future fiscal effects are less valuable than those in the present.[16]

CBO uses two approaches to discount the long-term fiscal effects of childhood Medicaid.[17] The first approach is to discount expected future cash flows by the yields on Treasury securities of similar maturities, following the approach used for credit programs that is prescribed by the Federal Credit Reform Act of 1990 (FCRA).[18] The second approach, referred to as the fair-value approach, uses a higher discount rate to capture market risk, a component of financial risk linked to macroeconomic factors like productivity and employment conditions. To develop an adjustment to the discount rate for the fair-value approach, CBO applied methods from academic studies that estimate the financial value of payments based on future wages.[19] The fair-value approach results in a more comprehensive measure of fiscal effects because it incorporates market risk, and it can help policymakers make comparisons between policies involving different risks. Discounting using Treasury rates is more useful for understanding the expected effect of a policy on federal debt. The present value of fiscal effects calculated using Treasury rates represents the reduction in deficits today that would have the same long-term effect on debt as the projected fiscal effects of childhood Medicaid.

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[16] Discount factors are related to but distinct from discount rates. Discount rates are the future rate of return expected from various investments, such as Treasury securities, other bonds, and stocks. If the discount rate is p, then the discount factor t years from the present is simply $1/(1+p)^t$. Two important properties of that relationship are that for fixed t, discount factors are higher with lower discount rates, and for fixed p, discount factors are lower for higher values of t (that is, for values farther into the future).

[17] See CBO (2021d) for more information about the agency's approach to discounting.

[18] P.L. 101-508 (codified at 2 U.S.C. §661a(5)(E) (2018)).

[19] See Huggett and Kaplan (2016); Geanokoplos and Zeldes (2010); Benzoni, Collin-Dufresne, and Goldstein (2007); and Lucas and Zeldes (2006).

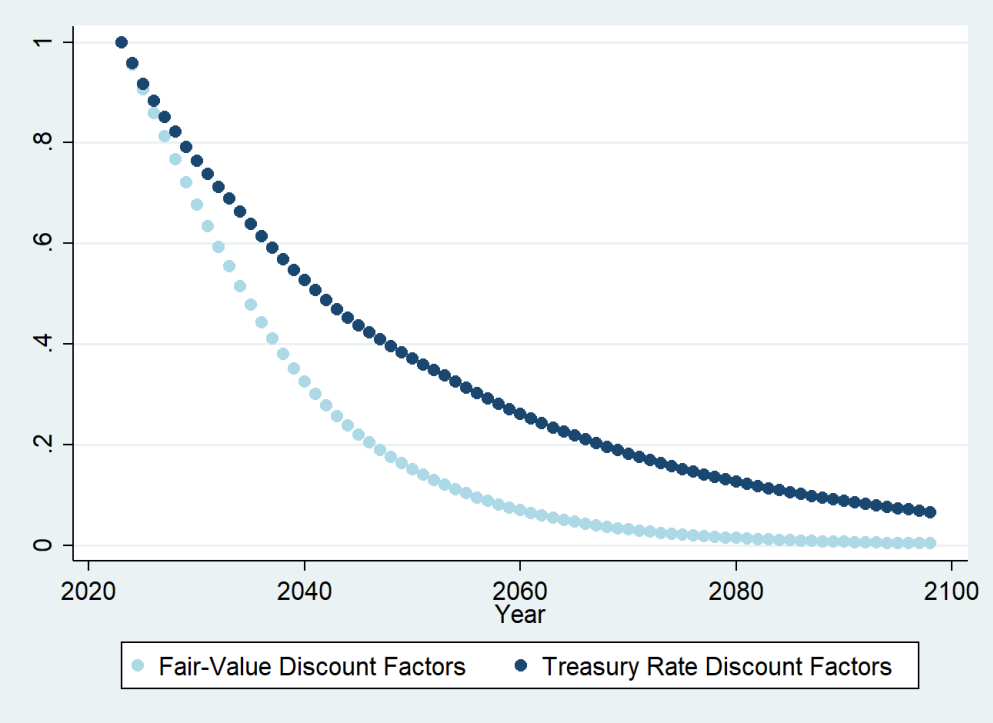
Fair-value (FV) discount factors reflect the higher rates of return that private investors would require to accept the overall risk portfolio, including the market risk embedded in fiscal effects.[20] Market risk arises because future fiscal effects will be largest when overall income levels are high, and vice versa, meaning that the investment tends to return more in good times than in bad. Private investors require higher average rates of return for investments that pay off when they least need the money. Those higher rates of return lead to lower discount factors.

Treasury rate discount factors, which reflect the cost of government borrowing, are typically higher than FV discount factors. When calculated using Treasury rate discount factors, the NPV of effects that occur in the future and those in the present differ by less than the difference using FV discount factors. For that reason, using Treasury rate discount factors tends to result in a higher NPV (relative to using FV discount factors) when a program's benefits occur later than its costs. By year 30 (or 2053), the Treasury rate discount factor is about 2.8 times greater than the FV discount factor, so the NPV of the same nominal value calculated using the Treasury rate discount factor is 2.8 times larger than that calculated using the FV discount factor (see Figure 1).

[20] In 2024, the first future year in this analysis, the Treasury discount rate is 4.4 percent, and the FV discount rate is 4.7 percent. CBO projects that Treasury discount rates and FV discount rates will tend to diverge over the next 30 years and, at that point, would be 3.7 percent and 7.3 percent, respectively. Other prior studies on the long-term budgetary effects of federal programs have used a constant discount rate of 3 percent, which was in between Treasury and FV discount rates when those studies were written (Goodman-Bacon 2021; Hendren and Sprung-Keyser 2020; Brown, Kowalski, and Lurie 2020). The Brown, Kowalski, and Lurie study justified selecting a 3 percent real discount rate by pointing to its alignment with the Department of Commerce's recommendation and its greater conservatism compared with the 0.8 percent rate proposed by the Office of Management and Budget at the time. A higher discount rate implies that the future is discounted more heavily relative to current spending or saving. For more information, see CBO (2017) and Falkenheim (2021).

Figure 1.

Discount Factors



Data source: Congressional Budget Office.

Results of the Analysis

This section presents estimates of the average long-term fiscal effects of gaining or losing one year of Medicaid enrollment during childhood. Specifically, it presents the average change per child in taxes net of transfers due to one year of Medicaid enrollment. Because these effects vary with attributes of the affected child, the average is taken across all children in CBO's synthetic panel.

Main Results

The NPV of long-term fiscal effects (the change in taxes net of means-tested transfers) of Medicaid spending on children varies by policy, and that difference is mostly driven by whether a policy would affect infants and pregnant women (see Table 3). The effects from the continuous eligibility policy and block grant version A are very close in absolute value because the distributions by age and family income among children affected vary only slightly across the two policies—in short, they both affect children ages 1 to 18. Block grant version B has bigger effects (in absolute value terms) because it applies to infants and children in utero, for whom earnings effects are larger.

Table 3.

Net Present Value of Changes per Affected Child Under Illustrative Policies [a]

Amounts, in 2023 Dollars and Rounded to the Nearest Hundred

	Using Treasury Rate Discount Factors		
	Change in Initial Federal Medicaid Outlays [b]	Change in GDP [d]	Fiscal Effects (% of the change in initial federal Medicaid outlays) [e]
Continuous Eligibility	$1,700	$14,900	$3,400 (197%)
Block Grant A	-$1,700	-$15,600	-$3,600 (206%)
Block Grant B	-$1,700 [c]	-$20,100	-$4,600 (266%)

	Using Fair-Value Discount Factors		
	Change in Initial Federal Medicaid Outlays [b]	Change in GDP [d]	Fiscal Effects (% of the change in initial federal Medicaid outlays) [e]
Continuous Eligibility	$1,700	$3,700	$800 (49%)
Block Grant A	-$1,700	-$3,900	-$900 (51%)
Block Grant B	-$1,700 [c]	-$4,500	-$1,000 (60%)

Data source: Congressional Budget Office.

a. The analysis considers two illustrative policies. The continuous eligibility policy requires that all states provide children with 12 months of continuous Medicaid eligibility, allowing them to remain enrolled regardless of changes in income or family size within the 12-month period. That policy was enacted in the Consolidated Appropriations Act, 2023 (P.L. 117-328). The block grant policy would establish block grants to states with amounts below the federal spending on Medicaid under current law, and CBO anticipates that states would respond in ways that would reduce Medicaid enrollment among children. For illustrative purposes, version A of the block grant policy would not affect enrollment of children in utero and infancy, while version B would.

b. Average projected Medicaid outlays per child per year from 2023 to 2032, rounded to the nearest hundred and discounted to 2023 dollars using Treasury rate discount factors, come from CBO's 2022 baseline projections (CBO 2022a).

c. The agency uses the same federal outlays for versions A and B of the block grant policy because of the lack of information about the cost of covering pregnant women. According to CBO's 2022 baseline projections, annual federal outlays for Medicaid coverage are projected to be $5,150 per covered adult in 2023, which is higher than the amount per covered child in 2023 (CBO 2022a). The block grant B policy includes coverage changes for pregnant women, and therefore would reduce federal outlays by more than version A. However, because CBO does not have information on the cost of Medicaid coverage for pregnant women specifically, the agency does not adjust the federal outlays in version B.

d. Changes in GDP include changes in labor income and capital income in the economy as a result of one additional child affected by the policy, on average. Capital income could increase for people not directly affected by the policy. The change in capital income is proportional to the ratio of capital to labor income in the baseline.

e. Fiscal effects refer to future changes in the budget of the federal government as a result of a policy. Those effects reflect both changes in revenues and changes in spending. The fiscal effect includes taxes on capital income and taxes on earnings, net of means-tested transfers.

GDP = gross domestic product

Given CBO's projections of marginal tax and transfer rates, the NPV of long-term fiscal effects is roughly one-quarter of the effects on GDP (including both earnings and capital income). Because taxes are typically collected when income is realized, that ratio does not depend on which discount factor is used.

Using Treasury rate discount factors, CBO estimates that the average effect on GDP would be a gain of $14,900 under the continuous eligibility policy, a loss of $15,600 under block grant version A, and a loss of $20,100 under block grant version B. The corresponding fiscal effects would be a gain of $3,400 for the continuous eligibility policy and losses of $3,600 and $4,600 under versions A and B, respectively, of the block grant policy.

Because almost all of the GDP and fiscal effects happen after the 10-year budget period, the use of FV discount factors reduces the NPV of income and fiscal effects by a factor of four. In particular, the average change in GDP would be a gain of $3,700 under the continuous eligibility policy, a loss of $3,900 under block grant version A, and a loss of $4,500 under block grant version B. The corresponding changes in federal revenues net of transfers would be a gain of $800 under continuous eligibility, a loss of $900 under block grant A, and a loss of $1,000 under block grant B.

No matter which discount factor is used to calculate income and fiscal effects, CBO uses Treasury rate discount factors to discount the initial change in Medicaid outlays because those outlays have no associated market risk. Using Treasury rate discount factors, CBO projects that the average annual cost of Medicaid over the 2022–2031 period will be $1,700 per covered child in 2023 dollars (CBO 2022a).

As a result, the NPV of long-term fiscal effects as a fraction of the NPV of the initial change in Medicaid outlays over the next 10 years varies greatly depending on the choice of discount factors. Using Treasury rate discount factors, that fraction is more than 100 percent; using FV discount factors, that fraction is only about half.

Variation by Age of Affected Children

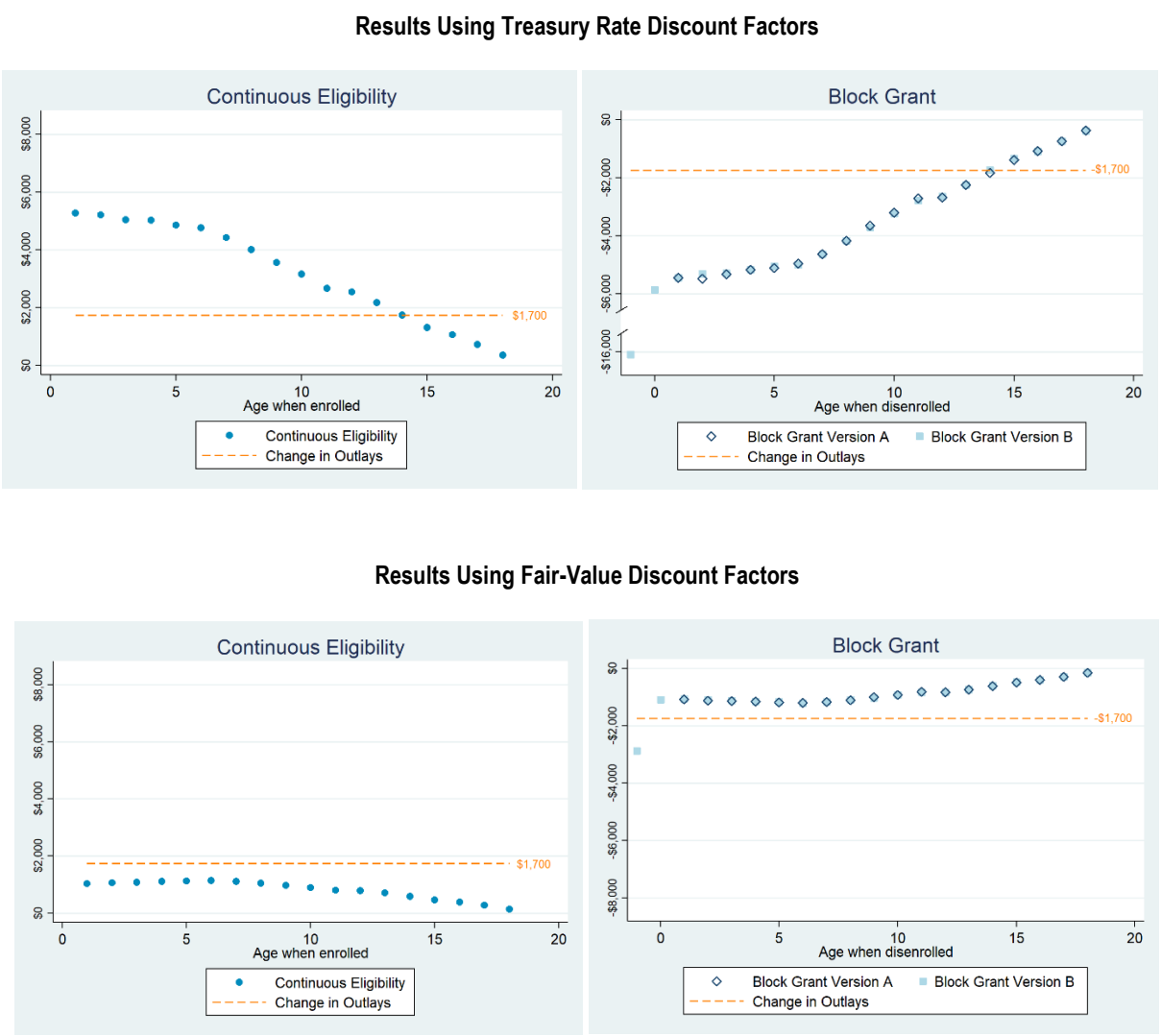
Fiscal effects associated with the policies vary with the age of the enrollee, for two reasons. First, the earnings effect is larger for children who enroll in Medicaid at younger ages, and it declines as the age of initial enrollment increases. Therefore, before discounting, the effects of Medicaid on earnings and taxes are largest for children who enroll when they are younger. Second, children who enroll in Medicaid at younger ages have a longer period before they have earnings as adults, so the effects are subject to greater discounting. The net effect, therefore, depends on how earnings effects vary by age and on the discount factors used. Using Treasury rate discount factors, CBO finds that fiscal effects generally decline with the age of the enrollee for every illustrative policy. Using FV discount factors (which discount future sums more heavily), though, CBO finds that fiscal effects increase for children up to age 6 under the continuous eligibility policy and under block grant version A and for children from ages 1 to 6 under block

grant version B; fiscal effects generally decline for children at subsequent ages. The fiscal effects by age are very similar (in absolute value terms) across the policies (see Figure 2).

Figure 2.

Net Present Value of Long-Term Fiscal Effects of Medicaid Spending per Affected Child, by Age

Present-Value Dollars



Data source: Congressional Budget Office.

Long-term fiscal effects are positive for the continuous eligibility policy and negative for both versions of the block grant policy. The dashed line represents the initial change in Medicaid outlays: an increase in the case of the continuous eligibility policy and a decrease in the case of the block grant policy.

Depending on the discount factors used, the NPV of long-term fiscal effects could be more or less than the NPV of average costs of providing Medicaid for children over the next 10 years. (CBO does not project average Medicaid costs by single year of age.) Using Treasury rate

discount factors, CBO finds that the NPV of long-term fiscal effects is greater than the NPV of average short-term costs for children affected around age 14 or younger. Using FV discount factors, CBO finds that the NPV of long-term fiscal effects is below the NPV of short-term costs for children at all ages except those disenrolled in utero under version B of the block grant policy.

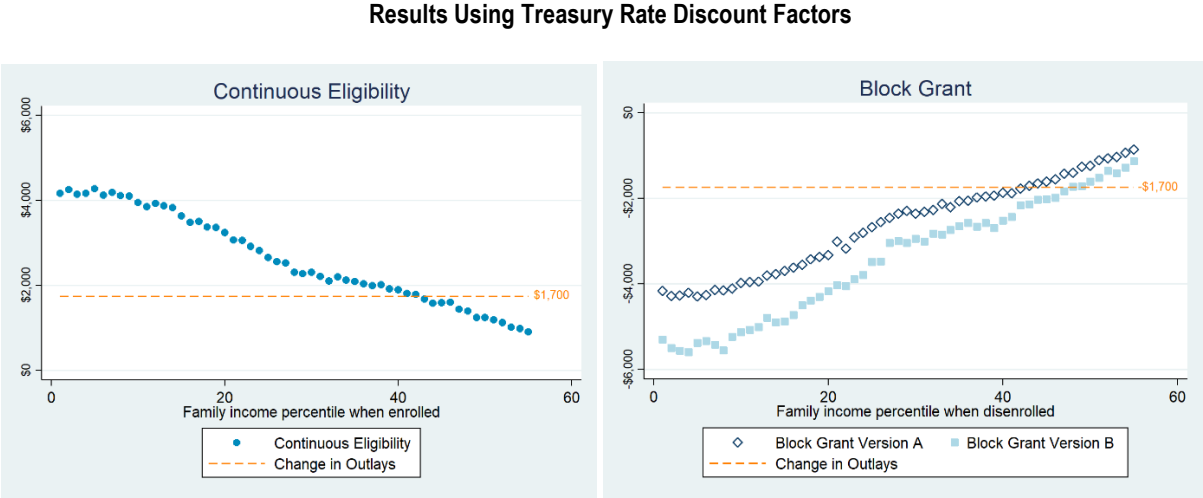
Variation by Family Income of Affected Children

The NPVs of fiscal effects vary with family income, for two reasons. First, the earnings effects are largest among children in low-income families. Second, children growing up in higher-income families have a higher baseline income, on average.[21] The second reason partially offsets the first, but on net, fiscal effects tend to decline as family income increases (see Figure 3). The NPV of long-term fiscal effects is about 3.5 times greater for children from families with the lowest decile of income than for children from families with an income in the 46th through 55th percentiles (the highest decile that qualifies for Medicaid).

Figure 3.

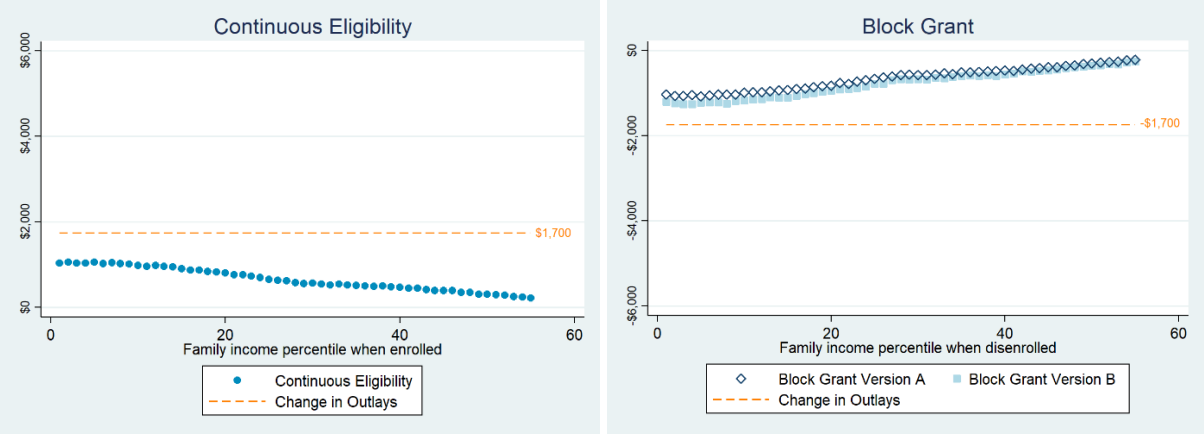
Net Present Value of Long-Term Fiscal Effects of Medicaid Spending per Affected Child, by Family Income Percentile

Present-Value Dollars



[21] As a simple example, suppose that Child A had an earnings effect of 2 percent, baseline earnings of $20,000, and, by multiplication, a $400 increase in earnings. Child B, from a higher-income family, might have an earnings effect of 1 percent, baseline earnings of $50,000, and, by multiplication, a $500 increase in earnings.

Results Using Fair-Value Discount Factors



Data source: Congressional Budget Office.

Long-term fiscal effects are positive for the continuous eligibility policy and negative for both versions of the block grant policy. The dashed line represents the initial change in Medicaid outlays: an increase in the case of the continuous eligibility policy and a decrease in the case of the block grant policy.

Depending on the discount factors used, long-term fiscal effects could exceed initial costs (in NPV terms) for children from the lower end of the family income distribution. Using Treasury rate discount factors, CBO finds that the NPV of long-term fiscal effects is greater than the NPV of average initial costs for children from families with income around or below the 42nd percentile for the continuous eligibility policy and block grant version A. Under version B of the block grant policy, long-term fiscal effects exceed initial costs for a greater portion of the family income distribution—up to the 47th percentile—because the sample includes children affected in utero and in infancy. Using FV discount factors, CBO finds that the NPV of long-term fiscal effects does not exceed the NPV of initial costs for children from families at any income percentile.

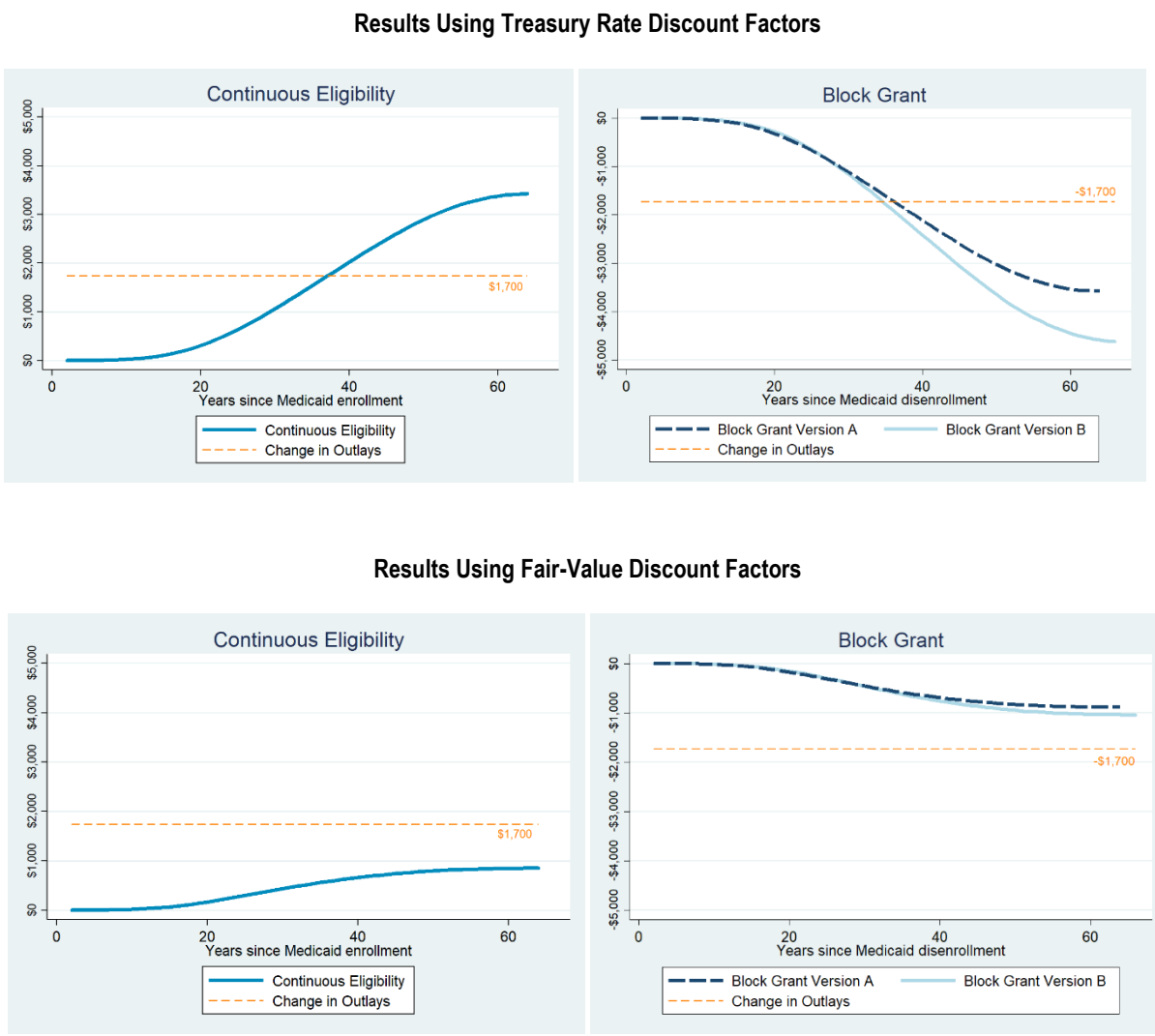
Evolution of Fiscal Effects Over Time

Although NPVs summarize streams of annual fiscal effects of Medicaid spending on children, they mask how the fiscal effects change over time. Some policymakers may want to know how long it would take after a child is enrolled or disenrolled in the program for fiscal effects to be realized at all or in full. To illustrate how fiscal effects accrue over time for the federal government, CBO examines how the NPV of the fiscal effects accumulate each year following the enrollment change (see Figure 4).

Figure 4.

Cumulative Net Present Value of Long-Term Fiscal Effects of Medicaid Spending per Affected Child Over Time

Present-Value Dollars



Data source: Congressional Budget Office.

Long-term fiscal effects are positive for the continuous eligibility policy and negative for both versions of the block grant policy. The dashed line represents the initial change in Medicaid outlays: an increase in the case of the continuous eligibility policy and a decrease in the case of the block grant policy.

Using Treasury rate discount factors, CBO finds that cumulative fiscal effects offset initial costs or savings nearly four decades after a child gains or loses Medicaid enrollment. Specifically, under the continuous eligibility policy, cumulative fiscal effects would exceed initial spending 38 years after a child gained Medicaid enrollment. Under block grant version A, the cumulative amounts of lower tax revenues and higher spending on transfers would surpass initial savings 37 years after a child lost Medicaid enrollment. Under block grant version B, the cumulative

fiscal effects would surpass initial savings after 35 years—earlier than under version A because of the higher earnings effects assumed for children affected in utero and as infants.[22]

Using FV discount factors, CBO finds that the cumulative fiscal effects would never offset initial costs or savings in NPV terms. As an affected child approached retirement, the cumulative fiscal effects would plateau, culminating at the end of the affected child's career at roughly one-half of initial costs or savings.

Budgetary Effects of Changes in Federal Borrowing

CBO estimated the budgetary effects that would occur if changes in Medicaid spending were accompanied by either more or less borrowing by the federal government—in other words, if increases in Medicaid spending were financed by increased federal borrowing or if decreases in Medicaid spending led to decreased federal borrowing (instead of shifts in resources from noninvestment spending).

Effects Under the Continuous Eligibility Policy

In general, when considering borrowing to finance spending on a policy (as opposed to changing noninvestment spending), policymakers want to know what fraction of the borrowing cost would be offset by that policy. That is, to what extent does a policy pay for itself?

In this case, the borrowing cost includes the initial spending on Medicaid and the costs from greater public borrowing crowding out funding available for private-sector investment. That crowding out would increase interest rates and lower income economywide, boosting interest costs and reducing revenues. In CBO's dynamic analysis, the total effect on the budget in present-value terms is the long-term fiscal effect of Medicaid spending minus the initial spending on the policy minus the budgetary effects resulting from crowding out.

Using Treasury Rate Discount Factors. In CBO's estimation, 44 percent of the borrowing cost of the continuous eligibility policy would be offset by the long-term fiscal effects of Medicaid spending as calculated using Treasury rate discount factors if the amounts spent on the continuous eligibility policy came entirely from borrowing by the federal government.[23] In that case, CBO estimates that the crowding-out effects would increase the federal deficit in present-

[22] That calculation reflects an assumption of equal changes in annual federal outlays per affected child for both versions of the block grant policy. However, CBO conjectures that the cost of Medicaid coverage for those in utero would be higher than that of the average child, implying larger initial savings for version B than version A (see Table 3).

[23] The continuous eligibility policy would be budget-neutral in present-value terms and accounting for dynamic effects, with 44 percent of the initial spending coming from borrowing, CBO estimates. For each $1 spent on the continuous eligibility policy (in present-value terms) coming either from borrowing or from shifts in noninvestment spending, greater earnings would boost taxes net of transfers by $1.97. For each $0.44 of borrowed funds (in present-value terms), crowding out would further increase the federal budget deficit by $1.53—thereby roughly offsetting the $1.97 from greater earnings.

value terms by roughly $6,000 per affected child, compared with outcomes if the financing occurred by shifting resources from noninvestment spending. In addition, borrowing instead of reducing noninvestment spending would increase the federal deficit by $1,700 per child.

Using Fair-Value Discount Factors. In CBO's estimation, 29 percent of the borrowing cost of the continuous eligibility policy would be offset by the long-term fiscal effect of Medicaid spending as calculated using fair-value discount factors if the amounts spent on the continuous eligibility policy came entirely from borrowing by the federal government.[24] In that case, CBO estimates that the crowding-out effects would increase the federal deficit in present-value terms by roughly $1,100 per affected child, compared with outcomes if the financing occurred by shifting resources from noninvestment spending. In addition, borrowing instead of reducing noninvestment spending would increase the federal deficit by $1,700 per child.

Effects Under the Block Grant Policy

The opposite effects would occur if Medicaid coverage was decreased by implementing either version of the block grant policy. About half of the savings from reduced borrowing in block grant version A would be offset by the long-term fiscal effect of Medicaid spending using Treasury rate discount factors. About three-fifths of the savings from block grant version B would be offset by the long-term fiscal effect of Medicaid spending using Treasury rate discount factors. That fraction would be about one-third for both versions A and B of the block grant policy using fair-value discount factors.

Methods

CBO used its policy growth model to estimate the effects of crowding out (CBO 2021c). The effects of changes in Medicaid coverage on labor earnings were modeled as changes in labor quality.[25] Economywide tax rates were applied to changes in income stemming from changes in investment resulting from crowding out.

Uncertainty

CBO's projections of fiscal effects are uncertain. One key source of uncertainty arises from the size of the percentage earnings effect and the projected growth rate of earnings. Other key sources of uncertainty in this analysis are future policy decisions and the path of interest rates, which determine future discount factors.

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[24] For each $1 spent on the policy (in present-value terms) coming either from borrowing or from shifts in noninvestment spending, greater earnings would boost taxes net of transfers by $0.49. For each $0.29 in borrowed funds (in present-value terms), crowding out would further increase the federal budget deficit by $0.19—thereby roughly offsetting the $0.49 from greater earnings.

[25] The results are similar if they are modeled as changes in labor supply instead of changes in total factor productivity.

Earnings Effects

CBO's estimate of the earnings effect is a combination of direct and indirect estimates, both of which are uncertain. In the literature, the direct estimates are larger than those implied through observed intermediate channels. (See Appendix B for how CBO combined different estimates from the literature.) Both direct and indirect estimates are based on policy changes that took place several decades ago. The corresponding effects for future policies will probably differ because of subsequent changes in health care, health insurance, and the labor market, but quantifying how those differences would affect future earnings from childhood enrollment or disenrollment in Medicaid is uncertain.

Although the indirect estimates of the earnings effect account for several important intermediate channels through which Medicaid receipt during childhood affects future earnings, they may omit other channels. The associations between the intermediate outcomes and future earnings are imprecise, and there is considerable uncertainty about how to combine multiple indirect estimates into a single parameter.[26]

In addition to the uncertainty around the direct and indirect estimates of the earnings effects, there is uncertainty about how to combine them. An approach that put more weight on the direct estimates would yield a higher earnings effect, whereas an approach that put more weight on the indirect estimates would yield a lower one.[27]

Even though the earnings effects are uncertain, any change to their values would have a proportional effect on the NPV of long-term fiscal effects because the earnings effects are applied as a percentage to annual projected earnings for adults between ages 20 and 65. If CBO doubled its percentage earnings effect, for example, then the effects on GDP and taxes net of transfers would be about twice those reported in Table 3. Halving the earnings effect would have the opposite impact.

Heterogeneity in Earnings Effects

CBO's view that earnings effects vary by age of enrollment and family income is based on limited empirical evidence. The size of those gradients has little effect on the overall estimates of long-term fiscal effects relative to other model parameters, however.

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[26] See Athey and others (2019) for a discussion of combining short-term channels when estimating the impact on longer-run outcomes.

[27] The indirect estimates can explain about one-third of the earnings effect of the direct estimates, mainly because the indirect estimates include only a subset of all the relevant channels through which Medicaid eligibility could affect earnings. CBO combines the estimates from the two approaches by taking an average because both approaches have limitations. Additional research in that area would be helpful, and CBO may incorporate new evidence as it becomes available. See Appendix B for a more detailed discussion of the various sources of uncertainty CBO considered when combining direct and indirect estimates.

CBO models Medicaid as having a fixed percentage effect on earnings throughout one's career. That modeling choice was made because the existing literature did not show differential impacts on earnings at different points during a person's life cycle, but that choice is subject to uncertainty.

Future Labor Market Conditions

The agency's estimated earnings and fiscal effects depend on its projection of future adult earnings, which are uncertain. Since the earnings effects are applied as a percentage to earnings in each year, any change in earnings would lead to a proportional change in the fiscal effect in that particular year.

Future Policy Decisions

Projecting revenues far into the future is a source of uncertainty in this work. In its baseline projections, CBO is required to estimate income and payroll taxes as under current law.[28] From 2023 to 2033, though, there are scheduled changes to a large number of tax provisions that will result in higher statutory tax rates after 2025. As a result of that and other changes, tax revenues and marginal tax rates will be higher after 2025. Additionally, tax revenues and marginal tax rates slowly increase over time because the tax system is only partially indexed for inflation. As a result, as income grows faster than the indexing in the tax system, more income is pushed into higher tax brackets (a process known as real bracket creep).

CBO's extended baseline projections generally reflect the assumption that current laws will remain in place for 30 years (CBO 2022b). Under current law, real bracket creep increases marginal tax rates by about 1.0 percentage point per decade, resulting in ever increasing revenues relative to the size of the economy. That upward trend in revenues does not align with historical experience, however. Largely because of legislated changes, federal revenues have fluctuated around their 50-year average of 17.3 percent over the past five decades and have followed no apparent long-term trend (CBO 2022a). In addition, the agency does not regularly project tax rates beyond 30 years.

The main results in this analysis hold tax rates by earnings percentile constant after 2050. For completeness, though, CBO also modeled the effects of both policy changes using different tax rates. In the first alternative, the agency projected that marginal tax rates would continue to grow beyond 2050 at a rate equal to the average over the last 10 years of the extended baseline period.[29] In the second alternative, the agency held tax rates constant after 2026, when certain tax

[28] This analysis uses CBO's May 2022 baseline projections, which reflect current law as of April 2022 (CBO 2022a).

[29] Although that scenario would be consistent with extending current law beyond the 30-year extended baseline period, it results in higher effective taxes owing to real bracket creep. As a result of that bracket creep, effective tax rates would rise above the rates that have been observed historically.

provisions expire. In both alternative scenarios, projected transfers are constant by earnings percentile.

In the first alternative, tax rates are higher than in the estimates presented earlier. Therefore, the absolute values of the fiscal effects are about 2 percent to 4 percent larger (depending on the policy and discount factors) than those reported in Table 3. In the second alternative, tax rates are lower than in the estimates presented earlier. Therefore, the absolute values of the fiscal effects are about 4 percent smaller than those reported in Table 3. In either case, the fiscal effects are still more than 100 percent of outlays using Treasury rate discount factors and about half of outlays using fair-value discount factors. As with the estimates presented earlier, including pregnant women and infants increases those estimates in absolute value terms.

Limitations of This Analysis

One limitation of this analysis is that CBO's model considers the effects on future income and taxes net of transfers only for people through age 65. It therefore ignores the effects on taxes paid and benefits received for people past that age, particularly the receipt of benefits through Social Security and Medicare. Because those benefits are paid out far in the future, the net impact of including people at older ages would depend greatly on the discount factor used for the analysis.

Including Medicare or Social Security benefits would probably have a modest effect on the results. Medicare benefits are not linked to past earnings, so changes in earnings would not affect the cost of those benefits. In contrast, Social Security benefits are calculated on the basis of past earnings, so including those benefits would change CBO's calculations of budgetary effects. If payroll taxes were also excluded, the estimated fiscal effects of childhood receipt of Medicaid would still be more than 100 percent of outlays using Treasury rate discount factors and about 40 percent of outlays using fair-value discount factors. As a share of the initial change in Medicaid spending, the fiscal effects after excluding payroll taxes would be lowered by 31 percentage points to 42 percentage points using Treasury rate discount factors and by 8 percentage points to 10 percentage points using FV discount factors, relative to the numbers in Table 3.

A second limitation is that this analysis only considers the long-term benefits and costs resulting from the policies' impact on earnings in adulthood. The policies, however, could have impacts on the federal budget through other channels. Considering any other channels, either in this analysis or in a conventional cost estimate, would require a substantial body of evidence and, particularly in the case of a conventional cost estimate, an ability to estimate the size of those effects within the 10-year budget period. Those channels could include the following:

- **Health Status**. Improvements in people's health status could reduce federal spending on health care. If people lived longer, though, spending on health care and Social Security could increase.

- **Education.** Medicaid enrollment could boost enrollment in postsecondary school by improving children's health or by increasing available family resources invested in children. CBO's model already accounts for the impact of more education on earnings, but increasing school enrollment could elevate the overall cost of education.
- **Justice System Involvement**. Medicaid enrollment can provide access to services that address underlying conditions, like mental health and substance use disorders, which if left untreated may contribute to criminal behavior or justice system involvement. Medicaid enrollment can also address financial instability, another factor linked to justice system involvement. Decreasing justice system involvement could reduce federal spending.[30]
- **Other Family Members.** Medicaid coverage for children could benefit their parents. For example, the mental and physical health of parents could improve because of the reduction in financial and other stresses. Those improvements could lead to a decrease in federal spending on health care. Conversely, the labor supply of parents of affected children could decline because of less reliance on employment-based health insurance. That change could lead to a reduction in tax payments.[31]

An additional limitation of the analysis is that it does not include the impact on spending or tax revenues by state or local governments or the impact on federal spending from changes in states' behaviors in response to changes in federal Medicaid spending.

- **State or Local Spending**. The federal, state, and local governments share many responsibilities in providing services. Any reduction in the use of health care, increase in education, or reduction in criminal behavior would also affect spending by state and local governments. Any change in earnings would also affect the tax receipts collected by state and local governments.
- **States' Responses**. This analysis incorporates the expectation that states would accommodate any change in Medicaid enrollment as a result of the federal policy by providing similar benefits to unaffected enrollees and newly enrolled children. However, states could adjust the per-enrollee spending on Medicaid in response to enrollment changes induced by federal policy. That adjustment could affect overall Medicaid enrollment and the long-term fiscal impact of the program.

Even though this paper has quantified the long-term effects on income of illustrative Medicaid policies, other channels could exist outside of changes in income or fiscal effects. For example,

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[30] Most federal spending on criminal justice is discretionary. As a result, any reductions in such spending would be subject to future appropriations and, therefore, would not be counted as savings to direct spending in a cost estimate.

[31] Improved labor market outcomes for affected children could also lead to improved future outcomes for their children. Because those benefits and costs would accrue in the future, the NPV of the difference between future benefits and costs would be very small.

increasing or decreasing criminal behavior impacts the quality of life in a community although it is not easily quantified as income or fiscal effects.

Conclusion

This paper models the effects that federal Medicaid spending on children has on their adult earnings and taxes net of transfers. The model is applied to two illustrative policies affecting Medicaid enrollment during childhood, but the framework is applicable to other programs that benefit children. CBO routinely considers policies with fiscal effects that occur far outside of the 10-year period used in conventional cost estimates, and the agency is expanding its capacity to assess long-term effects of those policies in addition to the effects captured within conventional cost estimates (CBO 2021a, CBO 2021b, and Herrnstadt and Dinan 2020). CBO estimates that enrollment in Medicaid during childhood increases income in adulthood, as well as taxes net of transfers, thereby offsetting some of the initial change in Medicaid outlays. Because of the long gap between outlays and revenues, CBO finds that most of those offsets will accrue beyond 10 years, and their size depends on how future revenues are discounted. Projecting the long-term budgetary effects of any policy is highly uncertain, and future research that links intermediate outcomes with long-term effects could advance CBO's work in that area.

Appendix A: How CBO Projected Earnings for Affected Children

To estimate the effects of illustrative policies on the federal budget through changes in earnings, the Congressional Budget Office must first project baseline earnings for the affected children. This appendix outlines the steps that CBO took to estimate those baseline earnings.

Income Percentiles in Childhood

CBO's model starts with a synthetic panel of children who would gain or lose one year of Medicaid enrollment during the 2023–2032 period. An equal fraction of the panel is affected in each of those years. CBO randomly assigns each child to an age and a percentile of family income such that the synthetic panel resembles the distribution of families of children enrolled in Medicaid as of 2019, with slight differences in the population that would be affected under each illustrative policy.[32] Children who would lose Medicaid enrollment resemble the distribution of Medicaid enrollees with respect to family income and age. Children who would gain enrollment resemble the distribution with respect to family income and age of part-year enrollees in states without continuous Medicaid eligibility before enactment of the Consolidated Appropriations Act, 2023 (Public Law 117-328). Each child's percentile of family income forms the basis for estimating his or her baseline earnings in adulthood.

Income Percentiles in Adulthood

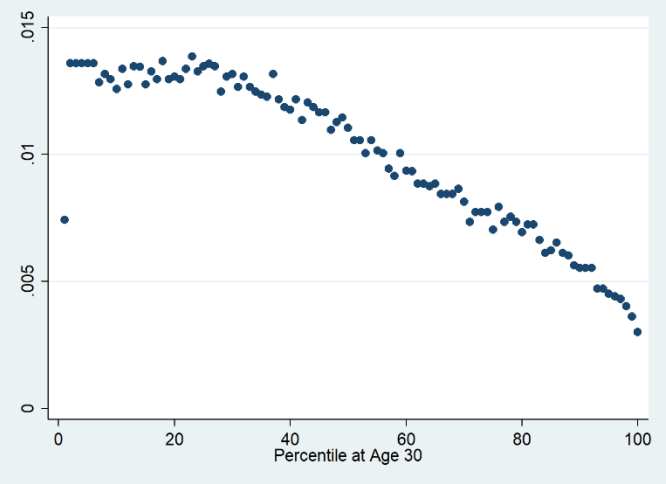
CBO uses each child's percentile of family income during childhood to predict his or her income percentile at age 30. The projections use Chetty and others' (2014) estimates of the odds that a child in a given percentile of parental income (say, the 25th percentile) will reach each percentile (1st, 2nd, 3rd, and so forth) of the age-30 income distribution (see Figure A.1). For example, a child with parental income in the 25th percentile has a 1.3 percent chance of being in the 20th percentile in earnings among 30-year-olds. Importantly, for children in the same parental income percentile in the synthetic panel, CBO randomly assigns them to percentiles of individual income at age 30 based on the results from Chetty and others (2014), which leads to a fuller representation of the earnings distribution.

[32] Due to a disenrollment freeze because of the COVID-19 public health emergency, CBO uses Medicaid enrollment data as of 2019 instead of more recent data from 2020.

Figure A.1.

Likelihood of Child's Age-30 Income Percentile, Conditional on Parent Having 25th-Percentile Income

Probability



Data source: Chetty and others (2014).

There is significant intergenerational reversion to the mean in the findings of Chetty and others (2014), meaning that children from lower-income families tend to reach higher income percentiles than their parents, on average. The mean reversion is incomplete, however, so the income of the average affected child remains below the median at age 30.

Earnings in Adulthood

CBO's process for projecting earnings in adulthood comprises several steps. First, CBO uses data from the 2020 Current Population Survey (CPS) to map income percentiles at age 30 to earnings percentiles.[33] In particular, CBO calculates the distribution of earnings percentiles within each income percentile and then randomly assigns each person in the synthetic panel an earnings percentile at age 30 from the appropriate distribution.[34] CBO uses the mapping based on the 2020 CPS for projections in all years.

[33] This analysis uses data from the CPS's Annual Social and Economic Supplement. Because the sample size for age 30 is small, the data for people ages 28 to 34 are used for the income-earnings mapping at age 30.

[34] Specifically, CBO constructed a conversion matrix between 100 income percentiles and 10 earnings deciles and then assigned children in the synthetic panel according to the probability distribution in their income percentiles. Once children were in an earnings decile, they were assigned a specific percentile based on a random uniform distribution.

Second, CBO uses the 2020 CPS to relate earnings percentiles at age 30 to those at other ages. Because earnings tend to rise with age, the net effect is to move people in the synthetic panel to higher earnings percentiles as they grow older.[35]

Third, CBO converts earnings percentiles to earnings (in future dollars) based on its projections of future earnings distributions. The median projected earnings of affected children rise over time because of aging and because of economywide growth in nominal earnings.

Further Adjustments to the Model

The assigned earnings presume that the affected children work in each year between ages 20 and 65, but the affected children might not earn in some years because they do not work or because they will have died. Thus, the model's remaining steps adjust for the probability of not working and the probability of dying.

CBO estimates those probabilities using survey data and multiplies the projected nominal earnings described above by the probability of employment and by the probability of surviving. (That is equivalent to assigning zero earnings to some affected children based on the probabilities of nonemployment and death.)

To estimate the probability of nonemployment at each age, CBO uses the 2020 CPS. CBO adjusts overall estimated rates of mortality conditional on age and earnings based on the historical relationship observed in the Survey of Income and Program Participation (see Figure A.2).[36] For instance, among individuals ages 35 to 49, someone in the bottom 20 percent has roughly double the annual mortality risk than does someone in the middle of the earnings distribution (conditional on survival to age 35), whereas someone in the top 20 percent has a roughly 50 percent lower mortality risk than someone in the middle.[37]

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[35] Each person's earnings percentile moves up or down with age based on coefficients from a regression of earnings percentiles on dummy variables for 10 age groups between 20 and 65. For instance, each person's percentile at ages 48 to 52 is increased 10 percentile points above their age-30 percentile.

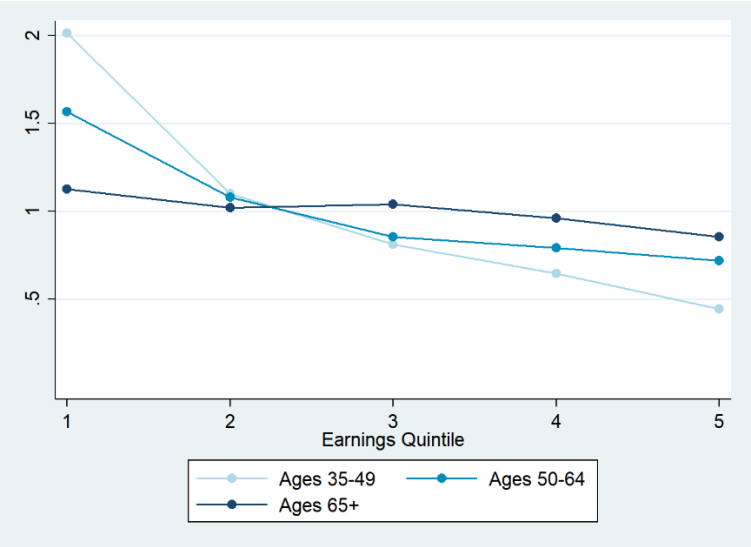
[36] Differential mortality rates by earnings are based on work by Cristia (2009) and Cristia (2007). Children in the synthetic panel have above-average mortality risk in adulthood because they have below-average earnings, so using average survival rates instead of earnings-based rates would overstate the impact of Medicaid. Other work, such as analysis by Karamcheva and Perez-Zetune (2023), adjusts mortality based on additional demographic characteristics not included in this model.

[37] This analysis does not incorporate any potential positive effect of Medicaid during childhood on affected children's mortality during adulthood, either through its effect on earnings or other channels. Changes in Medicaid enrollment during childhood could affect mortality rates during adulthood through their effects on adult earnings. However, the existing literature shows that an additional year of Medicaid eligibility in childhood increases annual earnings as an adult by roughly 1 percent, which is not enough to change one's quintile in the distribution.

Figure A.2.

Relative Mortality Risk, by Earnings Quintile, for Each Age Group

Ratio



Data sources: Congressional Budget Office; Cristia (2007). The ratio shown in the figure equals the mortality rate for people in that earnings quintile and age group divided by the mortality rate across all earnings quintiles in that age group. CBO applies the differential mortality adjustments for ages 35-49 to ages 20-49 in the model because Cristia (2007) does not estimate differential mortality ratios for those under 35.

Appendix B: Effects of Medicaid Enrollment During Childhood on Earnings in Adulthood

The Congressional Budget Office estimates the earnings effects of Medicaid during childhood by considering three sets of factors. First, CBO considers studies that draw a direct link between Medicaid receipt during childhood and earnings in adulthood. Second, CBO examines studies that relate Medicaid eligibility in childhood to intermediate outcomes, such as health and education. Finally, CBO considers the applicability of those two sets of studies and adjusts the effects estimated in the literature for this analysis.

Direct Estimates

CBO identifies three studies that examine the effects of early access to Medicaid on adult earnings.[38] Miller and Wherry (2019) found that Medicaid eligibility in utero and in infancy increased income by roughly 7.5 percent among respondents between the ages of 23 and 36. Brown, Kowalski, and Lurie (2020) found that each year of Medicaid eligibility in childhood increased young adults' earnings by roughly 0.8 percent up to age 28.[39] Those papers both study Medicaid expansions for pregnant women and children that took place in the 1980s and 1990s. Goodman-Bacon (2021) studied the introduction of Medicaid in the 1960s and found that each year of Medicaid eligibility from age 0 to age 11 was associated with a 2.6 percent increase in earnings throughout one's career.[40] Together, the findings from those studies indicate that an additional year of Medicaid eligibility from in utero through age 18 increases earnings by roughly 1.5 percent per year, on average.[41]

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[38] Miller and Wherry (2019), Brown, Kowalski, and Lurie (2020), and Goodman-Bacon (2021) used distinct measures of adult income. Specifically, Miller and Wherry (2019) and Goodman-Bacon (2021) used total personal income and earned income, respectively, from the American Community Survey, while Brown, Kowalski, and Lurie (2020) relied on wages and salaries from administrative tax data. Despite the variation in measures, CBO interprets all the findings as indicating effects on earnings, given that most of the income effects are probably driven by changes in earnings.

[39] Results from Brown, Kowalski, and Lurie (2020) show that for females, an additional year of simulated Medicaid eligibility in childhood results in an increase of $1,784 in cumulative earnings by age 28 on a base of $136,600. For males, although the coefficient is statistically insignificant, an additional year of simulated Medicaid eligibility in childhood results in an increase of $581 on a base of $161,350. For the entire population, an additional year of simulated eligibility for Medicaid during childhood results in an increase of $1,177 on a base of $149,245. Those findings, which appear in Appendix Table OA.5 in that analysis, translate into a 1.3 percent increase for females, a 0.4 percent increase for males, and a 0.8 percent increase for the entire population.

[40] That is equivalent to a 1.6 percent increase in earnings for each year of Medicaid eligibility from age 0 to age 18 (spreading out the effects across those ages using a 2.6 percent increase in earnings from eligibility between ages 0 and 11 and an effect of zero between ages 12 and 18).

[41] That 1.5 percent was calculated by averaging the estimates across in utero to age 18 from the three studies and then dividing by the number of years from in utero to age 18.

Indirect Estimates

CBO also formed indirect estimates of the earnings effect by considering the effect that childhood eligibility for Medicaid has on intermediate outcomes and the relationship between those outcomes and earnings. Specifically, CBO quantified the effect of Medicaid eligibility in childhood on health or education outcomes based on its assessment of prior literature and then linked those effects to earnings in adulthood using estimates of correlations between those intermediate outcomes and earnings. Although there are probably other channels through which Medicaid eligibility during childhood could impact earnings, the channels that examine how health and education are related to earnings are the most developed.

- Through the effects of Medicaid eligibility on health during childhood and early adulthood, CBO estimates that Medicaid eligibility in utero and infancy is associated with a 2.5 percent increase in earnings in adulthood; an additional year of Medicaid eligibility between ages 1–11 is associated with a 0.16 percent increase; and Medicaid eligibility between ages 12–18 is associated with a 0.13 percent increase in earnings.[42]
- Through the effects of Medicaid eligibility on educational attainment and enrollment, CBO estimates that Medicaid eligibility in utero and infancy is associated with a 0.33 percent increase in earnings in adulthood; Medicaid eligibility between ages 1–11 is associated with a 0.26 percent increase; and Medicaid eligibility between ages 12–18 is associated with a 0.13 percent increase in earnings.[43]

The estimated earnings effect from the indirect approach is the sum of the estimates from the health and education channels. Combining the earnings effects based on those channels, CBO estimates that an additional year of Medicaid eligibility from in utero through age 18 increases earnings by roughly 0.5 percent per year, on average.[44]

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[42] For health channels, CBO analyzed two intermediate outcomes: the incidence of low birth weight and chronic health conditions in adulthood. Currie and Gruber (1996a) find that gaining in utero eligibility for Medicaid is associated with a decrease in the rate of low birth weight. Thompson (2017), Boudreaux, Golberstein, and McAlpine (2016), and Miller and Wherry (2019) find that Medicaid eligibility in utero and during childhood is associated with a reduction in chronic health outcomes in adulthood. CBO then translates those estimates from the literature into earnings effects by linking the effect of low birth weight on earnings (Johnson and Schoeni 2011) and the effect of chronic health conditions on earnings (Chung 2014, and Meyer and Mok 2019).

[43] Brown, Kowalski, and Lurie (2020), Cohodes and others (2016), Miller and Wherry (2019), and Goodman-Bacon (2021) estimate the impact of childhood and in utero Medicaid coverage on high school completion, college enrollment, and college completion. CBO then considers what that means for likely additional years of schooling and considers the work of Bronars and Oettinger (2006), Card (2001), Card (1999), and Oreopoulos and Petronijevic (2013) to estimate the returns from those additional years of schooling.

[44] An average of roughly 0.5 percent is calculated by averaging the health and education effects across in utero to age 18, then dividing by the number of years across in utero to age 18.

Earnings Effects for Illustrative Policies

To account for changes in the policy and economic environments, CBO adjusts the earnings effects estimated on the basis of past changes in Medicaid eligibility from both direct and indirect approaches. First, CBO combines the estimated effects from both approaches because each approach has its own limitations. Next, CBO adjusts the combined estimate of earnings effects to account for differences between populations examined in the prior studies and those in the current analysis, such as the availability of alternative sources of health insurance. Lastly, based on the existing evidence, CBO estimates earnings effects separately for those with different ages and different levels of family income, while keeping the overall average consistent with the adjusted effect based on the literature.

Combining the Direct and Indirect Estimates

The indirect estimates of the earnings effect based on studies of education and health are significantly smaller than the direct estimates found in studies that directly examined the relationship between childhood Medicaid and later earnings. CBO combines the estimates from the two approaches by taking an average and assesses that the true effects would be somewhere in between those two estimates.

- Although the direct estimates use robust identification strategies, a gap of a few decades in the timing between policy implementation and differences in adult income may generate potential confounding factors or unobserved uncertainty. Such direct estimate studies do not investigate intermediate outcomes in the earlier period.
- The indirect estimates consider several important intermediate channels, but those are still a subset of the intermediate channels through which Medicaid eligibility could affect earnings.
- The indirect approach combines estimates from different strands of literature, such as the effects of Medicaid on school completion and the effects of school completion on earnings. That concatenation of results engenders additional uncertainty. Furthermore, estimates of earnings effects based on different channels also overlap to an unknown extent, making it unclear how to aggregate results across channels.[45]

[45] Some recent studies provide an econometric framework for combining studies on short-run outcomes to examine long-run outcomes. For example, Athey and others (2019) formalize the method of using earlier-in-life outcomes such as teen health or educational attainment, or surrogates, to get around the need for yet-to-occur data when examining the long-run effects of social interventions. to implement that method in the current analysis, CBO would require two types of studies: experimental evidence on the effect of Medicaid during childhood on either health or education, and observational evidence on the correlation between those same measures of health or education and subsequent earnings. Such evidence is not available.

Making Further Adjustments

The estimates of earnings effects found in prior studies may differ from the earnings effect in this analysis because of other factors. CBO considers six factors that could alter the earnings effect today, relative to estimates based on prior studies of childhood Medicaid. Some of the factors require an upward adjustment of the earnings effect estimate and some require a downward adjustment, depending on whether they cause the earnings effect to be smaller or greater than those based on prior estimates. Based on CBO's assessment of all factors, the downward adjustment is greater than the upward adjustment. In CBO's estimation, the effect that childhood Medicaid enrollment today would have on earnings in adulthood is one-half of the estimates from the literature.

Two factors suggest that today's earnings effect could be larger than those of the past.

- **Eligibility vs. Enrollment.** CBO's model considers one additional year of Medicaid *enrollment* during childhood, but the prior studies in the literature estimated the effects of an additional year of *eligibility*. Because some of the children who are eligible for Medicaid are not enrolled, CBO expects the effects of Medicaid enrollment to be higher than the estimated effects of Medicaid eligibility. However, the difference between the effects of Medicaid eligibility and enrollment is potentially limited because Medicaid eligibility may improve outcomes for unenrolled children. For example, parents may spend more on their children if they do not need to save for medical emergencies, or children's Medicaid eligibility could improve parents' peace of mind even among the unenrolled, which might subsequently benefit children's welfare. To the extent that some of the benefits from Medicaid eligibility accrue to children who are not enrolled, the difference between the effects of Medicaid eligibility and enrollment would be mitigated.
- **Changes in Quality of Treatment.** All three studies that directly estimate the effect that childhood Medicaid has on earnings examine the Medicaid program's introduction in the 1960s or expansions in the 1980s and 1990s. Because of advancements in medicine over the past few decades, people receive more effective medical care today than they did 40 to 60 years ago, suggesting that Medicaid during childhood may boost earnings more today than it did in earlier periods (Singh and Yu 2019). For example, life expectancy at birth has increased from 69.7 years in 1960 to 73.7 years in 1980 and 78.6 years in 2017 (Arias and Xu 2017), and some of the gain in life expectancy is from substantial decreases in infant mortality (Institute of Medicine 2003).

Four other factors suggest that today's earnings effect could be smaller than in the past.

- **Health Care Infrastructure.** Earlier interventions might include channels not applicable to the current interventions. For example, following a large-scale expansion of health insurance, health care providers might invest more into the infrastructure, and improved access to higher-quality care could improve adult outcomes (Chatterjee, Qi, and Werner 2021). Such

increases in investments are unlikely to happen following the illustrative policies in this analysis.

- **Family Income of Affected Children.** Earlier interventions targeted children from very low-income households, the group for whom Medicaid is likely to have the largest effects on earnings in adulthood. Because of the changes in populations targeted by Medicaid over time, more children from middle-income families would be affected by the illustrative policies considered here. CBO projects that earnings effects would be considerably smaller, on average, than in the past because the income distribution of affected children has shifted upward.
- **Improved Baseline Health.** The earnings effects today may be smaller than those in earlier periods because the baseline health of pregnant women and children is much better today than it was a few decades ago. For instance, the maternal mortality rate and infant mortality rate have improved significantly since the 1960s (Centers for Disease Control and Prevention 1999). For already healthy cohorts of children, the benefits of Medicaid could be relatively small.
- **Availability of Health Insurance for Low-Income Children.** Earnings effects associated with childhood Medicaid today may be smaller than those associated with childhood Medicaid in the past because of changes in the accessibility of health insurance besides Medicaid over the past several decades. In particular, the advent of the Children's Health Insurance Program (CHIP) and the health insurance marketplaces have created non-Medicaid options for health insurance that were not available to the cohorts studied in the literature. CHIP, initiated in 1997, grants federal matching funds to states to provide public health insurance to children whose family income exceeds the Medicaid income eligibility limit. In 2023, approximately 24 states provided CHIP coverage to pregnant women, and all states provided CHIP coverage to children (Kaiser Family Foundation 2023a, Kaiser Family Foundation 2023b).

  In addition, the health insurance marketplaces were introduced in 2014 to provide affordable nongroup health insurance plans to low- and moderate-income populations by providing premium tax credits for eligible people. The American Rescue Plan Act of 2021 (Public Law 117-2) and the 2022 reconciliation act (Public Law 117-169) increased premium tax credits for most currently eligible people and expanded eligibility to people with income greater than 400 percent of the federal poverty level (FPL) beginning in 2021 through the end of 2025. CBO estimates that the rates of uninsured children and pregnant women were 6 percent and 12 percent, respectively, in 2021, significantly lower than in the periods studied in the literature.[46]

[46] Those figures are based on estimates of health insurance coverage from CBO's baseline projections of federal spending and revenues under current law as of July 2021. For additional information, see CBO (2022c).

Prior studies covered periods when Medicaid was likely to be the only source of health insurance for low-income pregnant women and children. For instance, Currie and Gruber (1996a) and Currie and Gruber (1996b) found that the uninsured rates among childbearing-aged women and children targeted by eligibility changes in the 1980s and 1990s were 25.6 percent and 32 percent, respectively. Likewise, Goodman-Bacon (2018) states that less than 1 percent of children had public coverage in 1963, and most of the increase in Medicaid coverage reflects the reduction in rates of uninsured people.

One additional factor suggests that today's earnings effect could differ from the effect in the past, but the direction is uncertain.

- **Duration of Enrollment.** Although the existing studies underlying the direct effects do not track the duration of enrollment for children affected by the policy changes, many of those affected would probably enroll in Medicaid for several years during their childhood because of the comprehensive expansion of eligibility. Under CBO's illustrative policies, however, the additional duration of enrollment would probably be shorter than several years and may be even shorter than a year, especially under the continuous eligibility policy. Therefore, the earnings effects estimated in prior studies may overstate or understate earnings effects associated with children's enrollment in Medicaid today.

  Existing evidence suggests that a disruption in childhood Medicaid coverage could lead to unmet health care needs and adverse health outcomes (Government Accountability Office 2012; Buchmueller, Orzol, and Shore-Sheppard 2014; Leininger 2009; and Bindman, Chattopadhyay, and Auerback 2008). That finding implies that enrolling in Medicaid for multiple years continuously might yield greater benefits than the multiple of the benefits from one year of Medicaid enrollment. For example, the improvements in health outcomes (or earnings as an adult) for a child enrolled in Medicaid for five consecutive years could exceed the total improvements from 10 children with similar characteristics, each enrolled in Medicaid for six months. Conversely, an additional month of Medicaid coverage could have diminishing returns if a child's most important health benefits are achieved with a single doctor's visit per year.

Calculating Earnings Effects, by Age of Enrollment and Family Income

CBO also incorporates the existing evidence on the variation of earnings effects by the age of enrollment and family income when affected. Based on its review of limited empirical evidence, CBO concludes that the earnings effects are smaller for children enrolled at older ages or for children from families with higher income, consistent with the fetal origins hypothesis and the framework of human capital accumulation (Almond, Currie, and Duque 2018).

More specifically, CBO estimates the following direct estimates of earnings effects by age: 5.5 percent increase in earnings associated with Medicaid in utero, 2.0 percent in infancy, 1.7 percent per year for ages 1 to 11, and 0.4 percent per year for ages 12 to 18.[47] Likewise, CBO calculates the following indirect estimates by age: 2.1 percent in utero, 0.8 percent in infancy, 0.4 percent per year for ages 1 to 11, and 0.3 percent per year for ages 12 to 18.[48] In addition, CBO estimates that children with family income lower than 100 percent of the FPL (roughly less than the 20th percentile of family income) have earnings effects about two times the size of those with family income above 100 percent of the FPL (which is roughly between the 21st and 40th percentiles of family income).[49]

By applying the further adjustments described above while keeping the overall average within each group, CBO smooths out the earnings effects such that they vary monotonically by each age and by family income percentile (see Figure B.1).

[47] CBO estimates those direct earnings effects by age based on Miller and Wherry (2019), Brown, Kowalski, and Lurie (2020), and Goodman-Bacon (2021).

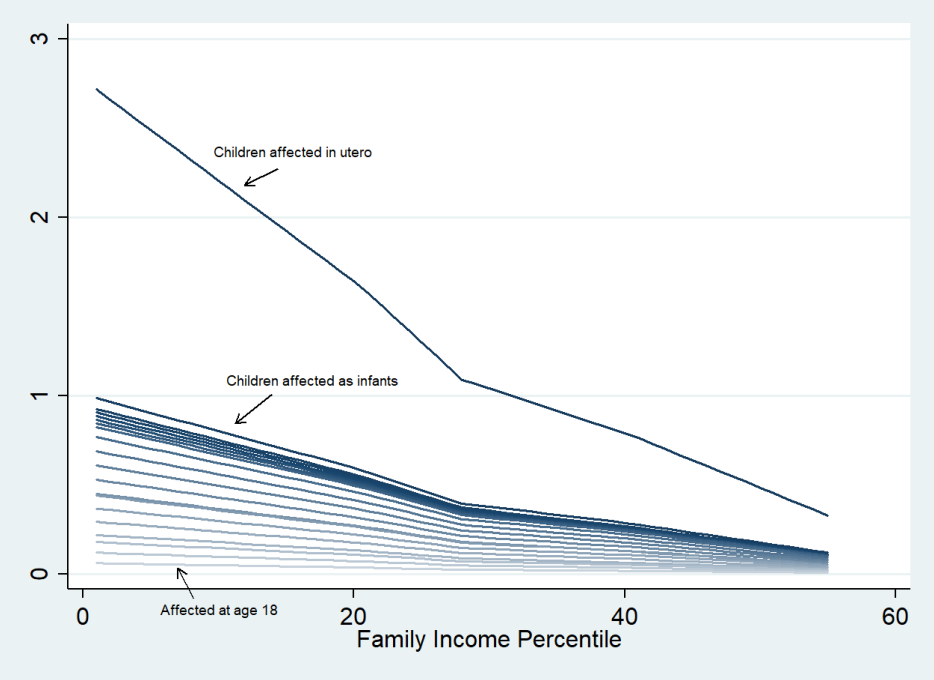
[48] CBO estimates those indirect earnings effects by age based on Currie and Gruber (1996a), Johnson and Schoeni (2011), Boudreaux, Golberstein, and McAlpine (2016), Miller and Wherry (2019), Thompson (2017), Chung (2014), and Meyer and Mok (2019).

[49] Miller and Wherry (2019) found that eligibility in utero and infancy increased earnings by 20 percent among individuals who had income below Aid to Families With Dependent Children (AFDC) eligibility thresholds or higher income with high medical expenses, referred to as the "targeted eligibility" group. That effect is more than twice the main effect of 7.5 percent, which covers both groups with income below AFDC thresholds and above 133 percent of the FPL. In CBO's assessment, children in lower family income percentiles experience larger effects than children from higher family income percentiles. Specifically, earnings effects of childhood Medicaid for those in the bottom 20 family income percentiles are about two times the size of effects for those in percentiles 21 to 40 and four times the size of effects for those in percentiles 41 to 55.

Figure B.1.

Earnings Effects, by Age and Percentile of Family Income

Percent



Data source: Congressional Budget Office.

Each line represents earnings effects for one age over percentiles of family income. Earnings effects decrease with age, so the top line represents earnings effects for children affected in utero, the next line represents earnings effects for infants, and the bottom line represents earnings effects for 18-year-olds. Effects represent the absolute value of the percentage change in earnings induced by a gain or loss of a year of Medicaid enrollment.

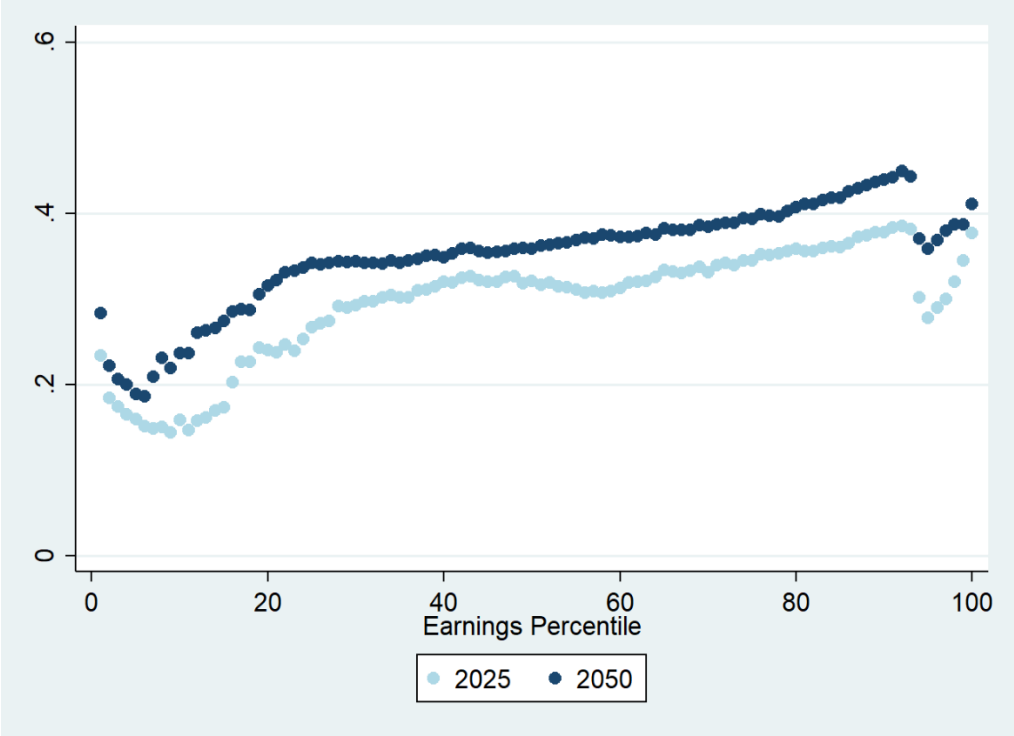
Appendix C: Projections of Marginal Rates of Taxes and Transfers

This appendix provides additional details on the marginal rates of taxes net of transfers described in the main analysis. The marginal rates include three components: taxes on labor income, means-tested transfer payments, and taxes on capital income.

First, marginal tax rates on labor income generally rise with earnings, but they fall at some points in the tails of the distribution (see Figure C.1). Those exceptions occur in part because the phaseout of certain tax credits—such as the earned income tax credit—creates higher marginal tax rates for some earners in very low percentiles and because the limit on payroll taxes lowers marginal tax rates for those at the top of the earnings distribution. Projected increases in real (inflation-adjusted) earnings lead to an upward shift in marginal tax rates between 2025 and 2050. The main results hold tax rates by earnings percentile constant after 2050.

Figure C.1.

Marginal Tax Rate on Earnings in 2025 and 2050, by Earnings Percentile



Data source: Congressional Budget Office.

Second, for marginal rates of means-tested transfer payments, the Congressional Budget Office uses historical data to estimate how those payments fall with increases in earnings (see Figure C.2).[50] In this analysis, CBO projected that means-tested transfer rates would remain constant, by earnings percentile, into the future.[51] The rates generally fall with earnings, although there are again exceptions because of programs' rules and eligibility thresholds.

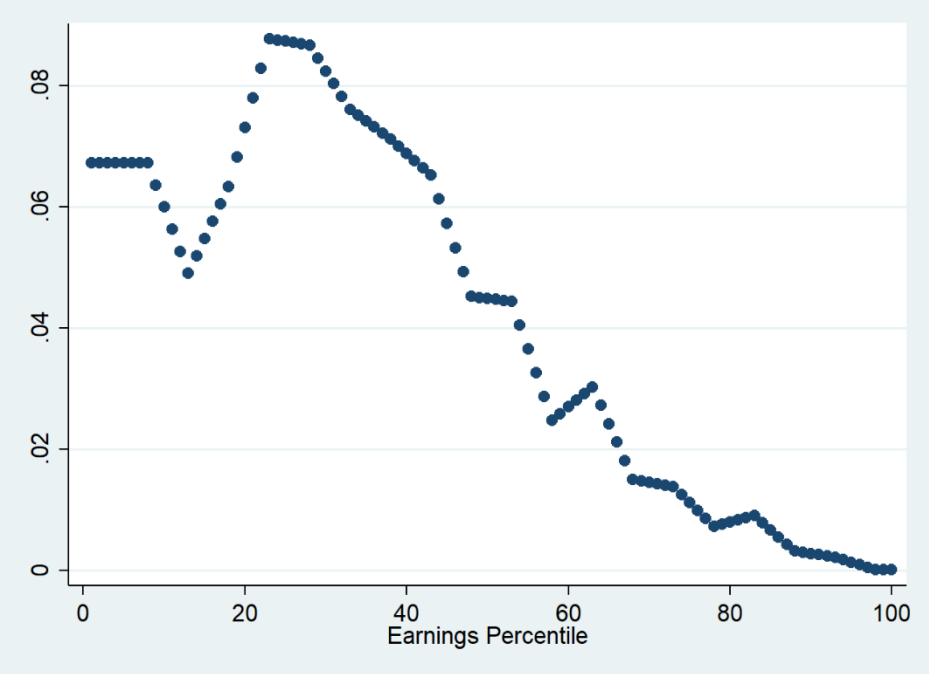
[50] For more information about the relationship between earnings and means-tested transfer payments, see Habib (2018) and CBO (2019a). CBO used 2014–2019 data from the Current Population Survey to estimate transfer payment by earnings level.

[51] CBO projects steady real growth in earnings. Holding everything else constant, CBO estimates that growth would tend to lower transfer recipiency—and transfer tax rates—in the future because the eligibility thresholds for means-tested programs are generally indexed to inflation under current law. However, CBO projects that other factors, such as changes in family structure, would offset some of the effects of rising earnings on eligibility for transfer programs, and enrollment in those programs would not fall significantly. For example, if the number of one-parent households increased, more people would be eligible for means-tested programs even if individual earnings stayed the same.

Figure C.2.

Marginal Means-Tested Transfer Rate, by Earnings Percentile

Average, 2014 to 2019



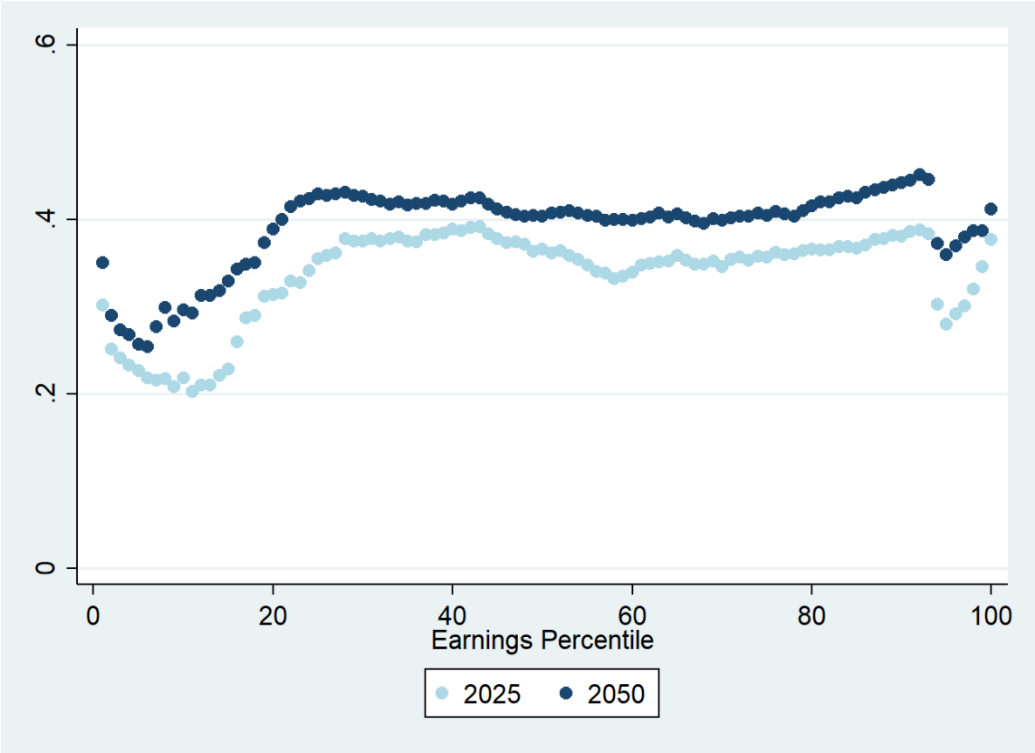
Data source: Congressional Budget Office.

The means-tested transfer programs included in this analysis are housing subsidies, Low Income Home Energy Assistance Program, Medicaid, Medicare Low Income Subsidy, the National School Lunch Program, the Supplemental Nutrition Assistance Program, Supplemental Security Income, and Temporary Assistance for Needy Families. They do not include marketplace subsidies, Medicare, or Social Security Disability Insurance. Marginal transfer rates are calculated for adults under age 65 and their children.

By combining the marginal tax rates on earnings and marginal transfer rates discussed above, CBO projects that the marginal rates applied to changes in earnings would increase over time (see Figure C.3).

Figure C.3.

Marginal Tax Rate on Labor Income, Net of Means-Tested Transfers, in 2025 and 2050, by Earnings Percentile



Data source: Congressional Budget Office.

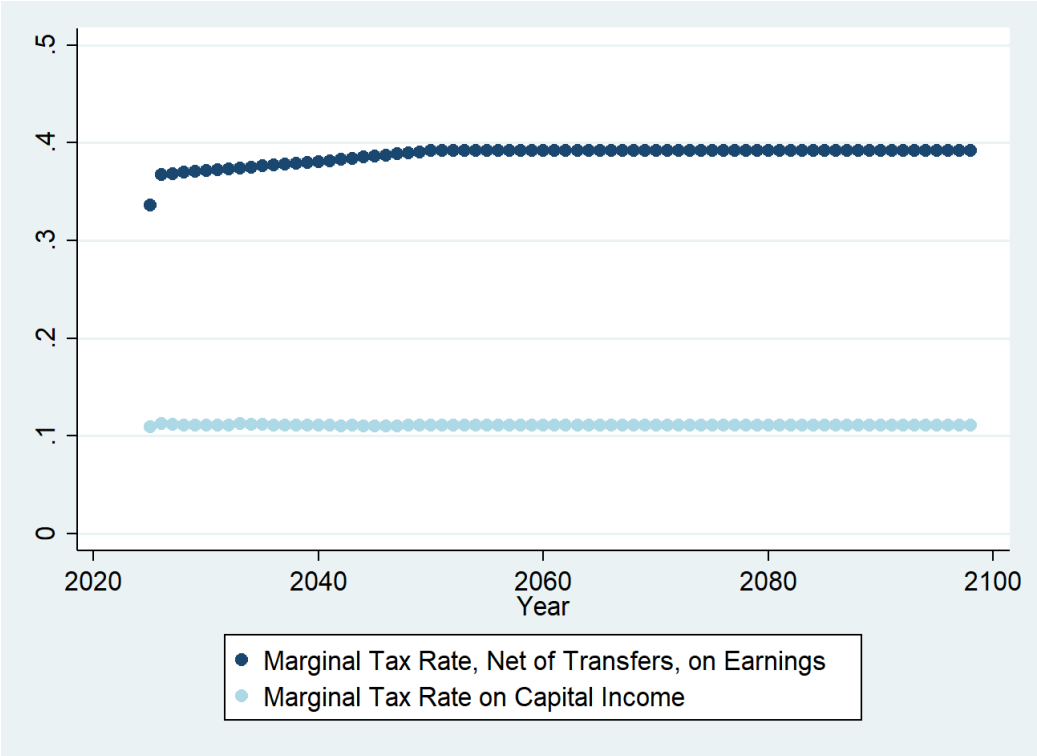
The means-tested transfer programs included in this analysis are housing subsidies, Low Income Home Energy Assistance Program, Medicaid, Medicare Low Income Subsidy, the National School Lunch Program, the Supplemental Nutrition Assistance Program, Supplemental Security Income, and Temporary Assistance for Needy Families. Marginal transfer rates are calculated for adults under age 65 and their children.

Finally, CBO projects the marginal tax rate on capital income. Unlike the marginal rates on labor income, which vary by earnings percentile, one economywide rate is applied to changes in capital income in each year. Compared with the marginal rates for labor income, the marginal tax rate on capital income remains relatively constant over time (see Figure C.4).

Figure C.4.

Marginal Tax Rates Applied to Labor and Capital Income

Rate



Data source: Congressional Budget Office.

Marginal tax rates are expected to increase between 2025 and 2026 because some provisions of the 2017 tax act are set to expire in 2026. Marginal tax rates in the figure are averages of the marginal tax rates for the whole population—in other words, all 100 earnings percentiles in that year.

References

Douglas Almond, Janet Currie, and Valentina Duque. 2018. "Childhood Circumstances and Adult Outcomes: Act II," *Journal of Economic Literature*, vol. 56, no. 4 (December 2018), pp. 1360–1446, www.jstor.org/stable/26570577.

Elizabeth Arias and Jiaquan Xu. 2017. "United States Life Tables, 2017," *National Vital Statistics Reports*, vol. 68, no.7 (June 2019), www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_07-508.pdf.

Susan Athey and others. 2019. *The Surrogate Index: Combining Short-Term Proxies to Estimate Long-Term Treatment Effects More Rapidly and Precisely*, NBER Working Paper 26463 (November 2019), www.nber.org/papers/w26463.

Luca Benzoni, Pierre Collin-Dufresne, and Robert S. Goldstein. 2007. "Portfolio Choice Over the Life-Cycle When the Stock and Labor Markets Are Cointegrated," *The Journal of Finance*, vol. 62, no. 5 (October 2007), pp. 2123–2167, https://doi.org/10.1111/j.1540-6261.2007.01271.x.

Andrew B. Bindman, Arpita Chattopadhyay, and Glenna M. Auerback. 2008. "Interruptions in Medicaid Coverage and Risk for Hospitalization for Ambulatory Care-Sensitive Conditions," *Annals of Internal Medicine*, vol. 149, no. 12 (December 2008), pp. 854–860, https://doi.org/10.7326/0003-4819-149-12-200812160-00004.

Michel H. Boudreaux, Ezra Golberstein, and Donna D. McAlpine. 2016."The Long-Term Impacts of Medicaid Exposure in Early Childhood: Evidence From the Program's Origin," *Journal of Health Economics*, vol. 45, no. 1 (January 2016), pp. 161–175, https://doi.org/10.1016/j.jhealeco.2015.11.001.

Stephen G. Bronars and Gerald S. Oettinger. 2006. "Estimates of the Return to Schooling and Ability: Evidence From Sibling Data," *Labour Economics*, vol. 13 (February 2006), pp. 19–34, https://doi.org/10.1016/j.labeco.2004.07.003.

David W. Brown, Amanda E. Kowalski, and Ithai Z. Lurie. 2020. "Long-Term Impacts of Childhood Medicaid Expansions on Outcomes in Adulthood," *Review of Economic Studies*, vol. 87, no. 2 (March 2020), https://doi.org/10.1093/restud/rdz039.

Thomas Buchmueller, Sean M. Orzol, and Lara Shore-Sheppard. 2014. "Stability of Children's Insurance Coverage and Implications for Access to Care: Evidence From the Survey of Income and Program Participation," *International Journal of Health Care Finance and Economics*, vol. 14, no. 2 (February 2014), pp. 109–126. https://doi.org/10.1007/s10754-014-9141-1.

David Card. 1999. “The Causal Effect of Education on Earnings,” in Orley Ashenfelter and D. Card, eds., *Handbook of Labor Economics* (Elsevier, 1999), p. 1801, https://doi.org/10.1016/S1573-4463(99)03011-4.

David Card. 2001. “Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems,” *Econometrica*, vol. 69, no. 5 (September 2001), pp. 1127–1160, https://doi.org/10.1111/1468-0262.00237.

Centers for Disease Control and Prevention. 1999. National Center for Chronic Disease Prevention and Health Promotion (U.S.) Division of Reproductive Health, “Healthier Mothers and Babies” (October 1999), https://stacks.cdc.gov/view/cdc/107662.

Paula Chatterjee, Mingyu Qi, and Rachel M. Werner. 2021. “Association of Medicaid Expansion With Quality in Safety-Net Hospitals,” *JAMA Internal Medicine*, vol. 181, no. 5 (2021), pp. 590–597, https://doi.org/10.1001/jamainternmed.2020.9142.

Raj Chetty and others. 2014. “Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States,” *The Quarterly Journal of Economics*, vol. 129, no. 4 (September 2014), pp. 1553–1623, https://doi.org/10.1093/qje/qju022.

YoonKyung Chung. 2014. “Chronic Health Conditions and Economic Outcomes” (paper presented at the Society of Labor Economics, Arlington, Va., May 2014), www.sole-jole.org/assets/docs/14225.pdf.

Sara R. Cohodes and others. 2016. “The Effect of Child Health Insurance Access on Schooling: Evidence From Public Insurance Expansions,” *Journal of Human Resources*, vol. 51, no. 3, (August 2016), https://doi.org/10.3368/jhr.51.3.1014-6688R1.

Congressional Budget Office. 2023. *CBO Describes Its Cost-Estimating Process* (April 2023), www.cbo.gov/publication/59003.

Congressional Budget Office. 2022a. *The Budget and Economic Outlook: 2022 to 2032* (May 2022), www.cbo.gov/publication/57950. (See www.cbo.gov/system/files/2022-05/51301-2022-05-medicaid.pdf for CBO’s 2022 Medicaid baseline projections associated with that report.)

Congressional Budget Office. 2022b. *The 2022 Long-Term Budget Outlook* (July 2022), www.cbo.gov/publication/57971.

Congressional Budget Office. 2022c. “Methods for Analyzing Health Insurance Coverage” (accessed November 3, 2022), https://go.usa.gov/xGQcM.

Congressional Budget Office. 2021a, *Effects of Physical Infrastructure Spending on the Economy and Budget Under Two Illustrative Scenarios* (August 2021), www.cbo.gov/publication/57327.

Congressional Budget Office. 2021b. *Budgetary Effects of Climate Change and Potential Legislative Responses to It* (April 2021), www.cbo.gov/publication/57019.

Congressional Budget Office. 2021c. "CBO's Policy Growth Model" (April 2021), www.cbo.gov/publication/57017.

Congressional Budget Office. 2021d. *Measuring the Cost of Government Activities That Involve Financial Risk* (March 2021), www.cbo.gov/publication/56778.

Congressional Budget Office. 2019a. *Projected Changes in the Distribution of Household Income, 2016 to 2021* (December 2019), www.cbo.gov/publication/55941.

Congressional Budget Office. 2019b. *Marginal Federal Tax Rates on Labor Income: 1962 to 2028* (January 2019), www.cbo.gov/publication/54911.

Congressional Budget Office. 2017. "Including Market Risk in Estimates of the Budgetary Effects of Changing the Federal Retirement System for Civilian Workers: Supplemental Material for *Options for Changing the Retirement System for Federal Civilian Workers*" (October 2017), www.cbo.gov/system/files/115th-congress-2017-2018/reports/53003-supplementalmaterial.pdf.

Julian P. Cristia. 2009. "Rising Mortality and Life Expectancy Differentials by Lifetime Earnings in the United States," *Journal of Health Economics*, vol. 28 (2009), pp. 984–995, https://doi.org/10.1016/j.jhealeco.2009.06.003.

Julian P. Cristia. 2007. *The Empirical Relationship Between Lifetime Earnings and Mortality*, Working Paper 2007-11 (Congressional Budget Office, August 2007), www.cbo.gov/publication/19096.

Janet Currie and Jonathan Gruber. 1996a. "Saving Babies: The Efficacy and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women," *Journal of Political Economy*, vol. 104, no. 6 (December 1996), pp. 1263–1296, www.jstor.org/stable/2138939.

Janet Currie and Jonathan Gruber. 1996b. "Health Insurance Eligibility, Utilization of Medical Care, and Child Health," *The Quarterly Journal of Economics,* vol. 111, no. 2 (May 1996), pp. 431–466, https://doi.org/10.2307/2946684.

Michael Falkenheim. 2021. *Governmental Risk Taking Under Market Imperfections*, Working Paper 2021-07 (Congressional Budget Office, June 2021), www.cbo.gov/publication/57255.

John Geanokoplos and Stephen P. Zeldes. 2010. "Market Valuation of Accrued Social Security Benefits," in Deborah Lucas, ed., *Measuring and Managing Federal Financial Risk* (University of Chicago Press, 2010), pp. 213–233, http://papers.nber.org/books/luca07-1.

Andrew Goodman-Bacon. 2018. "Public Insurance and Mortality: Evidence From Medicaid Implementation," *Journal of Political Economy*, vol. 126, no. 1 (2018), https://doi.org/10.1086/695528.

Andrew Goodman-Bacon. 2021. "The Long-Run Effects of Childhood Insurance Coverage: Medicaid Implementation, Adult Health, and Labor Market Outcomes," *American Economic Review*, vol. 111, no. 8 (August 2021), https://doi.org/10.1257/aer.20171671.

Government Accountability Office. 2012. *States Made Multiple Program Changes, and Beneficiaries Generally Reported Access Comparable to Private Insurance*, Report 13-55 (November 2012), www.gao.gov/products/gao-13-55.

Bilal Habib. 2018. *How CBO Adjusts for Survey Underreporting of Transfer Income in Its Distributional Analyses*, Working Paper 2018-07 (Congressional Budget Office, July 2018), www.cbo.gov/publication/54234.

Nathaniel Hendren and Ben Sprung-Keyser. 2020. "A Unified Welfare Analysis of Government Policies." *The Quarterly Journal of Economics*, vol. 135, no. 3 (March 2020), pp. 1209–1318, https://doi.org/10.1093/qje/qjaa006.

Evan Herrnstadt and Terry Dinan. 2020. *CBO's Projection of the Effect of Climate Change on U.S. Economic Output*, Working Paper 2020-06 (Congressional Budget Office, September 2020), www.cbo.gov/publication/56505.

Mark Huggett and Greg Kaplan. 2016. "How Large Is the Stock Component of Human Capital?" *Review of Economic Dynamics*, vol. 22 (October 2016), pp. 21–51, https://doi.org/10.1016/j.red.2016.06.002.

Institute of Medicine, Board on Health Sciences Policy, Committee on Palliative and End-of-Life Care for Children and Their Families. 2003. *When Children Die: Improving Palliative and End-of-Life Care for Children and Their Families*. National Academies Press, https://pubmed.ncbi.nlm.nih.gov/25057608/.

Rucker C. Johnson and Robert F. Schoeni. 2011. "The Influence of Early-Life Events on Human Capital, Health Status, and Labor Market Outcomes Over the Life Course," *The B.E. Journal of Economic Analysis & Policy*, vol. 11, no. 3 (September 2011), p. 2521, https://doi.org/10.2202/1935-1682.2521.

Kaiser Family Foundation. 2023a. “Medicaid and CHIP Income Eligibility Limits for Children as a Percent of the Federal Poverty Level,” *State Health Facts*, https://tinyurl.com/2srpjsrp.

Kaiser Family Foundation. 2023b. “Medicaid and CHIP Income Eligibility Limits for Pregnant Women as a Percent of the Federal Poverty Level,” *State Health Facts*, https://tinyurl.com/fn7ddth4.

Kaiser Family Foundation. 2023c. “State Adoption of 12-Month Continuous Eligibility for Children’s Medicaid and CHIP,” https://tinyurl.com/3u2vcfwu.

Nadia Karamcheva and Victoria Perez-Zetune. 2023. *Defined Benefit and Defined Contribution Plans and the Distribution of Family Wealth*, Working Paper 2023-02 (Congressional Budget Office, February 2023), www.cbo.gov/publication/58305.

Lindsey J. Leininger. 2009. “Partial-Year Insurance Coverage and the Health Care Utilization of Children,” *Medical Care Research and Review*, vol. 66, no. 1 (September 2009), pp. 49–67, https://doi.org/10.1177/1077558708324341.

Deborah Lucas and Stephen P. Zeldes, “Valuing and Hedging Defined Benefit Pension Obligations—The Role of Stocks Revisited” (preliminary draft, September 2006), http://tinyurl.com/ybqdx8rq.

Bruce D. Meyer and Wallace K.C. Mok. 2019. “Disability, Earnings, Income, and Consumption,” *Journal of Public Economics*, vol. 171 (March 2019), pp. 51–69. https://doi.org/10.1016/j.jpubeco.2018.06.011.

Sarah Miller and Laura R. Wherry. 2019. “The Long-Term Effects of Early Life Medicaid Coverage,” *Journal of Human Resources*, vol. 54, no. 3 (2019), pp. 785–824, https://doi.org/10.3368/jhr.54.3.0816.8173R1.

Philip Oreopoulos and Uros Petronijevic. 2013. “Making College Worth It: A Review of the Returns to Higher Education,” *The Future of Children*, vol. 23, no. 1 (2013), pp. 41–65, www.jstor.org/stable/23409488.

Gopal K. Singh and Stella M. Yu. 2019. “Infant Mortality in the United States, 1915–2017: Large Social Inequalities Have Persisted for Over a Century,” *International Journal of Maternal and Child Health and AIDS*, vol. 8, no. 1 (2019), pp. 19–31, https://doi.org/10.21106/ijma.271.

Owen Thompson. 2017. “The Long-Term Health Impacts of Medicaid and CHIP,” *Journal of Health Economics*, vol. 51 (2017), pp. 26–40. http://dx.doi.org/10.1016/j.jhealeco.2016.12.003.