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Social Security: Estimated Impact of Hypothetical Solvency Measures

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Social Security: Estimated Impact of Hypothetical Solvency Measures

Social Security has long been a program of high congressional interest both because of the number of people who receive benefits—now and in the future—and because of the program’s projected long-term financial imbalance. Many proposals are typically put forth in each Congress to address the program’s projected financial shortfall. Some proposals aim to achieve financial balance by reducing costs (i.e., benefit amounts), while some proposals aim to achieve financial balance by raising revenues (e.g., payroll taxes). Other proposals incorporate both cost-reducing and revenue-increasing provisions.

In its 2023 annual report, the Social Security Board of Trustees projected that under current law, Social Security’s revenues and asset reserves will be insufficient to pay full scheduled benefits after 2034. Under the trustees’ intermediate assumptions—their best estimate for the future experience—the magnitude of the changes needed to maintain Social Security solvency increases as the projected insolvency date approaches. This characteristic is attributable to the program’s rising costs and suggests that the portfolio of legislative options to achieve solvency decreases as the trust funds approach the projected depletion date. The trustees state, “Implementing changes sooner rather than later would allow more generations to share in the needed revenue increases or reductions in scheduled benefits.”

To help illustrate the magnitude of the projected financial shortfall, the trustees provided estimates for four hypothetical scenarios—each using 2023 as a starting point—that would maintain the trust funds’ solvency (i.e., the capacity to pay full benefits scheduled under current law on a timely basis):

1. **Immediate tax increase:** The trustees estimate that fulfilling all scheduled benefits payments throughout the 75-year projection period would require an “immediate” (i.e., starting in 2023) payroll tax rate increase of 3.44 percentage points. That is, the combined Social Security payroll tax rate would increase from 12.4% of covered earnings to 15.84% of covered earnings (an increase of about 28%). This would require Congress to enact legislation to change current law.
2. **Immediate benefit reduction:** If scheduled revenues were to remain as they are under current law, the trustees estimate that maintaining trust fund solvency would require an immediate (i.e., starting in 2023) benefit reduction of 21.3% applied to all current and future beneficiaries. This would require Congress to enact legislation to change current law.
3. **Delayed tax increase:** If a change in the payroll tax were to be delayed, and implemented at the time of projected trust fund depletion (i.e., effective in 2034), it would require an increase of 4.15 percentage points—an increase in the combined payroll tax rate to 16.55% of covered earnings (an increase of about 33%). This would require Congress to enact legislation to change current law.
4. **Delayed benefit reduction:** If a benefit reduction were to be implemented at the time of projected trust fund depletion (2034), benefits would need to be reduced by 25% to maintain trust fund solvency. This, however, would *not* require Congress to enact legislation to change current law.

The trustees also note that some combination of approaches could be adopted. For instance, lawmakers could propose a relatively smaller tax increase with a relatively smaller benefit reduction to achieve the same result as one of the four hypothetical scenarios listed above. The potential effects of such policy combinations are not contemplated in this report.

This report examines the potential effects of these four hypothetical changes to Social Security benefits and the payroll tax rate for a set of hypothetical earners of varying earnings levels and birth cohorts. Specifically, the report presents the changes for very low, low, medium, high, and maximum lifetime hypothetical earners—as developed by the Social Security Administration—in four birth cohorts (1960, 1980, 2000, and 2020). This analysis finds that an immediate payroll tax rate increase would have a relatively smaller impact on current beneficiaries or those close to claiming benefits, as they are less likely to be subject to the higher payroll taxes. Moreover, a delayed payroll tax rate increase would effectively *shift* a higher additional payroll tax burden onto younger cohorts. Similarly, hypothetical benefit reductions would affect workers of different birth cohorts in an unequal manner. An immediate (2023) benefit reduction would affect all current and future beneficiaries. However, under a delayed benefit reduction (e.g., 2034), many current beneficiaries would be unaffected.

Because some demographic groups are more concentrated in lower earner categories and others in higher earner categories, this analysis also suggests that the effects of certain policy changes may not be experienced uniformly by workers with different genders, races, or ethnicities.

This report does not examine alternative methods of addressing the financial shortfall such as raising or eliminating the cap on earnings subject to the payroll tax, raising the retirement age, or expanded sources of funding such as from non-wage earnings.

Contents

Introduction	1
Social Security Benefits and Payroll Taxes Under Current Law	2
Hypothetical Earners	3
Hypothetical Wages	4
Social Security Payroll Taxes	5
Scheduled Benefits	7
Hypothetical Earnings, Payroll Taxes, and Benefits Across Birth Cohorts	11
Select Measures for Hypothetical Earners Across Birth Cohorts	12
Effective Benefit Rate	12
Effective Tax Rate	13
Benefit-to-Tax Ratio	14
Scheduled Benefits and Taxes Under Current Law	14
Projected Exhaustion of the Trust Funds	15
Treatment of COLAs in Analysis of the Board of Trustees' Policy Scenarios	18
Immediate Payroll Tax Rate Increase Effective in 2023 (Scenario 1)	18
Immediate Benefit Reduction Effective in 2023 (Scenario 2)	23
Payroll Tax Rate Increase Effective in 2034 (Scenario 3)	27
Benefit Reduction Effective in 2034 (Scenario 4)	31
Comparison of the Hypothetical Scenarios	36
Conclusion	38

Figures

Figure 1. Hypothetical Earnings for the 1960 Birth Cohort by Worker Earnings Level, 1981-2026	4
Figure 2. Social Security Covered Wages and Payroll Tax Rate, 1951-2023	6
Figure 3. Hypothetical Social Security Payroll Taxes for the 1960 Birth Cohort by Worker Earnings Level, 1981-2026	7
Figure 4. Projected Hypothetical Scheduled Social Security Benefits for the 1960 Birth Cohort in Nominal Monthly Amounts by Worker Earnings Level, 2027-2046	10
Figure 5. Annual Combined Payroll Taxes by Birth Cohort and Worker Earnings Level Under Current Law and Immediate (2023) Payroll Tax Increase	20
Figure 6. Monthly Benefits by Earnings Level and Birth Cohort Under Current Law and Immediate (2023) Benefit Decrease	24
Figure 7. Annual Combined Payroll Taxes by Earnings Level and Birth Cohort Under Current Law and Delayed (2034) Payroll Tax Increase	28
Figure 8. Benefits as a Share of Scheduled Benefits, 2023-2097	32
Figure 9. Monthly Benefits by Earnings Level and Birth Cohort Under Current Law and Delayed (2034) Benefit Decrease	33

Tables

Table 1. Social Security Benefit Formula for Hypothetical Workers Born in 1960	8
--	---

Table 2. Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort Under Current Law.....	15
Table 3. Estimated Hypothetical Measures to Maintain Trust Fund Solvency Under Four Scenarios Proposed by the Social Security Board of Trustees	17
Table 4. Immediate (2023) Payroll Tax Increase: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort	22
Table 5. Immediate (2023) Benefit Reduction: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort	26
Table 6. Delayed (2034) Payroll Tax Increase: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort	30
Table 7. Delayed (2034) Benefit Reduction: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort.....	35
Table 8. Change in Benefit-to-Tax Ratios from Scheduled Amounts for Hypothetical Earners, by Birth Cohorts.....	37
Table A-1. Distribution of Average-Indexed Monthly Earnings (AIMEs) of Actual Workers Retiring in Years 2017-2022, Relative to AIMEs for Hypothetical Workers Retiring in 2022.....	40
Table A-2. Cumulative Distribution of Selected Worker Groups Relative to SSA Hypothetical Earner Profiles in 2021	42
Table A-3. Selected Characteristics of Workers in 2021 within Hypothetical Earners Categories.....	43
Table A-4. Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort Under Current Law.....	46
Table A-5. Change in Benefit-to-Tax Ratios from Scheduled Amounts for Hypothetical Workers by Earnings Levels and Birth Cohorts	47
Table A-6. Benefit-to-Tax Ratios for Workers with Various Earnings Levels.....	48
Table A-7. Delayed Payroll Tax Increase: Change and Percentage Benefit-to-Tax Ratio for Hypothetical Earners with Various Earnings Levels	49
Table A-8. Delayed Benefit Reduction: Change and Percentage Benefit-to-Tax Ratio for Hypothetical Earners with Various Earnings Levels	50

Appendixes

Appendix. Estimated Characteristics of Hypothetical Worker Profiles and Discount Rates	39
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Contacts

Author Information.....	51
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Introduction

Social Security protects insured workers and their family members against the loss of income due to old age, disability, or death. The program is composed of Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI) and is commonly referred to on a combined basis as OASDI. Most Social Security beneficiaries are retired workers. In October 2023, the 49.9 million retired workers who collected OASI benefits accounted for 74.6% of all Social Security beneficiaries.¹ Retired workers' benefits are based on their past earnings, the age when they claim benefits, and other factors.²

Social Security benefits are an important part of retired beneficiaries' financial security.³ As such, any change in the level of monthly benefits—and the program's financial ability to continue payment of benefits—is of ongoing interest to lawmakers. Under current law, Social Security's revenues and asset reserves are projected to be insufficient to pay full scheduled benefits after 2034.⁴ Under their *intermediate assumptions*, the Social Security Board of Trustees estimates that the magnitude of policy changes required to maintain Social Security solvency increases as 2034 draws near.⁵ That is, a policy change to maintain solvency (e.g., a payroll tax increase or a benefit reduction) that would take effect in 2025 would be smaller in magnitude than a similar policy change that would take effect in 2030.

To demonstrate the extent of the projected financial shortfall, the trustees estimate changes in the payroll tax rate and benefits that would be required to keep the trust funds solvent. The scenarios were presented in the 2023 annual report to illustrate the magnitude of the projected financial shortfall. The report offers four *hypothetical* scenarios that would maintain the trust funds' solvency (i.e., the capacity to pay full benefits scheduled under current law on a timely basis): (1) an immediate payroll tax rate increase, (2) an immediate benefit reduction for all beneficiaries, (3) a delayed payroll tax rate increase, and (4) a delayed benefit reduction for all beneficiaries.

¹ Another 11.1% were disabled workers. The remaining beneficiaries were spouses or children of retired or disabled workers and survivors. Social Security Administration (SSA), "Monthly Statistical Snapshot, October 2023," Table 2. See the latest edition of the Monthly Statistical Snapshot at https://www.ssa.gov/policy/docs/quickfacts/stat_snapshot/.

² Benefits that are paid to workers' dependents and survivors are also based on the earnings of the insured workers.

³ Research suggests that Social Security benefits accounted for most of the decline in poverty among the 65 and older from 1967 through 2000. For more information, see CRS Report R45791, *Poverty Among the Population Aged 65 and Older*; and CRS Report R47341, *Income for the Population Aged 65 and Older: Evidence from the Health Retirement Study (HRS)*.

⁴ Under current law, Social Security's revenues are projected to be insufficient to pay full scheduled benefits after 2034 under intermediate assumptions. SSA, Office of the Chief Actuary (OACT), *The 2023 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, March 31, 2023, <https://www.ssa.gov/OACT/TR/2023/tr2023.pdf> (hereinafter cited as 2023 Annual Report). Under current law, the OASI and DI trust funds are distinct entities and cannot borrow from each other when faced with a funding shortfall. In the past, Congress has authorized temporary interfund borrowing. As such, analysts often treat the two trust funds collectively on a hypothetical basis as the combined OASDI trust funds. For more information, see CRS Report RL33514, *Social Security: What Would Happen If the Trust Funds Ran Out?* The trustees' 2023 intermediate assumptions reflect their best understanding of the status of the Social Security trust funds at the start of 2023.

⁵ In each annual report, the trustees present three alternative sets of assumptions for demographic, economic, and program-specific factors. The *low-cost* set of assumptions represents a future experience that is the most advantageous to the program's financial status. The *high-cost* set of assumptions represents a future experience that is the least advantageous to the program's financial status. As the trustees state: "These alternatives are not intended to suggest that all parameters would be likely to differ from the intermediate values in the specified directions, but are intended to illustrate the effect of clearly defined scenarios that are, on balance, very favorable or unfavorable for the program's financial status." In actual experience, it is unlikely that all demographic, economic, and program-specific factors move in a manner that is either favorable or unfavorable to the program's financial status. Thus, the trustees use the *intermediate* set of assumptions to illustrate their best guess as to the future experience (2023 Annual Report, p. 20).

The trustees also note that a combination of approaches could be adopted.⁶ For instance, a relatively smaller immediate tax increase could be paired with a relatively smaller immediate benefit reduction to achieve the same projected solvency as one of the four hypothetical scenarios the trustees use to illustrate the magnitude of the shortfall. The potential impacts of these policy combinations are not explored in this report. Alternative methods of addressing the financial shortfall—such as raising or eliminating the cap on earnings subject to the payroll tax, raising the retirement age, or expanded sources of funding such as from non-wage income—are also not explored in this report.

Generally speaking, Social Security’s program costs are rising, which suggests that in order to maintain the trust funds’ solvency, a delayed payroll tax rate increase would need to be higher than an immediate payroll tax rate increase. Similarly, a delayed benefit reduction would need to be larger if implemented at the projected date of trust fund exhaustion than if implemented immediately.

This report examines the potential effects of the four hypothetical policy scenarios identified by the Board of Trustees for a set of hypothetical earners of varying earnings levels and birth cohorts.⁷ Specifically, the report presents the changes for very low, low, medium, high, and maximum lifetime hypothetical earners—as developed by the Social Security Administration (SSA)—in four birth cohorts: 1960, 1980, 2000, and 2020.⁸ The report first provides a brief explanation of how benefits and taxes are computed under current law. It then presents the estimated effects of the four hypothetical policy scenarios created by the Board of Trustees on effective benefit rates, effective tax rates, and benefit-to-tax ratios of different earners in the selected birth cohorts. The figures and tables included in this section highlight that delayed action scenarios (i.e., measures implemented at the projected trust fund depletion dates) concentrate the effects on younger cohorts. Finally, analysis presented in the appendix to the report considers the demographic and other characteristics of workers in various earnings categories based on the SSA hypothetical earner definitions and cross-sectional data from a large national household survey. Because some demographic groups are more concentrated in lower earner categories and others in higher earner categories, this analysis suggests that the effects of certain policy changes may not be experienced uniformly by workers of different genders, races, or ethnicities.

Social Security Benefits and Payroll Taxes Under Current Law

The Social Security benefit formula uses both worker-specific information, such as past earnings history and the age at which benefits are claimed, and birth-cohort-specific parameters (average economy-wide wages in the year a worker turns 60) to derive an individual’s monthly benefit amount. This section provides a high-level description of the benefit formula.⁹ It briefly describes

⁶ 2023 Annual Report, pp. 5-6.

⁷ 2023 Annual Report, pp. 5-6.

⁸ These cohorts were selected to highlight how the effective date of policy options would affect workers of different ages. The 1960 birth cohort will reach full retirement age (FRA)—the age at which Social Security benefits can be collected without an adjustment for early retirement—in 2027. That is, the 1960 birth cohort is close to exiting the labor force and entering retirement. The 1980 birth cohort will reach FRA in 2047. Thus, they could be considered to have worked about half of their expected time in the labor force. The 2000 birth cohort, at age 23 in 2023, is relatively new to the labor force and not relatively close to benefit collection (i.e., retirement). And the 2020 birth cohort, at age three in 2023, is still many years from entering the labor force and further still from benefit collection.

⁹ For a more detailed description of the current-law benefit formula, see CRS Report R46658, *Social Security: Benefit Calculation*.

benefit eligibility (i.e., “insured status”) conditions, the key components of the Social Security benefit formula, and the Social Security payroll tax. The effects of changes to the benefit formula components and payroll tax are illustrated in subsequent sections of the report.

Hypothetical Earners

This report presents the effects of potential changes in the benefits and payroll tax rate on a set of five *hypothetical earners*—as defined by SSA—whose career earnings range from *very low earnings* to *maximum earnings* and vary across birth cohorts. Hypothetical earners are used to illustrate how the benefit formula works and how changes to the benefit formula could affect workers of different earnings levels and different ages.

In brief, the career earnings profiles for hypothetical earners are calculated using an age-specific, scaled factor developed by SSA’s Office of the Chief Actuary (OCACT). The scaled factor conveys, for each age, an individual’s average earnings as a share of the average wage index in the year that the individual was that age.¹⁰ Earnings profiles are then calculated by birth cohort. For persons in a given cohort, estimated earnings for a given year and age are calculated as the product of the respective scaled factor and the average wage index (AWI) for that year.¹¹ These estimated earnings are then indexed to the AWI for the year in which the cohort turns 64.¹² Finally, estimated earnings are used to create four hypothetical worker profiles, such that career-average estimated earnings are 25% (*very low* hypothetical earners), 45% (*low* hypothetical earners), 100% (*medium* hypothetical earners), and 160% (*high* hypothetical earners) of the AWI in the year prior to entitlement.¹³ A fifth category of hypothetical earner (*maximum* hypothetical earner) is assumed to earn at least the taxable maximum (i.e., contribution and benefit base) in each year from age 21 to 64.¹⁴ Based on these SSA methods, hypothetical workers are assumed to have long and consistent earnings histories at their respective levels.¹⁵

¹⁰ OCACT applies additional adjustments to the scaled factor for ages 62 and older. OCACT, *Scaled Factors for Hypothetical Earnings Examples Under the 2023 Trustees Report Assumptions*, March 2023, Table 1, <https://www.ssa.gov/OACT/NOTES/ran3/an2023-3.pdf>. Scaled factors are assumed to remain consistent for all birth cohorts.

¹¹ For more information on the AWI, see CRS In Focus IF11931, *Social Security: The Average Wage Index*.

¹² Methods used in the source cited in footnote 10 to calculate indexed career-average earnings differ from those used to calculate the average indexed monthly earnings. The method used in the actuarial note indexes earnings prior to the year of entitlement rather than two years prior to eligibility as would be done under the current-law benefit formula.

¹³ The model does not assume that hypothetical workers earn a constant share of AWI in each year but that over their careers their average earnings are a particular share of AWI in the year prior to entitlement. For example, *high earners* are assumed to earn 45.4% of AWI in the year they are age 21. This rate increases over time until it peaks at 175.2% of AWI in the year they are age 48, after which it declines to 133.2% in the year they are age 62.

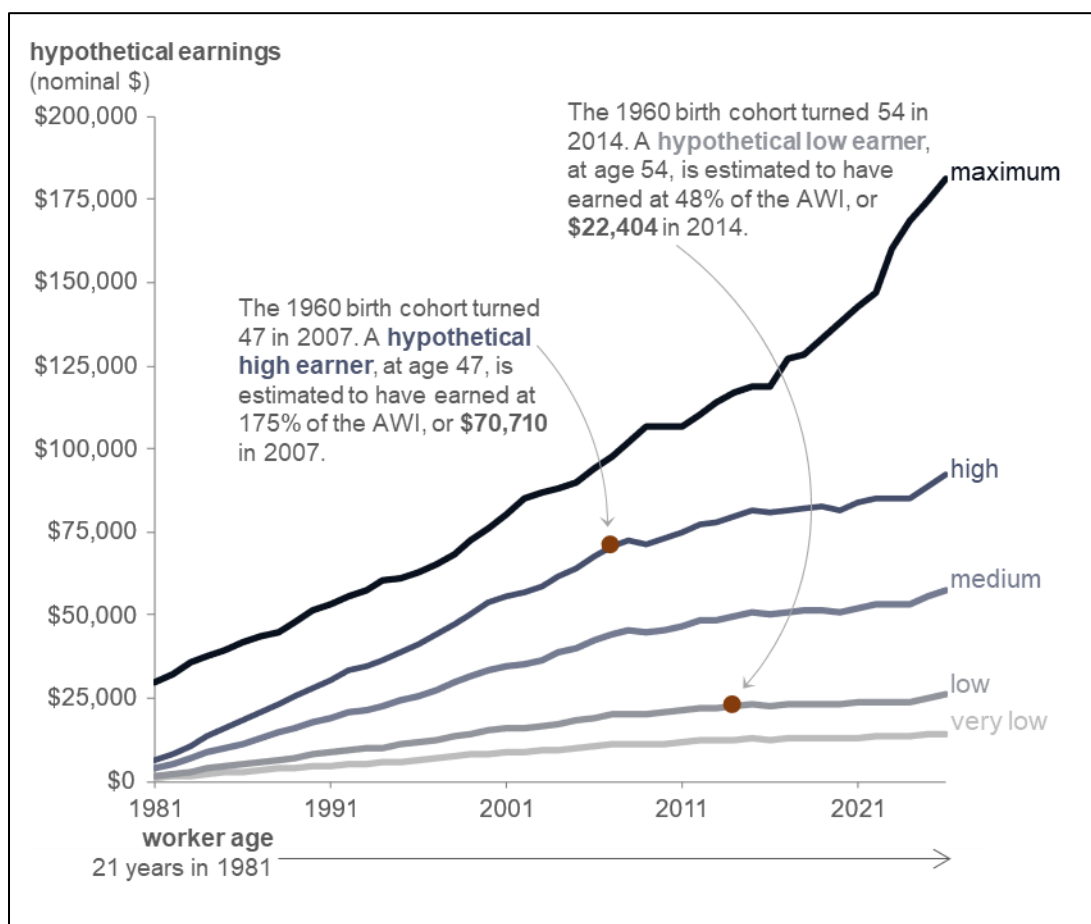
¹⁴ Scaled earnings factors are published for hypothetical workers through age 64. For this report’s analysis, hypothetical workers are assumed to earn at the same level of AWI at ages 65 and 66 as they did at age 64. While this assumption does not affect benefit computation (i.e., primary insurance amounts are calculated at age 62), it does impact earnings and total payroll taxes for hypothetical workers for ages 65 and 66. For more information, see CRS Report RL32896, *Social Security: Raising or Eliminating the Taxable Earnings Base*.

¹⁵ This assumption does not always reflect reality. One study shows that in a sample of workers born between 1926 and 1960, the average worker had 5.7 years of zero earnings within their highest 35 years of earnings. The distribution of zero earnings in this sample was highly skewed (i.e., 60% of workers had no years of zero earnings while 7% had more than 25 years of zero earnings). Women were estimated have more years of no earnings as compared to men, and years of no earnings were negatively correlated to earnings level (i.e., workers with lower earnings were estimated to experience a larger number of years of no earnings than workers with higher earnings). See Chad Newcomb, *Distribution of Zero-Earning Years by Gender, Birth Cohort, and Level of Lifetime Earnings*, SSA, <https://www.ssa.gov/policy/docs/rsnotes/rsn2000-02.html#mt2>.

Hypothetical Wages

Figure 1 shows the result of this process for the 1960 birth cohort with hypothetical low earners consistently earning relatively *low* wages throughout their careers, whereas hypothetical high earners consistently earn relatively *high* wages throughout their careers. For example, a hypothetical high earner born in 1960 would have turned 47 in 2007 and earned at about 175% of the AWI for that year, or \$70,710.¹⁶ Alternatively, the hypothetical low earner born in 1960 would have turned 54 in 2014 and earned at about 48.2% of the AWI, or \$22,404. **Figure 1** also displays the earnings level for a hypothetical *maximum* worker, which is simply the taxable maximum for that year (i.e., the annual limit on earnings subject to the Social Security payroll tax).

Figure 1. Hypothetical Earnings for the 1960 Birth Cohort by Worker Earnings Level, 1981-2026



Source: CRS using Office of the Chief Actuary (OCACT), *Scaled Factors for Hypothetical Earnings Examples Under the 2023 Trustees Report Assumptions*, March 2023, Table 1, <https://www.ssa.gov/OACT/NOTES/ran3/an2023-3.pdf>.

Notes: Hypothetical workers earn a fixed percentage of the average wage index (AWI) in each year.

¹⁶ For instance, the 1960 birth cohort was 47 in 2007. A hypothetical high earner at age 47 earns at 175.0% of AWI. The AWI in 2007 was \$40,405.58, and 175.0% of \$40,405.58 is \$70,709.77.

Social Security Payroll Taxes

Social Security is funded by a tax of 6.2% of covered wages imposed on employees and employers (12.4% combined).¹⁷ Self-employed workers pay 12.4% of their net self-employment earnings (business earnings minus all legal deductions, such as the cost of goods sold) toward Social Security as a portion of their self-employment taxes. The Social Security payroll tax applies only to wages paid up to the Social Security wage base limit for the year (\$160,200 in 2023, adjusted annually for the growth in average wages). The employee portion of the Social Security tax is directly withheld from wages paid to an employee.¹⁸ The withheld employee portion and the employer portion are deposited to the government by employers, generally monthly or semi-weekly, often when the employer processes payroll.¹⁹

Social Security payroll tax rates have largely remained the same since 1990 (outside of the 2011-2012 Social Security payroll tax holiday, provided as a temporary relief in the aftermath of the Great Recession of 2007-2009), as shown in **Figure 2**.²⁰ The recent period of constant rates follows a period of regular rate increases. The first Social Security tax was a 1% levy on employees on covered wages earned starting in 1937, with employers also paying the same amount.²¹ Combined Social Security payroll tax rates rose from 2% in 1949 to 12.4% in 1990. The last Social Security tax rate increase was part of the Social Security Amendments of 1983 (P.L. 98-21).²² **Figure 2** shows the payroll tax rate and the contribution and benefit base (CBB; i.e., taxable maximum) from 1951 to 2023.²³

¹⁷ Generally, the tax base for the Social Security payroll tax is all compensation for employment, which includes wages and the cash value of many benefits. There are several exceptions, including for employer-provided health insurance and certain employer retirement contributions. The full list of exceptions is at Title 26, Section 3121, of the *U.S. Code*. The tax applies to compensation paid to employees in “covered employment.” See above for more information about covered employment.

¹⁸ The payroll tax burden is often believed to fall on workers as the employer’s share of payroll taxes is passed on to employees in the form of lower wages. That is, while the statutory incidence is that half of the combined payroll tax is paid by the employee, research suggests that at least some of the employer-paid payroll taxes are born by workers in terms of lower wages. As discussed later, the analysis of this report assumes a worker bears the full burden of the payroll tax rate. See “Distribution of Payroll Tax Burden” in CRS Report R47062, *Payroll Taxes: An Overview of Taxes Imposed and Past Payroll Tax Relief*; and Congressional Budget Office (CBO), *Revisiting the Extent to Which Payroll Taxes Are Passed Through to Employees*, <https://www.cbo.gov/system/files/2021-06/57089-Payroll-Taxes.pdf>.

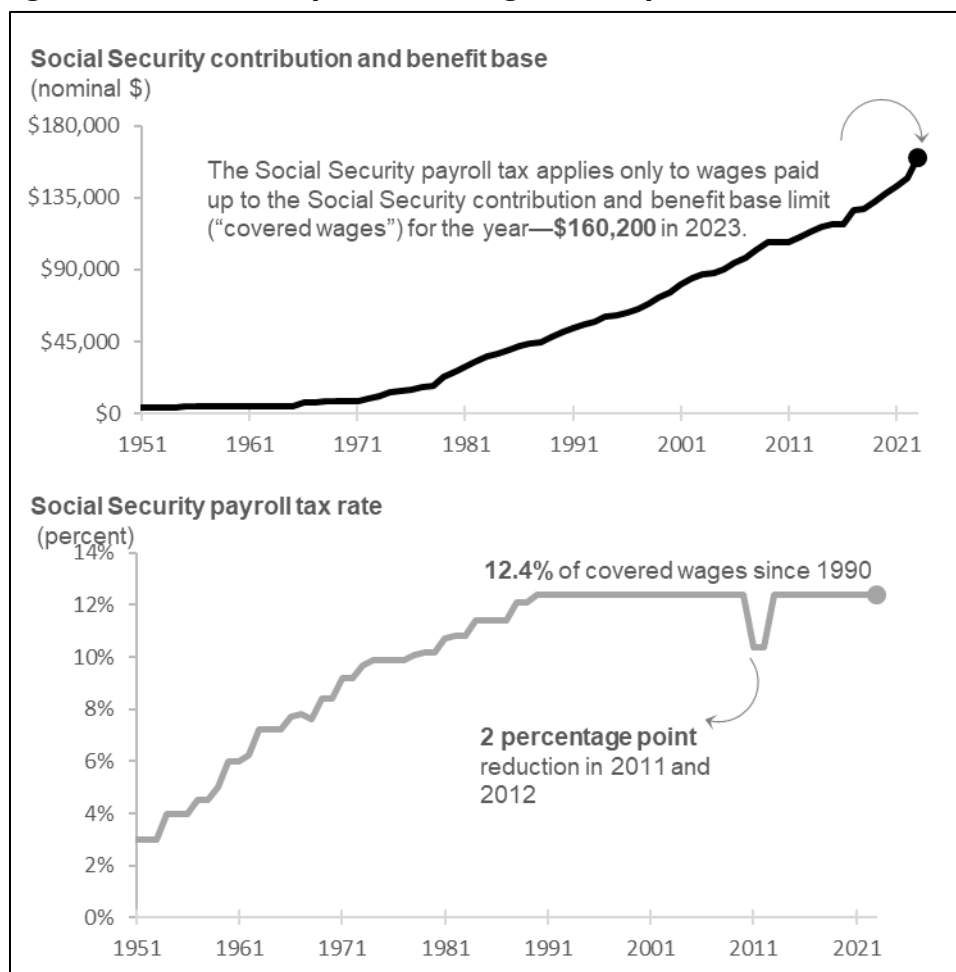
¹⁹ Semi-weekly deposits are generally made every two weeks. See 26 C.F.R. §31.6302-1.

²⁰ The payroll tax holiday included a transfer of funds from general revenue to the Social Security trust funds. For more information, see “Employee Payroll Tax Holiday” in CRS Report R47062, *Payroll Taxes: An Overview of Taxes Imposed and Past Payroll Tax Relief*.

²¹ The Federal Insurance Contributions Act (26 U.S.C. §§3101 et seq.) moved the tax provisions to the Internal Revenue Code in 1954 and prescribed further increases. See CRS Report R42035, *Social Security Primer*.

²² The Social Security Amendments of 1977 (P.L. 95-216) established the 6.2% payroll tax rate for employees and employers for 1990 and later. The 1983 amendments accelerated gradual tax increases scheduled under the 1977 amendments and increased the self-employment tax rate to twice that of the employee/employer rate. See <https://www.govinfo.gov/content/pkg/STATUTE-91/pdf/STATUTE-91-Pg1509.pdf#page=3>.

²³ Automatic indexation of the CBB to growth in the AWI was established as part of the 1972 Amendments to the Social Security Act (P.L. 92-336), effective in 1975, at the same time automatic cost-of-living adjustments (COLAs) were established. Prior to 1975, increases in the CBB were legislated on an ad hoc basis. See CRS Report RL32896, *Social Security: Raising or Eliminating the Taxable Earnings Base*.

Figure 2. Social Security Covered Wages and Payroll Tax Rate, 1951-2023

Source: Figure created by CRS using data from Social Security Administration (SSA), "Social Security and Medicare Tax Rates," <https://www.ssa.gov/oact/progdata/taxRates.html> and <https://www.ssa.gov/OACT/COLA/cbb.html>

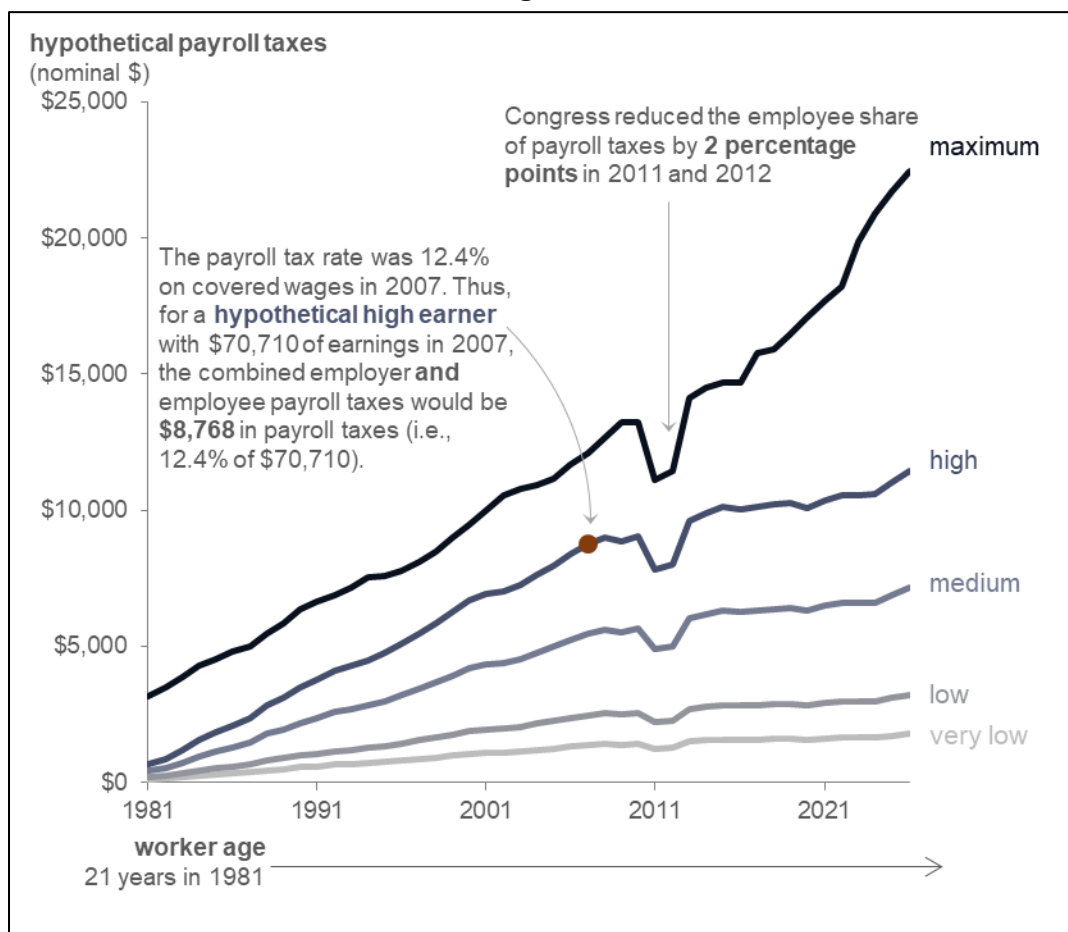
Notes: Rates are for the Social Security payroll tax on covered earnings. Employees and employers pay an equal tax on covered earnings (i.e., 6.2% on covered earnings in 2023). Employers did not receive a reduction in the payroll tax rate during the temporary 2011-2012 employee rate reduction, meaning employers continued to pay a tax of 6.2% of covered wages during those years.

The combined payroll tax rate multiplied by workers' earnings up to the taxable maximum results in payroll tax revenues for the program, its largest source of revenue.²⁴ On an individual basis, the payroll taxes paid by a worker are equal to the employee portion of the payroll tax (i.e., 6.2%) multiplied by the individual's covered earnings up to the taxable maximum. **Figure 3** illustrates the total (i.e., combined) amount of payroll taxes paid in nominal terms from 1981 through 2021 by hypothetical earners in the 1960 birth cohort. The line for each earner profile in **Figure 3** is the product of the combined payroll tax rate in a given year (**Figure 2**, the light grey line) and the worker's hypothetical earnings (**Figure 1**). As seen in the figure, payroll taxes paid are directly related to earnings level. Said differently, a hypothetical high earner pays the same share but more in absolute dollar amounts in payroll taxes than a hypothetical low earner does. Because a

²⁴ For other sources of revenue, see CRS In Focus IF12375, *Social Security: Selected Findings of the 2023 Annual Report*.

maximum earner—by definition—always earns at the maximum taxable level in a given year, **Figure 3** also shows the maximum payroll taxes that could have been paid by such a worker in the 1960 birth cohort.

Figure 3. Hypothetical Social Security Payroll Taxes for the 1960 Birth Cohort by Worker Earnings Level, 1981-2026



Source: CRS.

Scheduled Benefits

The Social Security benefit computation process involves four main steps. First, a summarized measure of lifetime Social Security–covered earnings is computed. This measure is called the *average indexed monthly earnings (AIME)*. Rather than using the amounts earned in past years directly, the AIME computation process first updates past earnings to account for the growth in overall economy-wide earnings. That is done by increasing each year of a worker’s taxable earnings after 1950 by the growth in average wages in the economy, as measured by SSA’s AWI, from the first year of work until two years prior to eligibility for benefits, which for retired workers is at age 60. For instance, the national average wage grew from \$32,155 in 2000 to \$41,674 in 2010. So, if a worker earned \$20,000 in 2000 and turned 60 in 2010, the indexed wage for 2000 would be $\$20,000 \times (\$41,674/\$32,155)$, or \$25,921. After indexing each year, the highest 35 years of indexed earnings are summed and divided by 420 (the number of months in 35 years) to produce the AIME—a monthly measure of indexed past earnings.

Second, a progressive benefit formula is applied to the AIME to compute the primary insurance amount (PIA). To compute the PIA, the AIME is sectioned into three brackets (or segments) of earnings by two specified dollar amounts known as bend points. The bend points are indexed to the AWI, so they generally increase each year.²⁵ Three factors—fixed by law at 90%, 32%, and 15%—are applied to the three brackets of AIME to allow for a progressive benefit formula. That is, the lowest bracket of the AIME is replaced at 90%, the middle bracket of the AIME is replaced at 32%, and the highest bracket of AIME is replaced at 15%. The sum of the three products (bracket of earnings multiplied by its respective replacement rate) is the PIA. **Table 1** shows the resulting AIME and PIA calculation using the hypothetical workers' earnings from **Figure 1**.

Table 1. Social Security Benefit Formula for Hypothetical Workers Born in 1960

Factor	Average Indexed Monthly Earnings (AIME)	Very Low (\$1,155)	Low (\$2,080)	Medium (\$4,623)	High (\$7,396)	Maximum (\$11,430)
90%	of the first \$1,024, plus	921.60	921.60	921.60	921.60	921.60
32%	of AIME over \$1,024 and through \$6,172 (if any), plus	41.92	377.92	1,151.68	1,647.36	1,647.36
15%	of AIME over \$6,172 (if any)	0.00	0.00	0.00	183.60	788.70
Total: Worker's Primary Insurance Amount (PIA)		963.50	1,259.50	2,073.20	2,752.50	3,357.60

Source: CRS, based on SSA, Office of the Chief Actuary (OCACT), "Benefit Formula Bend Points," <https://www.ssa.gov/oact/cola/bendpoints.html>.

Notes: The bend points shown in the table apply to workers who first become eligible in 2022. Under current law, PIA is rounded down to the nearest dime (42 U.S.C. §415(a)(1)(A)). The AIMEs used in this table use career-average earnings for the hypothetical workers discussed in **Table A-1**.

Third, an adjustment may be made based on the age at which a beneficiary chooses to begin receiving benefits. For retired workers who claim benefits at the full retirement age (FRA), the monthly benefit equals the PIA adjusted by annual cost-of-living adjustments (COLAs). Retired workers who claim benefits earlier than the FRA receive monthly benefits that are lower than the PIA (i.e., an actuarial reduction).²⁶ The FRA for workers born in 1960 and later is 67. The earliest eligibility age—the age at which a retired worker can first claim benefits—is 62. The actuarial reduction equals five-ninths of 1% for each month (6⅔% per year) for the first three years of early claim and five-twelfths of 1% for each month (5% per year) beyond 36 months. For instance, a worker born in 1960 (FRA of 67) claiming at age 62 (60 months before FRA) would receive 70% of his or her PIA plus any COLAs. Those who claim later than the FRA receive benefits higher than the PIA. The permanent increase in monthly benefits that applies to those who claim after the FRA is called the delayed retirement credit.²⁷ For people born in 1943 and

²⁵ Bend points are indexed to the AWI and can decrease when the AWI decreases (42 U.S.C. §415(a)(1)(B)). For more information on effects of wage indexing and price indexing on benefits, see CRS Report R46819, *Social Security: The Effects of Wage and Price Indexing on Benefits*.

²⁶ The permanent reduction in benefits resulting from actuarial reductions takes into account the longer expected period of benefit receipt. That is, a worker claiming benefits at age 62—the early eligibility age—would receive a lower benefit but over a longer period of time, on average. Although life expectancies have generally increased during SSA's history, gains in life expectancy have not been equally distributed across sex, race, educational attainment, and income level.

²⁷ Delayed retirement credits result in higher benefit amounts. That is, a worker claiming benefits at age 70 would receive a higher benefit than the same worker claiming benefits at age 67. However, with the same life expectancy, the former would result in a shorter period of benefit collection.

later, that credit is 8% for each year of delayed claim after the FRA up to age 70. Thus, a worker born in 1960 (FRA of 67) claiming at age 70 (36 months after FRA) would receive 124% of his or her PIA plus any COLAs.

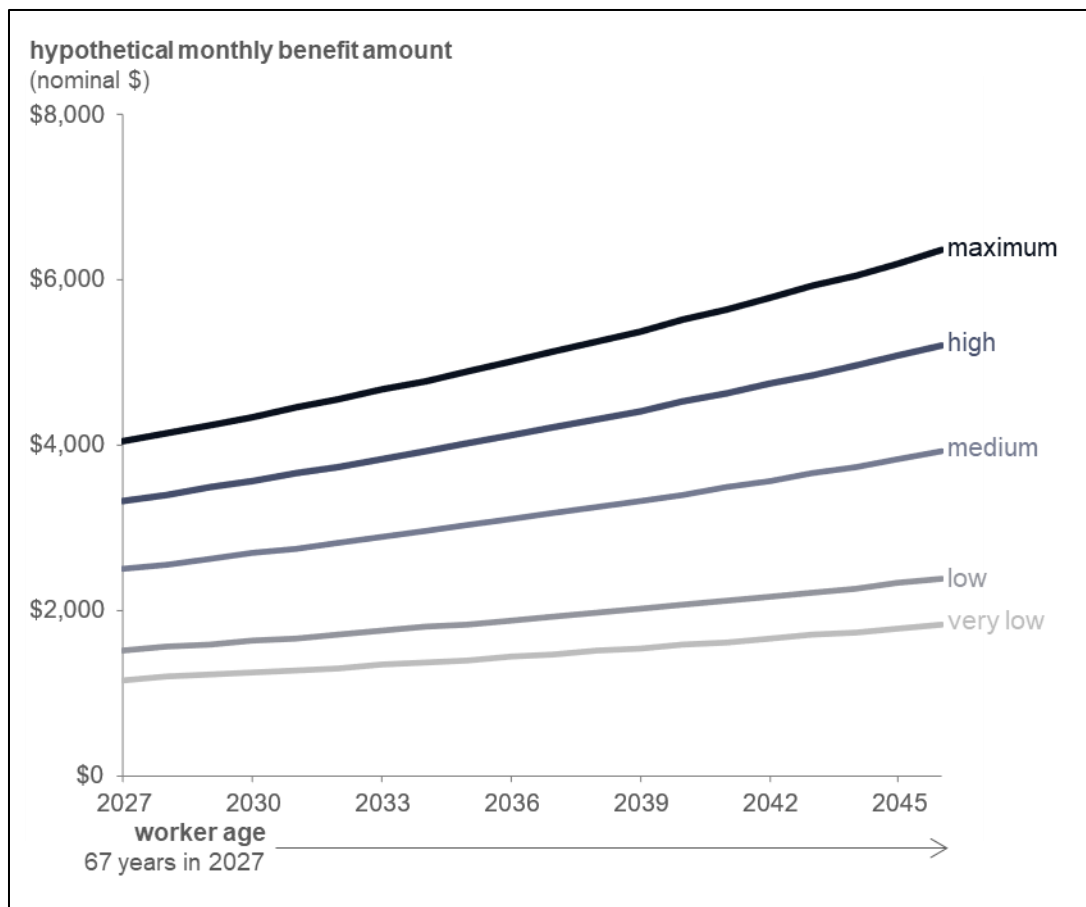
Lastly, a COLA is applied to the benefit beginning in the second year of eligibility, which for retired workers is age 63. The COLA applies even if a worker has not yet begun to receive benefits. The COLA equals the growth in the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) from the third quarter of one calendar year to the third quarter of the next calendar year.²⁸ The COLA becomes effective in December of the current year and is payable in January of the following year.²⁹

Figure 4 illustrates the projected monthly benefit amount for each hypothetical earner type of the 1960 birth cohort in nominal dollars assuming benefit collection starting at the FRA (i.e., PIAs adjusted by projected annual COLAs). Benefit amounts for each earner profile increase over time, reflecting the COLA adjustment. The *same rate* of adjustment is applied to all workers in each year.

²⁸ COLAs cannot be less than zero. That is, in years where there is no increase in the price index over the measurement period, no COLA is payable. This happened in 2010, 2011, and 2016.

²⁹ Retired-worker benefits can be affected by other adjustments. For example, the windfall elimination provision can reduce benefits for individuals who receive pensions based on employment not covered by Social Security, and benefits can be temporarily withheld under the retirement earnings test if a beneficiary under the FRA continues to work and earns above a certain amount. Although not an adjustment, the individual income tax can affect Social Security beneficiaries with substantial non-Social Security income and, thus, the beneficiary's net income. For more information, see CRS Report 94-803, *Social Security: Cost-of-Living Adjustments* and CRS Report RL32552, *Social Security: Taxation of Benefits*.

Figure 4. Projected Hypothetical Scheduled Social Security Benefits for the 1960 Birth Cohort in Nominal Monthly Amounts by Worker Earnings Level, 2027-2046



Source: CRS.

Notes: The earners in this figure are assumed to have claimed benefits at the FRA. COLAs are based on the trustees' 2023 intermediate assumptions.

Hypothetical Earnings, Payroll Taxes, and Benefits Across Birth Cohorts

Over its history, the AWI has increased in all but one year (2009), and it has increased at an average annual rate of 4.5%.³⁰ Given this, and the method used to compute hypothetical earnings, the wages of hypothetical earners are expected to increase from one birth cohort to the subsequent birth cohort. Said differently, a worker who consistently earned *medium* wages and was born in 2000 will likely have higher nominal earnings than will a worker who consistently earned *medium* wages and was born in 1980.

Additionally, as nominal earnings have generally increased, the hypothetical payroll taxes paid by more recent birth cohorts are also expected to increase relative to previous birth cohorts. As discussed, the payroll taxes paid are the payroll tax rate multiplied by earnings, which typically increase from one birth cohort to the subsequent birth cohort. Thus, the payroll taxes paid by a *medium* earner born in 2000 over his or her career are expected to be more than those of a *medium* earner born in 1980.

Lastly, after accounting for differences in earning levels, Social Security benefits are generally higher for workers in later cohorts. This is largely due to the increase in average wages over time, both overall and within hypothetical earner profiles, but may also be due to differences in AWI growth for different cohorts. As noted earlier, benefit amounts are a function of earnings received in each year of a worker's career and the growth rate in the AWI over the course of that career, among other factors (e.g., COLA adjustments, timing of claims relative to the FRA). To the extent that the AWI grows at different rates over time, benefit amount calculations will vary across cohorts, even for two workers born in different years with identical earnings histories. In sum, a worker who consistently earned *medium* wages born in 2000 will likely have a higher benefit amount than a worker who consistently earned *medium* wages and was born in 1980, because wage growth over this timespan (i.e., 1980-2000) was positive and the rate of AWI growth also varied.

For these reasons, the ensuing analysis presents results for hypothetical earners in four birth cohorts: 1960, 1980, 2000, and 2020. In each case, the same set of SSA-developed scaled factors are used to define earner profiles, where the scaled factors are applied to age-specific AWIs.³¹

³⁰ For more information, see CRS In Focus IF11599, *Social Security Benefits and the Effect of Declines in Average Wages and Prices*.

³¹ For some younger cohorts, not all program factors are known. In this case, this methodology uses the intermediate assumptions published in the 2023 Annual Report. The intermediate set of assumptions represents the trustees' best estimate of likely future conditions.

Select Measures for Hypothetical Earners Across Birth Cohorts

Table 2 presents selected measures used to describe the Social Security benefits and payroll taxes: effective benefit rate, effective tax rate, and benefit-to-tax ratio. The first two measures—the effective benefit rate and the effective tax rate—each use the hypothetical worker’s total lifetime earnings as the denominator. Expressing total benefits and taxes as a percentage of an individual’s career-covered earnings accounts for growth in wages over time (i.e., across birth cohorts) and allows for meaningful comparisons across groups. These rates and the ratio are provided for four birth cohorts (1960, 1980, 2000, and 2020) under current law (i.e., scheduled amounts).

Discount Rates

Benefits, taxes, and earnings in this report are indexed to 2022 dollars using a nominal interest rate equal to the rate of inflation (i.e., a zero real interest rate). Indexed amounts are then used to calculate effective benefit rates, effective tax rates, and benefit-to-tax ratios. The choice of discount rate can have substantial effects on calculations. A discussion of discount rates can be found in the **Appendix**.

Effective Benefit Rate

The *effective benefit rate* measures how much a worker is expected to collect in lifetime benefits as a percentage of his or her total career-covered earnings, up to the taxable maximum if applicable. All workers in this report are assumed to claim benefits at their FRAs (age 67).³⁴

Claiming Age

All workers in this report are assumed to claim benefits at their FRAs (age 67). In reality, not all workers collect benefits at their FRAs. Data shows that claiming ages are generally clustered around age 62 (i.e., the earliest eligibility age), the full retirement age, and age 70 (i.e., the age at which delayed retirement credits are no longer credited).³² The FRA is 67 for all birth cohorts 1960 and later. Some researchers have used age 65 for their analyses.³³

For example, the (scheduled) effective benefit rate for a very low earner in the 1960 birth cohort is estimated to be 40.8% (i.e., estimated lifetime benefits of \$233,062 compared to estimated lifetime earnings of \$571,259³⁵). In comparison, the (scheduled) effective benefit rate for a very low earner in the 1980 birth cohort is estimated to be 45.7% (i.e., estimated lifetime benefits of \$322,628 compared to estimated lifetime earnings of \$705,308). A comparison of the two rates reveals that workers in the younger (1980) cohort are expected to receive total benefits that are a higher share of their career earnings than the older cohort (1960).

Variations in (scheduled) effective benefit rates between similar earners of different birth cohorts are largely attributable to differences in average life expectancy and the index factors used to calculate a worker’s AIME.³⁶

³² For more information on age distribution of new retired-worker beneficiaries, see CRS Report R44670, *The Social Security Retirement Age*.

³³ See, for example, Michael Clingman, Kyle Burkhalter, and Chris Chaplain, *Money’s Worth Ratios Under the OASDI Program for Hypothetical Workers*, OCACT, April 2022, <https://www.ssa.gov/OACT/NOTES/ran7/an2021-7.pdf>; and C. Eugene Steuerle and Karen E. Smith, “Social Security and Medicare Benefits and Taxes: 2023,” Urban Institute, <https://www.urban.org/sites/default/files/2023-10/Social%20Security%20and%20Medicare%20Benefits%20and%20Taxes%202023.pdf>.

³⁴ This analysis considers retired-worker benefits only, assumed to be claimed at the FRA. It does not consider disability benefits that may have been claimed prior to the FRA, nor does it consider auxiliary benefits (either accruing to other family members on the retired worker’s record or accruing to the retired worker from another family member’s record).

³⁵ Amounts are in 2022 dollars.

³⁶ For instance, **Table 2** shows the effective benefit rates for medium earners in the 1960, 1980, 2000, and 2020 birth (continued...)

Life Expectancy

In general, females have a longer life expectancy. For example, at age 67, more females of a birth cohort are expected to survive to 68 (and future years) than males. Thus, to calculate average life expectancy, this report uses a gender-adjusted life expectancy that is an average *weighted* by gender. This method is consistent with previous research.³⁷

In all cases, workers are assumed to first claim benefits at the FRA, or age 67. Each cohort's life expectancy is calculated as the gender-adjusted average life expectancy at age 67. For example, the cohort life expectancy at age 67 for a male born in 1960 is 17.88 years, and the cohort life expectancy at age 67 for a female born in 1960 is 20.29 years. The simple average is 19.09 years, but the gender-adjusted average is 19.16 years (or 19 years and 2 months).³⁸ This method of calculation will represent a birth cohort's life expectancy at age 67 *on average*. Life expectancies are generally projected to increase over time. For example, gender-adjusted average life expectancy at age 67 for the 1980 birth cohort is 20 years and 3 months. The average expectancy continues to increase for the 2000 birth cohort (21 years and 4 months) and more still for the 2020 birth cohort (22 years and 3 months).³⁹

Effective Tax Rate

The *effective tax rate* measures how much a worker paid into the system as a percentage of his or her total career-covered earnings, up to the taxable maximum if applicable. Only payroll taxes through age 66 are included in this measure as the worker is assumed to begin benefit collection at age 67.

For example, the (scheduled) effective tax rate for a medium earner in the 1960 birth cohort is estimated to be 12.19% (i.e., estimated lifetime taxes of \$278,615 compared to estimated lifetime earnings of \$2,284,749). In comparison, the (scheduled) effective tax rate for a medium earner in the 1980 birth cohort is estimated to be 12.33% (i.e., estimated lifetime taxes of \$347,791 compared to estimated lifetime earnings of \$2,820,879). A comparison of the two rates reveals that workers in the younger (1980) cohort are expected to experience a higher effective tax rate than the older cohort (1960). Variations in (scheduled) effective tax rates represent changes in the statutory payroll tax rate (see **Figure 2**).

Payroll Taxes

To calculate the effective tax rate, this report includes the total OASDI payroll tax. The payroll tax burden is often believed to fall on workers as the employer's share of payroll taxes is passed on to employees in the form of lower wages (see footnote 18). As such, some research has included total combined OASDI payroll taxes (12.4%), while other research has included only the combined portion of the OASI payroll tax (10.6%).⁴⁰

cohorts to be 22.0%, 24.6%, 25.7%, and 26.7%, respectively. Under the hypothetical situation in which all cohorts were to experience the same gender-adjusted life expectancy at age 67 of 19 year and 2 months (i.e., the same as the 1960 birth cohort), the effective benefit rates would be 22.0%, 23.3%, 23.1%, and 23.0%, respectively. The remaining differences in effective benefit rates are explained by variations in the historical versus projected AWI values used to calculate a worker's AIME.

³⁷ See footnote 33.

³⁸ This calculation uses projections included in "cohort life tables." OCACT, "Cohort Life Tables," 2023, <https://www.ssa.gov/OACT/HistEst/CohLifeTablesHome.html>.

³⁹ For this analysis, the same average life expectancy is applied to all members of a birth cohort, regardless of income or other demographic factors. Although life expectancies have generally increased year to year, the gains in life expectancy have not been evenly distributed across demographic factors such as income, race, and educational attainment. For more information, see CRS Report R44846, *The Growing Gap in Life Expectancy by Income: Recent Evidence and Implications for the Social Security Retirement Age*.

⁴⁰ See footnote 33. For current law tax rates, see <https://www.ssa.gov/oact/progdata/oasdiRates.html>.

Benefit-to-Tax Ratio

The *benefit-to-tax ratio* is the lifetime value of a worker's benefits received divided by the lifetime value of taxes paid by the worker. Mathematically, it is equivalent to the effective benefit rate divided by the effective tax rate.

For example, the (scheduled) benefit-to-tax ratio for a high earner in the 1960 birth cohort is estimated to be 1.49 (i.e., estimated lifetime benefits of \$665,895 compared to estimated lifetime taxes of \$445,775). In comparison, the (scheduled) benefit-to-tax ratio for a high earner in the 1980 birth cohort is estimated to be 1.66 (i.e., estimated lifetime benefits of \$921,518 compared to estimated lifetime taxes of \$556,459).⁴¹ A comparison of the two ratios reveals that workers in the younger (1980) cohort are expected to have a higher benefit-to-tax ratio than the older cohort (1960).

Scheduled Benefits and Taxes Under Current Law

Table 2 shows how these scheduled measures—effective benefit rate, effective tax rate, benefit-to-tax ratio—are expected to vary by hypothetical earnings level for the selected birth cohorts: 1960, 1980, 2000, and 2020. The effective benefit rate is higher for relatively low earners than for relatively higher earners. This illustrates the benefit formula's progressivity: A higher share of earnings is replaced for workers with lower career earnings than for those with higher career earnings. It also shows that, within a given hypothetical earner profile, the effective benefit rate is higher for younger cohorts.⁴²

In **Table 2**, the effective tax rate reflects the payroll tax rate on a worker's career covered earnings. This rate differs from the current payroll tax rate for some workers because the rate has changed over time. A hypothetical earner born in 1960 entered the workforce in 1981 at age 21. In 1981, the combined payroll tax rate for workers was 10.7%. The payroll tax rate gradually increased until it reached 6.2% in 1990. Thus, for several years the 1960 birth cohort paid into the system at a lower tax rate than subsequent birth cohorts did. Additionally, in the aftermath of the 2007-2009 recession, Congress passed temporary reductions on the employee payroll tax rate. The employee tax rate was reduced by 2 percentage points in 2011 (by P.L. 111-312) and in 2012 (by P.L. 112-78 and P.L. 112-96).⁴³

For most taxpayers, payroll tax burdens are proportional to earnings. Due to the cap on earnings subject to the payroll tax, payroll taxes are regressive to the extent they do not apply to earnings above the taxable maximum. This means that, as taxpayers' earnings increase above the taxable maximum, the share of earnings paid in payroll taxes decreases.⁴⁴ Also important is that the

⁴¹ Alternatively, this could be calculated by dividing the worker's effective benefit rate (20.4%) by the effective tax rate (6.13%).

⁴² As discussed, this is primarily attributed to increases in life expectancy.

⁴³ These temporary employee payroll tax decreases included provisions for General Fund transfers to the Social Security trust funds so they would be "made whole." See footnote 20.

⁴⁴ According to estimates from CBO, in 2018, households in the lowest quintile (earning an average of \$22,500) paid 9.5% of their income in payroll taxes, whereas households in the highest quintile (earning an average of \$321,700) paid 6.4% of their income in payroll taxes. These figures include all federal payroll taxes, such as the (smaller) federal Medicare Hospital Insurance tax and federal unemployment taxes. In FY2020, the Social Security tax raised 74% of all federal payroll tax receipts. For distribution figures, see CBO, *The Distribution of Household Income, 2018*, supplemental data tables 3 and 9 (published August 4, 2021), <https://www.cbo.gov/publication/57061>.

Social Security tax is levied only on wage income, and non-wage income is not reflected in the estimates in this report.⁴⁵

Table 2. Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort Under Current Law

Under 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Effective Benefit Rate					
1960	40.8%	29.6%	22.0%	18.2%	13.4%
1980	45.7%	33.2%	24.6%	20.4%	15.0%
2000	47.7%	34.7%	25.7%	21.3%	15.8%
2020	49.7%	36.1%	26.7%	22.2%	16.4%
Effective Tax Rate					
1960	12.19%	12.19%	12.19%	12.19%	12.14%
1980	12.33%	12.33%	12.33%	12.33%	12.33%
2000	12.40%	12.40%	12.40%	12.40%	12.40%
2020	12.40%	12.40%	12.40%	12.40%	12.40%
Benefit-to-Tax Ratio					
1960	3.35	2.43	1.80	1.49	1.10
1980	3.71	2.69	1.99	1.66	1.22
2000	3.85	2.79	2.07	1.72	1.28
2020	4.01	2.91	2.16	1.79	1.33

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume scheduled benefits and payroll taxes paid under the 2023 intermediate assumptions and current law.

Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total payroll taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

Projected Exhaustion of the Trust Funds

From 1983 through 2009, Social Security operated with cash surpluses wherein tax revenues exceeded program expenses. Each of those year's cash surpluses was invested in government

⁴⁵ Taxpayers with higher incomes, such as a hypothetical maximum earner, are more likely to have income that is not subject to the Social Security tax (i.e., income that is not taxable nor creditable for program purposes), such as income from dividends, capital gains, interest, or rent. According to CBO analysis of incomes in 2019, labor income (i.e., wage and salary) made up at least 62% of average market income for households in the lower 95% of the income distribution. Labor income comprised nearly 58% of market income for households in the 96th-99th percentiles. At almost 32%, labor earnings make up a lower (but still significant) share of market income among households in the top 1%. CBO defines *market income* as labor income, business income, capital gains realized from the sale of assets, capital income excluding capital gains, and income received in retirement for past services or from other sources. Conceptually, these percentages may underestimate total labor income because they exclude business income, and some business owners contribute labor to their firms and are compensated in the form of business income in lieu of wages. CBO, *The Distribution of Household Income and Federal Taxes*, 2019, November 2022, supplemental data, <https://www.cbo.gov/publication/58353>.

securities and earned interest. (At the start of 2023, the combined trust fund balance was \$2.83 trillion.) Since 2010, the Social Security program has operated with cash deficits (i.e., expenses exceed tax revenues).⁴⁶ However, from 2010 through 2020, the program still ran annual surpluses where total income (i.e., tax revenues *plus* interest on assets held in the trust funds balance) exceeded expenses. Augmenting tax revenues with interest income from asset reserves held in the trust funds allowed full scheduled benefits to be paid without redeeming assets held in the trust funds. In 2021, Social Security experienced its first annual deficit since 1982: In 2021, tax revenues plus interest income could not support total expenses. Consequently, in 2021, Social Security was obligated to redeem asset reserves held in the trust funds to provide the additional \$56 billion that was needed to pay scheduled benefits in that year. In 2022, a further \$22 billion in asset reserves needed to be redeemed to pay full scheduled benefits. Given the trustees' intermediate projections of rising costs—and rising annual deficits—the program is expected to redeem an increasing amount of assets in future years. Growing annual deficits are projected through 2034, the projected year of asset reserve depletion.

The projected increasing annual deficits imply that Social Security will experience a weaker financial position with each year. Eventually, if the future experience unfolds in a manner similar to the trustees' intermediate assumptions, the program will be unable to pay full scheduled benefits. To demonstrate the extent of the projected financial shortfall, the trustees estimate changes in the payroll tax rate and benefits that would be required to keep the trust funds solvent. For instance, in their 2023 Annual Report, they state:

To illustrate the magnitude of the 75-year actuarial deficit, consider that for the combined OASI and DI Trust Funds to remain fully solvent throughout the 75-year projection period ending in 2096: (1) revenue would have to increase by an amount equivalent to an immediate and permanent payroll tax rate increase of 3.44 percentage points to 15.84 percent beginning in January 2023; (2) scheduled benefits would have to be reduced by an amount equivalent to an immediate and permanent reduction of 21.3 percent applied to all current and future beneficiaries effective in January 2023, or 25.4 percent if the reductions were applied only to those who become initially eligible for benefits in 2023 or later; or (3) some combination of these approaches would have to be adopted.

If substantial actions are deferred for several years, the changes necessary to maintain Social Security solvency would be concentrated on fewer years and fewer generations. Significantly larger changes would be necessary if action is deferred until the combined trust fund reserves become depleted in 2034. For example, maintaining 75-year solvency through 2097 with changes that begin in 2034 would require: (1) an increase in revenue by an amount equivalent to a permanent 4.15 percentage point payroll tax rate increase to 16.55 percent starting in 2034, (2) a reduction in scheduled benefits by an amount equivalent to a permanent 25.2 percent reduction in all benefits starting in 2035, or (3) some combination of these approaches.⁴⁷

Table 3 displays how these hypothetical estimates have changed in the 10-year period from 2014 through 2023. As shown, the estimated payroll tax rate increase and estimated benefit reduction to

⁴⁶ Under the Board of Trustees' intermediate assumptions, the trustees project cash deficits for the remainder of the 75-year projection period (2023 Annual Report, p. 2).

⁴⁷ "The 3.44 percentage point increase in the payroll tax rate required to achieve 75-year solvency through 2097 differs somewhat from the 3.61 percent actuarial deficit. This is primarily because the rate increase required to achieve 75-year solvency reflects a zero trust fund reserve at the end of the period in 2097, whereas the 3.61 percent actuarial deficit incorporates an ending trust fund reserve equal to one year's cost. While such an increase in the payroll tax rate would cause some behavioral changes in earnings and ensuing changes in benefit levels, such changes are not included in these calculations because they are assumed to have roughly offsetting effects on OASDI actuarial status over the 75-year long-range period as a whole" (2023 Annual Report, pp. 5-6).

maintain solvency—in both immediate and delayed (at the time of projected insolvency) scenarios—have increased. This characteristic is reflective of the program’s rising costs.

Table 3. Estimated Hypothetical Measures to Maintain Trust Fund Solvency Under Four Scenarios Proposed by the Social Security Board of Trustees

2014-2023, in Percentage Points (pp) and Percent (%)

	<u>Scenario 1</u>	<u>Scenario 2</u>	<u>Scenario 3</u>	<u>Scenario 4</u>		
Year of Report	Immediate Payroll Tax Increase (pp)	Immediate Benefit Reduction	Delayed Payroll Tax Increase (pp)	Delayed Benefit Reduction	Projected Year of Asset Reserve Exhaustion	Long-Range Actuarial Balance
2014	2.83	17.4%	4.20	23%	2033	-2.88%
2015	2.62	16.4%	3.70	21%	2034	-2.68%
2016	2.58	16.0%	3.58	21%	2034	-2.66%
2017	2.76	17.0%	3.98	23%	2034	-2.83%
2018	2.78	17.0%	3.87	23%	2034	-2.84%
2019	2.70	17.0%	3.65	23%	2035	-2.78%
2020	3.14	19.0%	4.13	25%	2035	-3.21%
2021	3.36	21.0%	4.20	26%	2034	-3.54%
2022	3.24	20.0%	4.07	25%	2035	-3.42%
2023	3.44	21.3%	4.15	25%	2034	-3.61%

Source: CRS, compiled from Board of Trustees Annual Reports from 2014 to 2023.

Notes: Estimated payroll tax increases are the combined employer and employee tax rate increases (i.e., if the payroll tax rate were to have increased in 2023 according to the table, the employer and employee would each have had to pay an additional 1.72 percentage points [half of 3.44 percentage points]). Delayed actions are estimated for implementation in the projected year of asset reserve depletion. The program’s long-range financial status is measured by the actuarial balance, which is the difference between the summarized cost rate and the summarized income rate over the 75-year projection period. The summarized cost rate and the summarized income rate are expressed as a percentage of taxable payroll. Taxable payroll is a weighted sum of taxable wages, including wages from self-employment. Taxable payroll multiplied by the payroll tax rate yields the total amount of payroll taxes. The long-range actuarial balance is generally of greater magnitude than the immediate payroll tax increase, as it incorporates a trust fund reserve of at least one year’s projected cost.

The remainder of this report considers the impact on workers of these hypothetical changes across earnings levels and birth cohorts for each of the four hypothetical policy scenarios presented for 2023 in **Table 3**. These impacts are presented in terms of the percentage point change in the effective benefit rate and effective tax rate and the change to the benefit-to-tax ratio (a unitless measure).

Solvency Measures

Hypothetical solvency measures (i.e., immediate and delayed payroll tax rate increases or benefit cuts) illustrate the magnitude of the projected financial shortfall. In practice, there are many more solvency-related measures available to lawmakers. For instance, eliminating the taxable maximum would subject more money to the payroll tax, thereby increasing revenues. Alternatively, increasing the FRA would reduce costs. The Social Security

Amendments of 1983 (P.L. 98-21), commonly considered the last major reform to the Social Security program, extended the program's solvency by a combination of revenue-increasing and cost-reducing measures.⁴⁸

Treatment of COLAs in Analysis of the Board of Trustees' Policy Scenarios

As stated above, the hypothetical scenarios presented in **Table 3** are estimated to allow the combined trust funds to “remain fully solvent” over the applicable future 75-year period. The trustees “consider the trust funds to be solvent at any point in time if the funds can pay scheduled benefits in full on a timely basis.”⁴⁹ Under current law, scheduled benefits generally include annual COLAs.

The Social Security COLA is based on the increase (if any) in the CPI-W over a specified measurement period—that is, the increase in the CPI-W from the third quarter average for the base calendar year (typically the previous calendar year) to the third-quarter average for the current calendar year. The COLA becomes effective in December of the current year and is payable in January of the following year. (Monthly benefits reflect the benefits due for the preceding month.) In some years, there may be a decrease in the CPI-W over the measurement period. Such was the case for COLAs computed in 2009, 2010, and 2015 (for benefits payable in 2010, 2011, and 2016, respectively). Social Security benefits are protected from a decrease in average prices (i.e., a COLA cannot be negative). In those years, benefit amounts remained unchanged.⁵⁰

Under current law, COLAs are calculated using the CPI-W only when the *trust fund ratio* is above 20%.⁵¹ The trust fund ratio is defined as the value of asset reserves (i.e., the combined trust funds) at the beginning of a year divided by the program's projected cost for that year. When the trust fund falls below 20%, the AWI (i.e., change in average wages) is used to calculate any payable COLA.⁵² Under the intermediate assumptions, the trust fund ratio is projected to decrease from 25% in 2033 to 7% in 2034 (the projected year of asset reserve exhaustion).⁵³

The projected trust fund ratios under each of the four hypothetical scenarios are unknown. For example, it is unknown when the hypothetical immediate payroll tax increase scenario would ensure a trust fund ratio that is above 20%. For this reason, the scheduled benefits projected under current law (i.e., **Table 2**) and the COLAs in each of the four hypothetical scenarios presented in this report are calculated using the projected COLAs based on projected changes to the CPI-W.

Immediate Payroll Tax Rate Increase Effective in 2023 (Scenario 1)

One hypothetical provision to ensure trust fund solvency—and the payment of full scheduled benefits—throughout the 75-year projection period would have been an immediate (2023)

⁴⁸ For more information on the Social Security Amendments of 1983 see CRS Report R47040, *Social Security: Trust Fund Status in the Early 1980s and Today and the 1980s Greenspan Commission*.

⁴⁹ 2023 Annual Report, p. 41.

⁵⁰ For more information, see CRS Report 94-803, *Social Security: Cost-of-Living Adjustments*.

⁵¹ 42 U.S.C. §415(i)(1)(C).

⁵² From 1975, when automatic COLAs first became payable, through the 2023 COLA, the increase in AWI has been larger than the COLA 16 times. Thus, using the AWI rather than the CPI-W to calculate COLAs may not always result in a smaller (i.e., less costly) COLA.

⁵³ See supplemental single-year Table IV.B4 at <https://www.ssa.gov/OACT/TR/2023/lr4b4.html>.

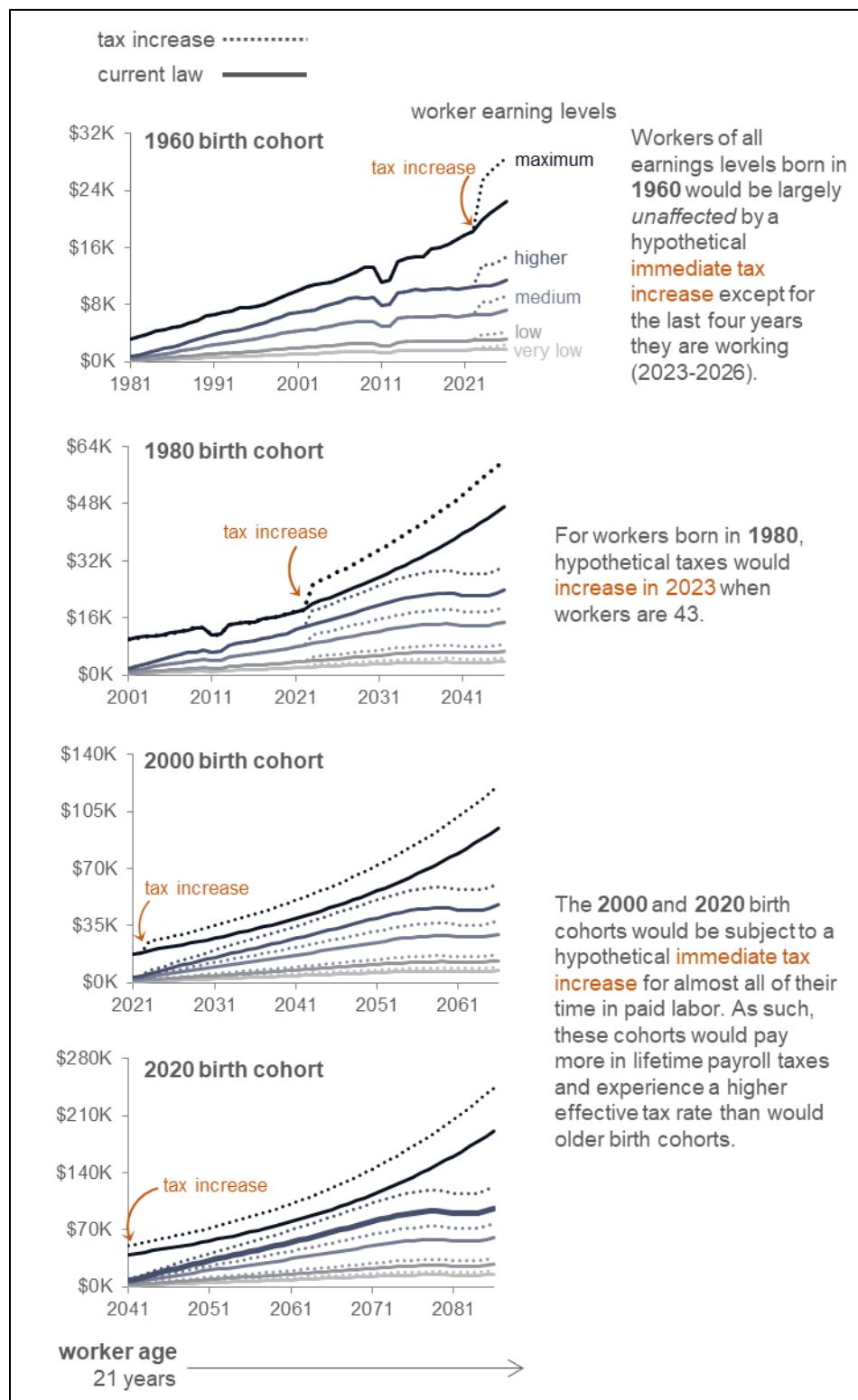
increase in the payroll tax rate (see **Table 3**). Under the intermediate assumptions, the trustees estimate that it would require a payroll tax rate increase of 3.44 percentage points (with employees and employers each paying a 1.72 percentage point increase). Such a change would require Congress to enact legislation to amend current law.

When examined over a career of covered employment, the tax burden created by an increase in the payroll tax rate is not expected to be shared equally across worker age groups. **Figure 5** shows how this would affect workers' annual total payroll taxes by earnings levels and birth cohorts. For each birth cohort—1960, 1980, 2000, and 2020—the amount of annual combined payroll taxes increases by earnings level. That is, in each case, relatively high earners pay more in payroll taxes than do relatively lower earners. This makes sense by definition: The payroll tax is applied equally to all covered earnings. Because total payroll taxes paid are a function of the payroll tax rate and covered wages, an increase in one necessarily increases the product of the two.

Figure 5 also highlights how a hypothetical immediate payroll tax rate increase would affect workers differently by birth cohort. As shown, the 1960 birth cohort would be affected for only a few years. (They reach age 67—the Social Security FRA—in 2027.) Thus, the lifetime effective payroll tax rate for these workers would be slightly higher than under current law. Other cohorts, though, would bear more of the additional tax burden created by a hypothetical immediate tax increase. For instance, **Figure 5** shows that the 1980 birth cohort would be affected starting at age 43 (in 2023). This cohort would be subject to a higher payroll tax rate than under current law for roughly half of their estimated time in paid labor. Thus, their effective tax rate would be higher than those of the 1960 birth cohort but less than those of the 2000 and 2020 birth cohorts. The 2000 birth cohort would be subject to an immediate hypothetical tax increase for almost all of their time in paid labor, and the 2020 birth cohort would be subject to an immediate hypothetical tax increase for their entire time in paid labor. As such, these cohorts would pay more in lifetime payroll taxes in nominal terms and experience a higher effective tax rate than would older birth cohorts.

Figure 5. Annual Combined Payroll Taxes by Birth Cohort and Worker Earnings Level Under Current Law and Immediate (2023) Payroll Tax Increase

In Nominal Dollars



Source: CRS.

Notes: The solid lines represent scheduled combined payroll taxes for hypothetical workers under current law and the 2023 intermediate assumptions. The dotted lines represent projected combined payroll taxes for hypothetical earners under an immediate increase in the combined payroll tax rate of 3.44 percentage points. Under this scenario, the total payroll tax rate would be 15.84% on covered wages. The x-axes are different for each birth cohort. However, the years correspond to ages 21-66 for each respective cohort (i.e., years of expected participation in the labor force). Additionally, the y-axes display different dollar values. This reflects the growth in economy-wide earnings. That is, given the projected growth in economy-wide earnings, a medium earner born in 2020 is expected to earn roughly 10 times more than is a medium earner born in 1960 in nominal terms. (Hence the y-axes for the 2020 cohort exhibit a wider range of values than the y-axes for the 1960 cohort.) Therefore, younger workers will pay more in total payroll taxes in nominal terms. However, as shown in **Table 2**, all cohorts are subject to the same scheduled payroll tax rate under current law.

An immediate payroll tax rate increase would not affect a beneficiary's—current or future—projected benefit level. However, as shown in **Figure 5**, it would affect the estimated total payroll taxes paid. This combination of effects is further highlighted in **Table 4**, which presents the changes in the selected measures (i.e., effective benefit rate, effective tax rate, and benefit-to-tax ratio) from scheduled amounts discussed earlier. **Table 4** shows that the effective benefit rates remained unchanged from **Table 2**. The effective tax rate, however, increases for all birth cohorts. Because this scenario assumes a payroll tax rate increase in 2023, the 1960 birth cohort is subject to an additional tax burden for only four years. The 1980 birth cohort would experience a higher payroll tax rate for about half of their years in paid labor (from 2023 to roughly 2041). Thus, their effective tax rate is between that of the 1960 birth cohort and the 2000 and 2020 birth cohorts. The 2000 birth cohort would experience the higher payroll tax rate for almost all their time in paid labor, whereas the 2020 birth cohort would experience the higher rate for all of their time in paid labor.

Because the 1960 birth cohort would be affected the least among the four cohorts analyzed, their benefit-to-tax ratios are likewise affected the least. The 1980 birth cohort would experience modestly higher taxes and a higher effective tax rate. However, the changes in the benefit-to-tax ratios for the 1980 cohort are comparatively smaller under an immediate tax increase scenario than the changes for the younger 2000 and 2020 cohorts. For instance, the benefit-to-tax ratio for a medium earner born in 1980 is projected to decrease by 0.30 (-14.90%) under an immediate tax increase scenario (**Table 4**). The younger cohorts would experience the largest increases in taxes and effective tax rates under an immediate tax rate scenario. As such, their benefit-to-tax ratios decrease the most when compared to scheduled amounts. For instance, the benefit-to-tax ratio for a medium earner born in 2020 is projected to decline by 0.47 (-21.72%) under an immediate tax increase scenario.

Table 4. Immediate (2023) Payroll Tax Increase: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort

Under the 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Benefit Rate					
1960	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2020	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Tax Rate					
1960	0.31 pp	0.31 pp	0.31 pp	0.31 pp	0.36 pp
	2.51%	2.51%	2.51%	2.51%	2.96%
1980	2.16 pp	2.16 pp	2.16 pp	2.16 pp	1.98 pp
	17.51%	17.51%	17.51%	17.51%	16.10%
2000	3.40 pp	3.40 pp	3.40 pp	3.40 pp	3.33 pp
	27.42%	27.42%	27.42%	27.42%	26.83%
2020	3.44 pp	3.44 pp	3.44 pp	3.44 pp	3.44 pp
	27.74%	27.74%	27.74%	27.74%	27.74%
Change and Percentage Change (%) in Benefit-to-Tax Ratio					
1960	-0.08	-0.06	-0.04	-0.04	-0.03
	-2.45%	-2.45%	-2.45%	-2.45%	-2.88%
1980	-0.55	-0.40	-0.30	-0.25	-0.17
	-14.90%	-14.90%	-14.90%	-14.90%	-13.87%
2000	-0.83	-0.60	-0.45	-0.37	-0.27
	-21.52%	-21.52%	-21.52%	-21.52%	-21.16%
2020	-0.87	-0.63	-0.47	-0.39	-0.29
	-21.72%	-21.72%	-21.72%	-21.72%	-21.72%

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume scheduled benefits paid under intermediate assumptions and current law and a payroll tax rate increase of 3.44 percentage points in 2023 and later years.

Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

Immediate Benefit Reduction Effective in 2023 (Scenario 2)

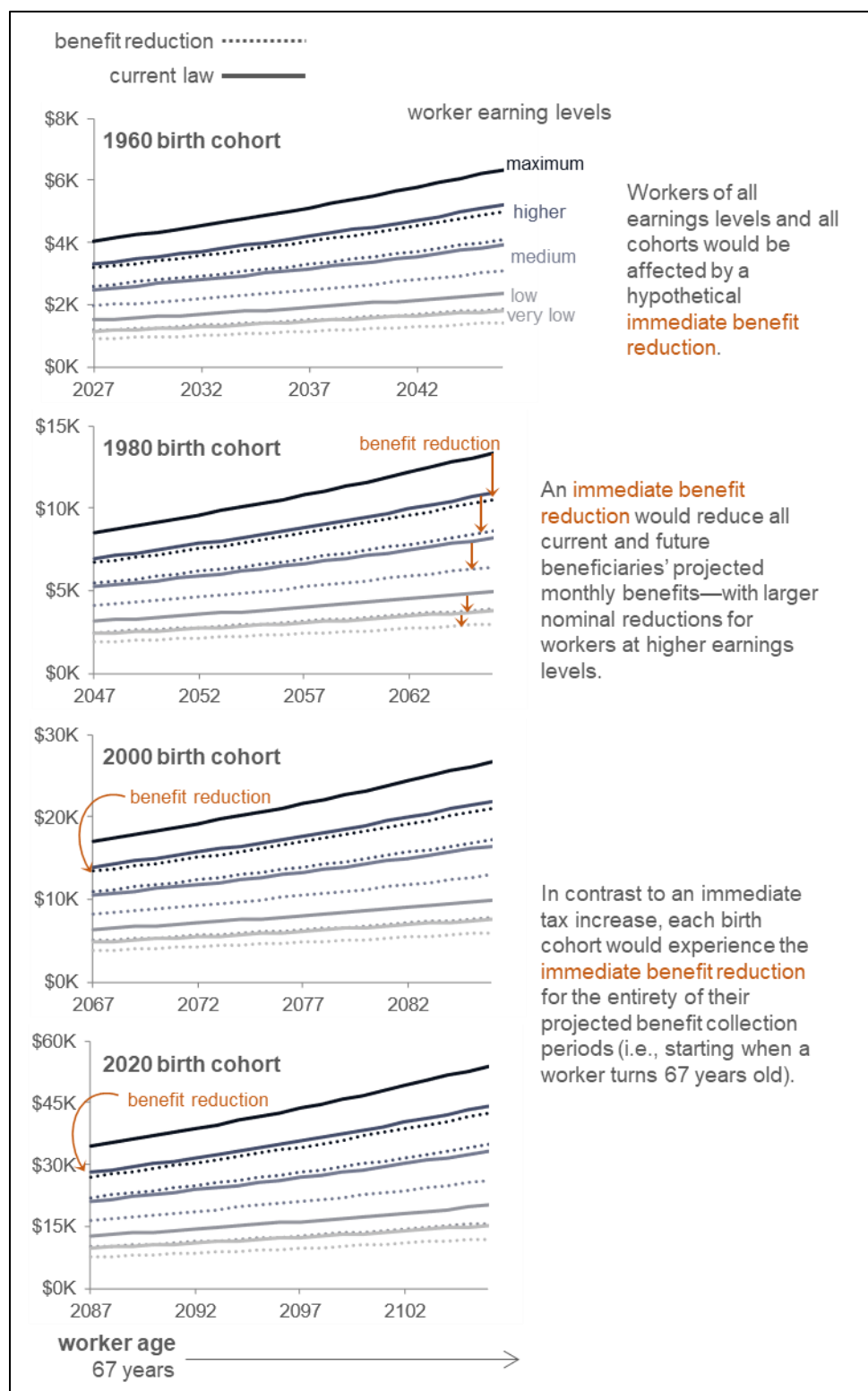
A second hypothetical provision to ensure trust fund solvency throughout the 75-year projection period would have been an immediate (2023) reduction in benefits. Under the intermediate assumptions, the trustees estimate that it would require an immediate benefit cut of 21.3% for all current and future beneficiaries (see **Table 3**). Such a change would require congressional action.

Unlike an immediate payroll tax rate increase, the effects of an immediate benefit cut would be shared more equally across the four birth cohorts used in this analysis. This is because all of the workers in the selected birth cohorts would reach FRA *after* the implementation of an immediate (2023) benefit cut. The oldest of the analyzed birth cohorts—1960—will not reach age 67 until 2027, whereas other birth cohorts are many years off. Thus, while the 1960 birth cohort would be relatively less affected by an immediate payroll tax increase, the same pattern would not be the case under an immediate benefit reduction (i.e., it is *not the case* that the benefit cut applies to only some of the benefit years for the older cohorts). This expected outcome is presented in **Figure 6** in terms of monthly benefits.

For each cohort, **Figure 6** shows that relatively higher earners are scheduled to receive higher monthly benefit amounts than would relatively lower earners, as expected. This feature remains after the hypothetical implementation of an immediate benefit reduction, because all workers would face the same percentage benefit reduction (i.e., 21.3%). That is, a hypothetical benefit reduction would “shift” the payable monthly benefits downward by about 21.3%. Although the level of benefits paid to workers of different earnings levels would be lower than scheduled amounts, the relatively higher earners still would receive more than relatively lower earners would. Moreover, each birth cohort would experience the benefit reduction for the entirety of their projected benefit collection periods. This is in contrast to effects of an immediate payroll tax rate increase, which would affect the older cohorts—1960 and 1980—by relatively smaller amounts.

Figure 6. Monthly Benefits by Earnings Level and Birth Cohort Under Current Law and Immediate (2023) Benefit Decrease

In Nominal Dollars



Source: CRS.

Notes: The solid lines represent scheduled monthly benefits for hypothetical beneficiaries under current law and the 2023 intermediate assumptions. The dotted lines represent projected monthly benefits for hypothetical beneficiaries under an immediate benefit reduction of 21.3%. The x-axes are different for each birth cohort. However, the years correspond to ages 67-87 for each respective cohort (i.e., years of expected benefit collection). Additionally, the y-axes display different dollar values. This reflects the projected growth in benefit amounts between generations due to projected growth in economy-wide earnings. That is, a medium earner born in 2020 is expected to have higher scheduled benefits than is a medium earner born in 1960 in nominal terms (hence the y-axes for the 2020 cohort exhibit a wider range of values than the y-axes for the 1960 cohort), although the benefit formula is the same.

An immediate benefit reduction would reduce all current and future beneficiaries' projected monthly benefits in a similar manner. That is, all beneficiaries across the different earnings levels and birth cohorts would experience the same percentage decrease (i.e., 21.3%) in scheduled benefits. In nominal terms, the difference between scheduled and payable benefits would be relatively larger for the hypothetical higher earners, as shown in **Figure 6**. However, the percentage point decline in the effective benefit rate is expected to be greater for lower earners (**Table 5**), a pattern that persists across all birth cohorts. This outcome follows from the progressivity of the benefit formula. That is, absent a benefit reduction, the effective benefit rate for lower earners is greater than for higher earners (e.g., **Table 2** shows that for the 1960 birth cohort, the rate is 40.8% for very low earners and 13.4% for maximum earners). Consequently, in terms of effective benefit rate, a 21.3% benefit reduction is more impactful for lower earners, because the deduction is calculated on a higher base rate.⁵⁴

Table 5 shows that the effective tax rates remained unchanged from **Table 2** (because this scenario does not raise or lower the payroll tax rate paid by workers). However, because effective benefit rates fall for all worker groups in **Table 5**, so do benefit-to-tax ratios in all groups.⁵⁵ For instance, the medium earners born in 1980 would see their benefit-to-tax ratios decrease by 0.42 (-21.3%) under an immediate benefit reduction. Said differently, the lifetime benefits collected versus lifetime taxes paid would be lower for medium earners born in 1980 under this scenario.

The decrease in benefit-to-tax ratios is largely consistent among birth cohorts when accounting for differences in earnings level. The previous example showed the ratio for a medium earner born in 1980 to decrease by 0.42. Similarly, the ratio for a medium earner born in 2000 is estimated to decrease by 0.44. Likewise, a very low earner born in 1980 could expect his or her benefit-to-tax ratio to decrease by 0.82, and a very low earner born in 2000 could expect his or her benefit-to-tax ratio to decrease by 0.85. That is, the point decline in the benefit-to-tax ratio is higher for relatively low earners. Because this scenario would be effective immediately (2023), the percentage change in benefit-to-tax ratios (i.e., 21.3%) would be experienced similarly among workers of different ages and earnings levels.

⁵⁴ That is, 21.3% of 40.8% is 8.7 percentage points, and 21.3% of 13.4% is 2.9 percentage points (see **Table 2**). This is largely caused by the progressivity in the Social Security benefit computation process (see "Scheduled Benefits").

⁵⁵ That is, because the numerator (i.e., total benefits) in each ratio falls, while the denominator (i.e., total taxes paid) remains unchanged.

Table 5. Immediate (2023) Benefit Reduction: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort

Under the 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Benefit Rate					
1960	-8.69 pp	-6.31 pp	-4.68 pp	-3.88 pp	-2.85 pp
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
1980	-9.74 pp	-7.07 pp	-5.24 pp	-4.35 pp	-3.20 pp
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
2000	-10.17 pp	-7.38 pp	-5.47 pp	-4.54 pp	-3.37 pp
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
2020	-10.59 pp	-7.69 pp	-5.69 pp	-4.72 pp	-3.50 pp
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Tax Rate					
1960	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2020	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
Change and Percentage Change (%) in Benefit-to-Tax Ratio					
1960	-0.71	-0.52	-0.38	-0.32	-0.23
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
1980	-0.79	-0.58	-0.43	-0.35	-0.26
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
2000	-0.82	-0.60	-0.44	-0.37	-0.27
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%
2020	-0.85	-0.62	-0.46	-0.38	-0.28
	-21.30%	-21.30%	-21.30%	-21.30%	-21.30%

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume an immediate benefit reduction of 21.3% effective in 2023.

Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

Payroll Tax Rate Increase Effective in 2034 (Scenario 3)

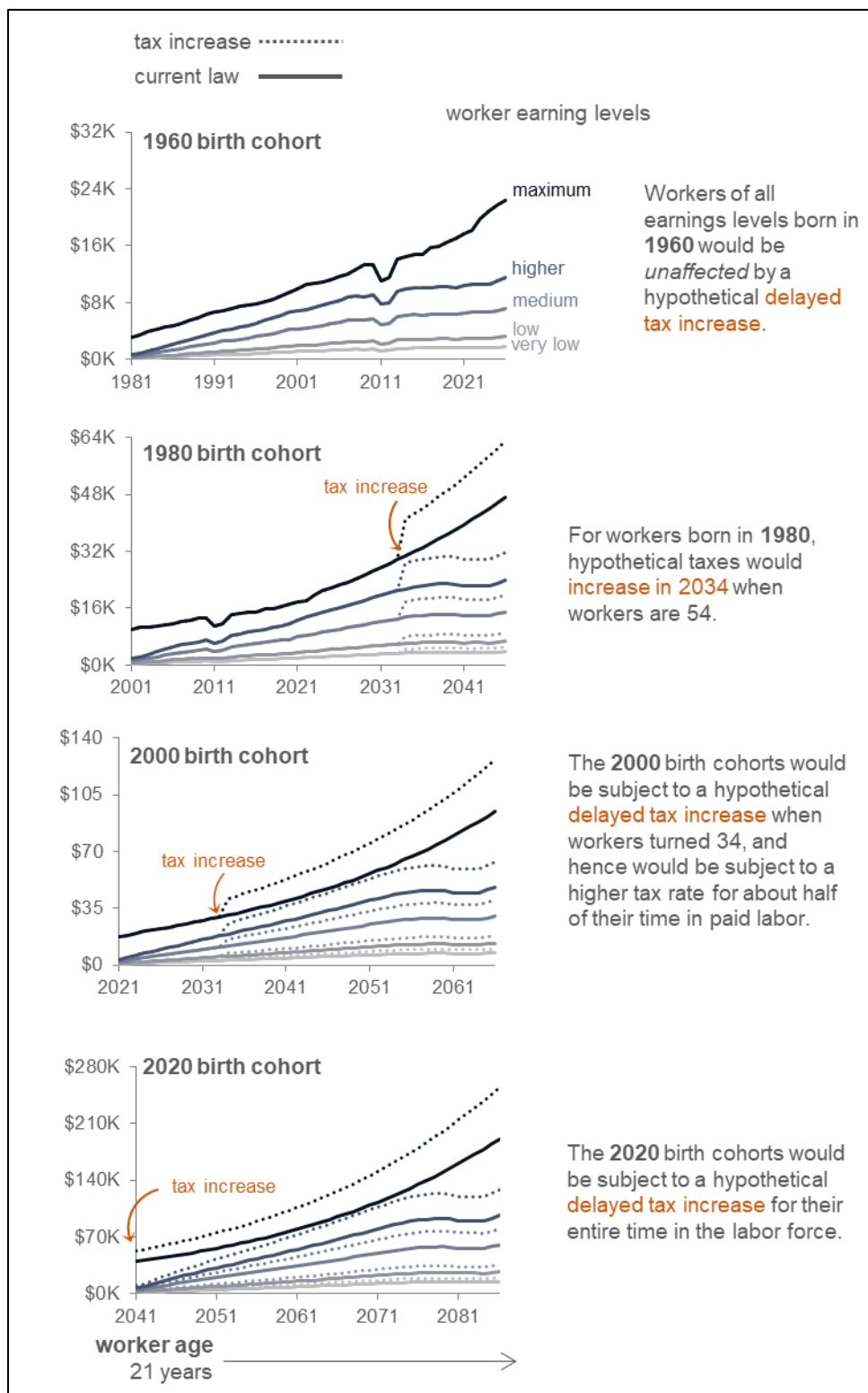
A third hypothetical provision to ensure trust fund solvency—and the payment of full scheduled benefits—throughout the 75-year projection period would be a delayed (2034) increase in the payroll tax rate (see **Table 3**). Under the intermediate assumptions, the trustees estimate that it would require a combined payroll tax rate increase of 4.15 percentage points (with employees and employers each paying a 2.075 percentage point increase). This would increase the combined payroll tax from 12.4% under current law to 16.55%.⁵⁶ Such a change would require congressional action. Dissimilar to the first two scenarios, the effects of a delayed payroll tax rate increase would be shared more *unequally* across the four birth cohorts used in this analysis.

Figure 7 shows how this would affect workers of varying earnings levels and birth cohorts. Similar to an immediate (2023) tax increase, the 1960 birth cohort is unaffected by a delayed tax increase. That birth cohort will turn 75 in 2035 and will likely be collecting benefits as opposed to earning wages subject to the payroll tax. The 1980 birth cohort would be subject to a delayed increase in the payroll tax rate but only for a portion of its time in paid labor. This birth cohort would turn 54 in 2034 and would become eligible for full benefits, at age 67, in 2047. Thus, it would be subject to the payroll tax rate increase for about a 13-year period. The 2000 birth cohort, on the other hand, would be subject to a hypothetical delayed increase in the payroll tax rate for a substantial portion of its estimated time in paid labor. This birth cohort would turn 34 in 2034 and, thus, would still be 33 years from becoming eligible to collect full Social Security benefits. As such, it would be paying a higher effective tax rate for longer than the older birth cohorts. Of the four birth cohorts analyzed in this report, the 2020 birth cohort would see the largest increase in payroll taxes in nominal terms, as it would be subject to the delayed increase for the entirety of its expected time in the paid labor force. This birth cohort would turn 14 at the time of the delayed (2034) hypothetical increase.

⁵⁶ See 2023 Annual Report and Supplemental Single-Year Table IV.B1, <https://www.ssa.gov/OACT/TR/2023/lr4b1.html>.

Figure 7. Annual Combined Payroll Taxes by Earnings Level and Birth Cohort Under Current Law and Delayed (2034) Payroll Tax Increase

In Nominal Dollars



Source: CRS.

Notes: The solid lines represent scheduled combined payroll taxes for hypothetical workers under current law and the 2023 intermediate assumptions. The dotted lines represent projected increase in combined payroll taxes for hypothetical earners that is 4.15 percentage. Under this scenario, the combined payroll tax rate would be 16.55% on covered wages from 2034 through 2097. The x-axes are different for each birth cohort. However, the years correspond to ages 21-66 for each respective cohort (i.e., years of expected participation in the labor force). Additionally, the y-axes display different dollar values. This reflects the growth in economy-wide earnings. That is, given the projected growth in economy-wide earnings, a medium earner born in 2020 is expected to earn roughly 10 times more than is a medium earner born in 1960 in nominal terms. (Hence the y-axes for the 2020 cohort exhibit a wider range of values than the y-axes for the 1960 cohort.) Therefore, younger workers would pay more in total payroll taxes in nominal terms. However, as shown in **Table 2**, all cohorts of workers are subject to the same scheduled payroll tax rate under current law.

As shown in **Table 6**, the effective benefit rates by birth cohort and earnings levels would remain unchanged. The effective tax rates, however, would increase for some but not all birth cohorts. As discussed, a delayed payroll tax rate increase, effective in 2034, would not affect the 1960 birth cohort.⁵⁷ Younger generations would bear at least some additional payroll tax burden but for different portions of their work careers. For instance, as shown in **Table 6**, low earners in the 1980 birth cohort would experience a higher effective tax rate by about 1.40 percentage points (an increase of 11.32%). Although this generation would experience some increase in its effective tax rate under this scenario, it would be less than under an immediate payroll tax rate increase (see **Table 4**). Likewise, the 2000 birth cohort would also experience an increase in its effective tax rate by about 3.45 percentage points (an increase of over 27% for most workers) under a delayed payroll tax rate increase. However, the effective tax rate for this birth cohort is also less than under an immediate (2023) tax rate increase (**Table 4**). Thus, under a delayed payroll tax rate increase scenario, some of the additional tax burden that would have been absorbed by the 1980 and 2000 birth cohorts under an immediate payroll tax rate increase would be *shifted* to the (younger) 2020 birth cohort. As shown in **Table 6**, the 2020 birth cohort's effective tax rate would increase by 4.15 percentage point (an increase of 33.47%) under a delayed increase scenario (higher than under the immediate scenario shown in **Table 4**).

As **Figure 7** and **Table 6** show respective increases in some birth cohorts' payroll taxes and effective tax rates, this would decrease those birth cohorts' benefit-to-tax ratios. As expected, because the 1960 birth cohort was largely unaffected by a delayed payroll tax rate increase, its benefit-to-tax ratio remains unchanged as compared to scheduled amounts. The benefit-to-tax ratio for the 1980 birth cohort, however, would decline relative to the ratio under current policy. For instance, a medium earner born in 1980 could expect the benefit-to-tax ratio to decrease by 0.20 (a decrease of 10.17%) under a delayed payroll tax increase scenario. However, this is a smaller decrease than would occur under an immediate payroll tax increase scenario (a ratio decrease of 0.30 or a percentage decrease of about 15%, as shown in **Table 4**) despite the higher tax rate increase under the delayed implementation scenario. This occurs because the delayed tax rate increase would apply to a sufficiently smaller portion of the 1980 birth cohort's remaining years in paid work. Similarly, the benefit-to-tax ratios for the medium earners of the 2000 birth cohort under a delayed increase scenario would be lower than under current policy but not as low as it would be under an immediate increase scenario.

The effects of delaying a payroll tax increase (i.e., from 2023 to 2034) has the effect of *shifting* the burden to the younger birth cohorts. In this analysis, that younger birth cohort is represented by those born in 2020. As **Table 6** shows, their benefit-to-tax ratios decrease under a delayed scenario *more* than under an immediate tax increase scenario (**Table 4**). For example, **Table 6**

⁵⁷ That is, that birth cohort would not bear any additional tax burden from a payroll tax rate increase, as it would become effective after the cohort had exited paid labor.

shows that under a delayed tax increase scenario, a medium earner in the 2020 cohort would see his or her benefit-to-tax ratio decrease by 0.54 (a decrease of 25.08%), whereas under an immediate tax increase scenario, the decrease in the benefit-to-tax ratio would have been 0.47 (a decrease of 21.72%).

Table 6. Delayed (2034) Payroll Tax Increase: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort

Under the 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Benefit Rate					
1960	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2020	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Tax Rate					
1960	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	1.40 pp	1.40 pp	1.40 pp	1.40 pp	1.38 pp
	11.32%	11.32%	11.32%	11.32%	11.16%
2000	3.45 pp	3.45 pp	3.45 pp	3.45 pp	3.19 pp
	27.85%	27.85%	27.85%	27.85%	25.71%
2020	4.15 pp	4.15 pp	4.15 pp	4.15 pp	4.15 pp
	33.47%	33.47%	33.47%	33.47%	33.47%
Change and Percentage Change (%) in Benefit-to-Tax Ratio					
1960	0.00	0.00	0.00	0.00	0.00
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	-0.38	-0.28	-0.21	-0.17	-0.12
	-10.17%	-10.17%	-10.17%	-10.17%	-10.04%
2000	-0.84	-0.61	-0.45	-0.37	-0.26
	-21.78%	-21.78%	-21.78%	-21.78%	-20.45%
2020	-1.01	-0.73	-0.54	-0.45	-0.33
	-25.08%	-25.08%	-25.08%	-25.08%	-25.08%

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume scheduled benefits paid under intermediate assumptions and current law and a payroll tax rate increase of 4.15 percentage points from 2034 through 2097.

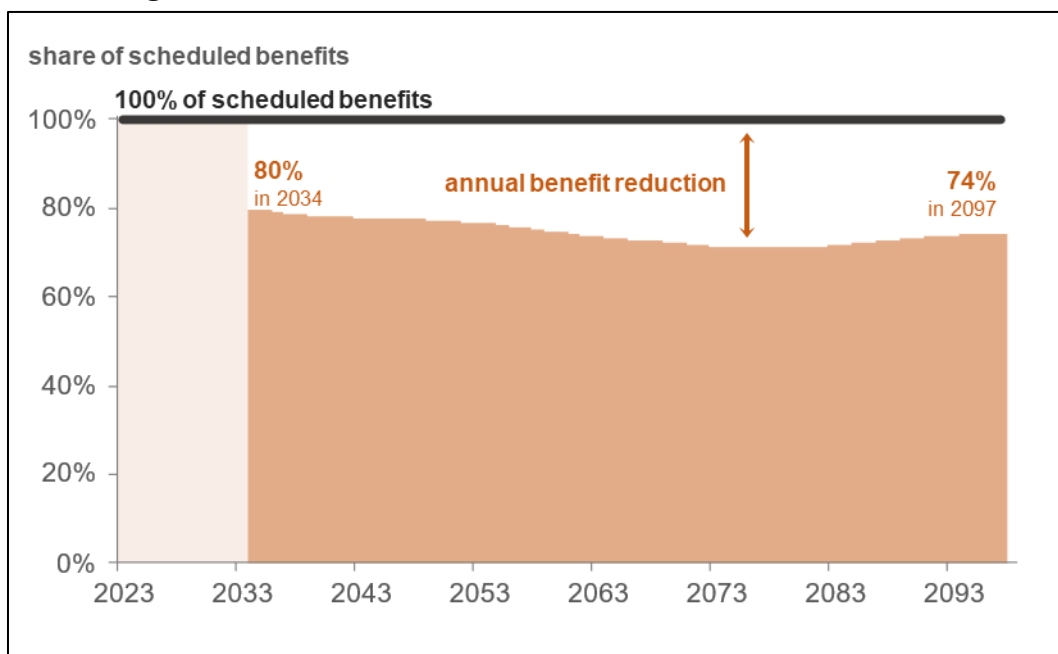
Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

Benefit Reduction Effective in 2034 (Scenario 4)

The fourth hypothetical provision put forward in annual reports is a delayed benefit reduction (i.e., benefit cut). The trustees estimate that, if effective in 2034, it would take a benefit reduction of about 25% to ensure trust fund solvency throughout the 75-year projection period. This scenario is commonly referred to as the “no-action” scenario. Whereas the previous three hypothetical scenarios analyzed in this report would require congressional action, this one would not require Congress to do anything. That is, at the projected date of trust fund depletion (2034) and absent any changes to current law, total benefits payable will necessarily become equal to continuing tax revenues.⁵⁸ At the time of depletion, with no more trust fund assets to redeem or interest income, tax revenues are projected to support a level of benefits lower than what is scheduled under current law.

The estimated benefit reduction of 25% is the average benefit reduction over the remainder of the 75-year projection period (2034-2097) that would ensure trust fund solvency. The percent of benefits that may be supported by ongoing program revenues—payable benefits—may change from year to year. Said differently, the system could be balanced by raising and lowering the benefit reduction each year. (This would essentially be a fluctuating benefit reduction in each year based on the level of projected, continuing program revenues.) As shown in **Figure 8**, the program is projected to have sufficient funds to pay 80% of benefits in 2034, and this percentage would drop to 74% by 2097. Thus, the benefit reduction rate as projected by OCACT would range between 20% and 26% between 2034 and 2097, with an average rate of benefits reduction of approximately 25% over the time period. Under the trustees’ intermediate assumptions, the maximum benefit reduction under current law would be about 29% in the years 2076-2079.

⁵⁸ For more information, see CRS Report RL33514, *Social Security: What Would Happen If the Trust Funds Ran Out?*

Figure 8. Benefits as a Share of Scheduled Benefits, 2023-2097

Source: CRS, based on an OCACT memorandum from Daniel Nickerson, actuary, and Kyle Burkhalter, actuary, to Chris Chaplain, supervisory actuary, and Karen Glenn, deputy chief actuary, “Current-Law OASDI Payable Percentages: Current-Law Revenue as a Percent of the Cost of Providing Scheduled Benefits Through Year 2097—Information,” April 18, 2023.

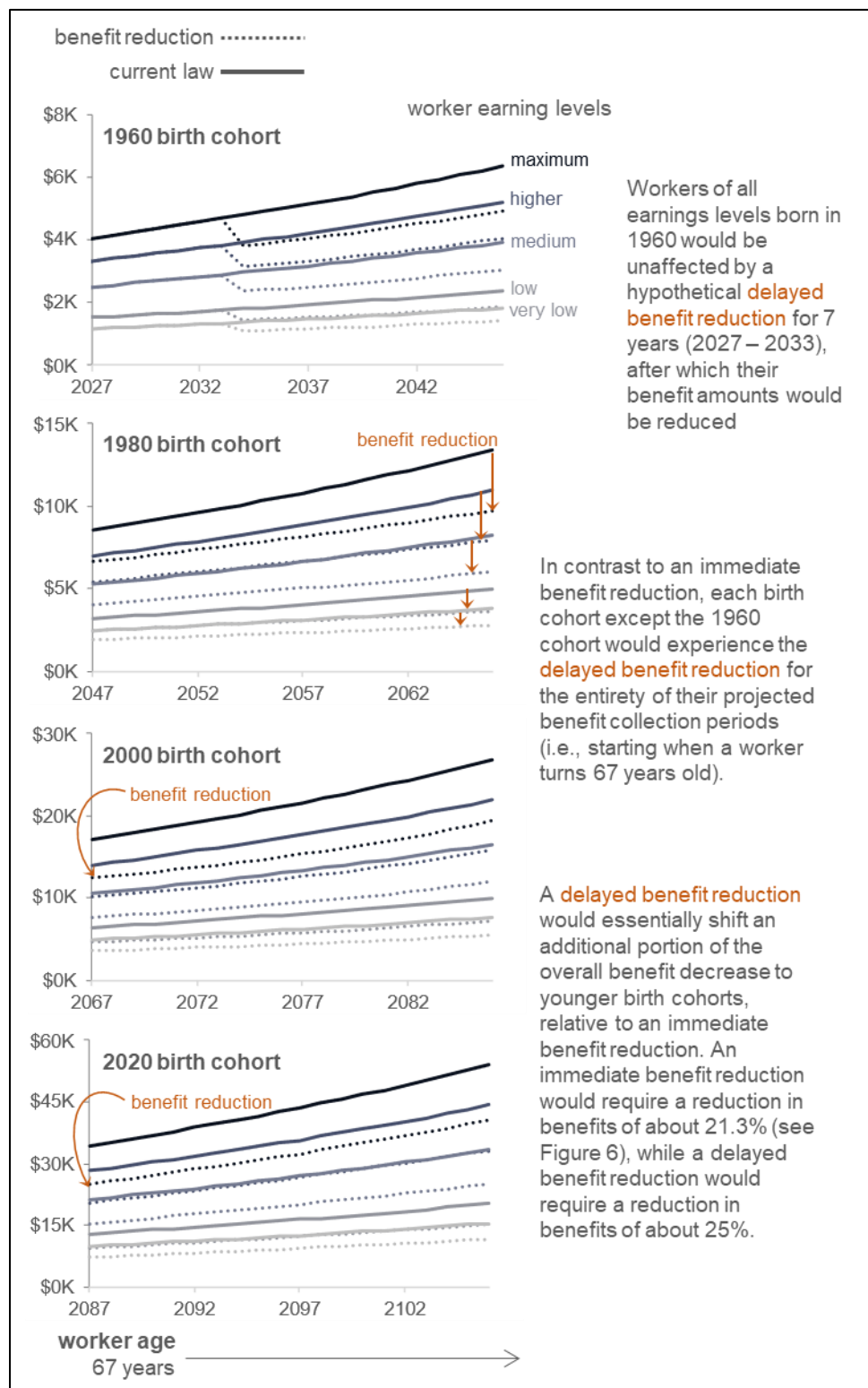
Notes: Projections are based on the trustees’ 2023 intermediate assumptions. In calculating the share of payable benefits, OCACT limits revenue from the taxation of benefits to the amount that would be obtained from the payable benefits.

Whereas an immediate benefit reduction would require a reduction in benefits of about 21.3% (see “Immediate Benefit Reduction Effective in 2023 (Scenario 2)”), a delayed benefit reduction would require an average reduction in benefits by about 25%. Similar to the tax increase hypothetical scenarios, a delayed benefit reduction would essentially shift an additional portion of the overall benefit decrease to younger birth cohorts relative to an immediate benefit reduction.

Figure 9 shows that the 1960 birth cohort would be spared some of the benefit reduction that would become effective in 2034, because this group would start claiming benefits in 2027 and thus would receive seven years of full scheduled benefits prior to projected trust fund depletion. Workers in all other cohorts, however, would experience the benefit reduction in each year in which they receive benefits. Thus, a delayed benefit cut would be shared *less* equally across birth cohorts than would an immediate (2023) benefit cut as shown in **Figure 6**.

Figure 9. Monthly Benefits by Earnings Level and Birth Cohort Under Current Law and Delayed (2034) Benefit Decrease

In Nominal Dollars



Source: CRS.

Notes: The solid lines represent scheduled monthly benefits for hypothetical workers under current law and the 2023 intermediate assumptions. The dotted lines represent projected monthly benefits for hypothetical earners under a delayed benefit reduction scenario. The average benefit reduction during the 2035-2096 period would be about 25%. The x-axes are different for each birth cohort. However, the years correspond to ages 67-87 for each respective cohort (i.e., years of expected benefit collection). Additionally, the y-axes display different dollar values. This reflects the projected growth in benefit amounts between generations due to projected growth in economy-wide earnings. That is, a medium earner born in 2020 is expected to have higher scheduled benefits than is a medium earner born in 1960 in nominal terms (hence the y-axes for the 2020 cohort exhibit a wider range of values than the y-axes do for the 1960 cohort), although the benefit formula is the same.

Table 7 presents the estimated changes in the effective benefit rates, effective tax rates, and benefit-to-tax ratios that would result from a delayed (2034) benefit reduction. These estimates show that a delayed benefit reduction would affect all four birth cohorts analyzed in this report but not equally. In particular, the decrease in the effective benefit rates would be more pronounced in younger generations. For instance, a medium earner in the 1960 birth cohort could expect a decrease in the effective benefit rate of 3.01 percentage points (-13.73%), whereas medium earners in the later birth cohorts could expect decreases of 6.05 percentage points (-24.58%; 1980 cohort), 7.27 percentage points (-28.32%; 2000 cohort), and 6.87 percentage points (-25.70%; 2020 cohort). In percentage terms, workers in the 1960 birth cohort would experience about a 14% loss in its effective benefit rates, as this cohort has a shorter expected period of being affected by a delayed benefit reduction, whereas the other groups would experience larger reductions of at least 24%, as they are expected to experience a delayed benefit reduction for the entirety of their benefit collection period. The 2020 birth cohort is estimated to experience a smaller reduction, in each earnings profile, than the 2000 cohort is. This characteristic results from a smaller estimated benefit reduction starting in the late 2070s (see **Figure 8**) as well as increased life expectancy (i.e., projected longer period of benefit collection).

The same patterns are reflected in the estimated changes to the benefit-to-tax ratios (**Table 7**). That is, each birth cohort would experience losses in its respective ratios, but such losses would be greater for the younger birth cohorts as they are expected to experience the effects of a delayed benefit reduction for all of their projected benefit collection periods. Within cohorts, ratio losses are greater for lower earners and smaller for higher earners. That is, the percentage point decline in the benefit-to-tax ratio is higher for relatively low earners and is reflective of the progressivity of the current-law benefit formula. In percentage terms, however, the decline in benefit-to-tax ratio would be the same for all worker profiles within the same birth cohort (i.e., about a 14% loss for all worker profiles in the 1960 cohort and at least 24% for all worker profiles in the other birth cohorts).

Table 7. Delayed (2034) Benefit Reduction: Change and Percentage Change in Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort

Under the 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Benefit Rate					
1960	-5.60 pp	-4.07 pp	-3.01 pp	-2.50 pp	-1.84 pp
	-13.73%	-13.73%	-13.73%	-13.73%	-13.73%
1980	-11.25 pp	-8.16 pp	-6.05 pp	-5.02 pp	-3.69 pp
	-24.58%	-24.58%	-24.58%	-24.58%	-24.58%
2000	-13.52 pp	-9.82 pp	-7.27 pp	-6.03 pp	-4.48 pp
	-28.32%	-28.32%	-28.32%	-28.32%	-28.32%
2020	-12.77 pp	-9.27 pp	-6.87 pp	-5.70 pp	-4.22 pp
	-25.70%	-25.70%	-25.70%	-25.70%	-25.70%
Change (in Percentage Points [pp]) and Percentage Change (%) in Effective Tax Rate					
1960	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
2020	0.00 pp	0.00 pp	0.00 pp	0.00 pp	0.00 pp
	0.00%	0.00%	0.00%	0.00%	0.00%
Change and Percentage Change (%) in Benefit-to-Tax Ratio					
1960	-0.46	-0.33	-0.25	-0.21	-0.15
	-13.73%	-13.73%	-13.73%	-13.73%	-13.73%
1980	-0.91	-0.66	-0.49	-0.41	-0.30
	-24.58%	-24.58%	-24.58%	-24.58%	-24.58%
2000	-1.09	-0.79	-0.59	-0.49	-0.36
	-28.32%	-28.32%	-28.32%	-28.32%	-28.32%
2020	-1.03	-0.75	-0.55	-0.46	-0.34
	-25.70%	-25.70%	-25.70%	-25.70%	-25.70%

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume a delayed benefit reduction that averages 25% through the 2034-2097 period.

Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

Comparison of the Hypothetical Scenarios

Table 8 presents a side-by-side comparison of the effects of the four hypothetical scenarios examined in this report. The table shows the change in the benefit-to-tax ratios by worker profile and birth cohorts under these scenarios, using the amounts scheduled under current law and the 2023 intermediate assumptions as a baseline. The table also includes the range of changes by worker profile and birth cohorts for each of the four hypothetical scenarios. The *range*—maximum less minimum—is a simple measure of dispersion of a small set of data (i.e., the smaller the range, the more clustered the set of data). In this context, a lower range would suggest that a given policy change results in less disparate changes in benefit-to-tax ratios from their scheduled amounts across cohorts or earner profiles.

The hypothetical scenario that would on average lead to the least amount of change to the benefit-to-tax ratios across the earner profiles and cohorts examined is the delayed payroll tax increase (a ratio decrease of 0.34, on average),⁵⁹ followed by the immediate payroll tax increase (a ratio decrease of 0.35 change, on average). **Table 8** shows, however, that the hypothetical change with the lowest overall range for changes in the benefit-to-tax ratios is that for the immediate benefit reduction (0.62, overall range). This suggests that the impact of an immediate benefit reduction—measured by change in benefit-to-tax ratios—is less dispersed (more similar) across earnings levels and birth cohorts relative to the other scenarios. The immediate benefit reduction is also expected to have the lowest range in benefit-to-tax ratio changes for each earner profile (e.g., medium earners of different birth cohorts experience similar absolute decreases in their benefit-to-tax ratios). That is, the changes resulting from an immediate benefit reduction across cohorts within a given earnings profile are more closely clustered around the mean change for that profile than they would be if another policy change were adopted. One could argue that among the hypothetical changes discussed in this report, an immediate benefit reduction may present the most *generationally equal* option and seems to reinforce the trustees’ statement that “[i]mplementing changes sooner rather than later would allow more generations to share in the needed revenue increases or reductions in scheduled benefits.”⁶⁰

Table 8 shows that the hypothetical policy change with the highest overall range for changes in the benefit-to-tax ratios is a delayed payroll tax rate increase (1.01). As discussed earlier, this hypothetical policy change would leave the 1960 birth cohort least affected in both taxes paid and benefits received. This cohort would be 75 at the time of a delayed payroll tax rate increase (2034) and well past the age of benefit eligibility. Similarly, this hypothetical scenario demonstrates the highest range across earnings profiles. This implies that the five profiles of earners are affected in a more disparate manner under this change than under the other three hypothetical scenarios. This reflects the fact that this option would *shift* and *increase* the burden of a tax rate increase on to younger generations while leaving some beneficiaries in the older generations largely unaffected. Thus, one could argue that among the hypothetical changes discussed in this report, a delayed payroll tax rate increase may present the most *generationally unequal* option. For instance, under a hypothetical delayed payroll tax rate increase, a very low earner born in 1960 is calculated to have no change in his or her benefit-to-tax ratio, whereas a similar worker born in 2020 is calculated to experience a decrease of 1.01 points in his or her

⁵⁹ The average is calculated as the mean of the 20 changes in benefit-to-tax ratio for the given policy change. The low average value for the delayed payroll tax increase scenario is due in part to *no change* (0 percentage point change) for the 1960 cohort. When averages are calculated with the 1960 cohort removed, the average change increases for each scenario, but the ranking of average changes is preserved. That is, among the 1980, 2000, and 2020 cohorts, the delayed payroll tax increase scenario has the smallest average change, followed by an immediate payroll tax increase.

⁶⁰ 2023 Annual Report, p. 6.

benefit-to-tax ratio (the second largest decrease across all earnings levels and birth cohorts among the four scenarios in **Table 8**).

Table 8. Change in Benefit-to-Tax Ratios from Scheduled Amounts for Hypothetical Earners, by Birth Cohorts

Under the 2023 Intermediate Assumptions

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner	Range
Immediate Payroll Tax Increase (Change in Benefit-to-Tax Ratio from Table 4)						
1960	-0.08	-0.06	-0.04	-0.04	-0.03	0.05
1980	-0.56	-0.41	-0.30	-0.25	-0.17	0.39
2000	-0.83	-0.60	-0.45	-0.37	-0.27	0.56
2020	-0.87	-0.63	-0.47	-0.39	-0.29	0.58
Range	0.79	0.57	0.42	0.35	0.26	0.84 ^a
Immediate Benefit Reduction (Change in Benefit-to-Tax Ratio from Table 5)						
1960	-0.72	-0.52	-0.39	-0.32	-0.24	0.48
1980	-0.79	-0.58	-0.43	-0.35	-0.26	0.53
2000	-0.82	-0.60	-0.44	-0.37	-0.27	0.55
2020	-0.85	-0.62	-0.46	-0.38	-0.28	0.57
Range	0.13	0.10	0.07	0.06	0.05	0.62 ^a
Delayed Payroll Tax Increase (Change in Benefit-to-Tax Ratio from Table 6)						
1960	0.00	0.00	0.00	0.00	0.00	0.00
1980	-0.38	-0.28	-0.21	-0.17	-0.12	0.26
2000	-0.84	-0.61	-0.45	-0.37	-0.26	0.58
2020	-1.01	-0.73	-0.54	-0.45	-0.33	0.67
Range	1.01	0.73	0.54	0.45	0.33	1.01 ^a
Delayed Benefit Reduction (Change in Benefit-to-Tax Ratio from Table 7)						
1960	-0.46	-0.34	-0.25	-0.21	-0.15	0.31
1980	-0.92	-0.67	-0.49	-0.41	-0.30	0.62
2000	-1.09	-0.79	-0.59	-0.49	-0.36	0.73
2020	-1.03	-0.75	-0.55	-0.46	-0.34	0.69
Range	0.63	0.45	0.34	0.28	0.21	0.94 ^a

Source: CRS calculations based on hypothetical earner profiles developed by OCACT.

Notes: The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid. Total benefits received and total taxes paid were indexed to 2022 dollars.

- a. This value represents the range (i.e., maximum less minimum) of the 20 changes in benefit-to-tax ratios (five earnings profiles by four birth cohorts). For example, the change in the benefit-to-tax ratio under the immediate payroll tax increase scenario has an overall range of 0.84, which equals -0.87 (maximum overall change) minus -0.03 (minimum overall change).

Conclusion

If lawmakers choose to address the projected Social Security shortfall, they have a wide range of policy options. This report analyzes four hypothetical scenarios that the trustees estimate would eliminate the projected financial shortfall. Of these four scenarios, delayed action—either related to payroll taxes or benefit amounts—generally concentrates the effects of policy change on younger generations. This suggests that workers in younger generations would be likely to experience larger payroll tax rate increases or benefit reductions under either delayed scenario than they would under either immediate scenario. That is, certain policy options would result in less *generational equity* than would others. However, workers in older cohorts may be less able to change behaviors (e.g., work or savings) in response to policy changes.

The scenarios analyzed in this report were chosen for illustrative purposes. Lawmakers do not have to choose only revenue-increasing measures *or* only cost-reducing measures. For instance, lawmakers could propose a smaller payroll tax rate increase (i.e., less than those analyzed in this report) along with a cost-reducing provision (e.g., a decrease in future COLA payments) in order to achieve trust fund solvency throughout the 75-year projection period. That is, both a benefit reduction and a payroll tax increase could be part of a larger policy solution as proposed by the trustees. In addition, there is a wide range of revenue-increasing measures (e.g., raising or eliminating the cap on earnings subject to the payroll tax) and cost-reducing measures (e.g., lowering COLAs or increasing the FRA) that lawmakers can consider.

Lastly, lawmakers could address a “portion” of the projected financial shortfall. For instance, in the 2023 Annual Report, the trustees estimated that an immediate payroll tax rate increase of 3.44 percentage points would be needed to maintain trust fund solvency. Lawmakers also have the option to implement a smaller increase (e.g., 2.0 percentage point). Such a policy change would extend solvency beyond 2034 but not throughout the 75-year projection period. Additionally, at the point of trust fund exhaustion, this smaller payroll tax rate increase would provide for a higher percentage of payable benefits. Similarly, policy options exist that would result in smaller benefit reductions than would the hypothetical scenarios analyzed in this report (e.g., reducing the annual COLA by one percentage point).

Appendix. Estimated Characteristics of Hypothetical Worker Profiles and Discount Rates

Estimated Characteristics of Hypothetical Worker Profiles

This report examines how changes in payable benefits and payroll taxes would affect the effective benefit rates, effective tax rates, and benefit-to-tax ratios for a set of SSA-defined *hypothetical earners* in selected birth cohorts.⁶¹ This appendix examines hypothetical earners' demographic and other characteristics based on an SSA analysis of administrative records and a CRS analysis of cross-sectional data from the 2021 American Community Survey (ACS), a large-scale nationally representative household survey. These analyses reveal that some demographic groups are more concentrated in lower earner categories and others in higher earner categories, suggesting that the effects of certain benefit formula changes may not be experienced uniformly by workers with a different gender, race, or ethnicity.

Gender Distribution of Retiring Workers Relative to SSA's Hypothetical Earner Profiles

SSA publishes the distribution of women and men retiring in the 2017-2022 period relative to its hypothetical earner profiles (**Table A-1**) based on data for *actual workers* from a sample of Social Security administrative records.⁶² In the SSA analysis, the hypothetical medium-earning worker retiring at age 62 in 2022 had career-average annual earnings of \$60,274 (in 2021 dollars). Of actual workers retiring in the 2017-2022 period, 56.1% had AIMEs less than that of the hypothetical medium earner.

The SSA analysis indicates that, of workers retiring in the 2017-2022 period, greater shares of women than men had AIMEs that were lower than the AIMEs of each of the five SSA hypothetical earner profiles. For example, among actual workers retiring in the 2017-2022 period, 69.7% of women and 42.6% of men had AIMEs less than the hypothetical medium earner. This might suggest that benefit formula changes that would reduce benefits for lower earners relatively more so than for higher earners may have implications for the gender gap in income security during retirement.

⁶¹ As discussed in the "Hypothetical Earners" section of the report, initial values for these amounts and rates (i.e., before benefit formula changes) and their values under various scenarios considered in the report are based on the estimated career earnings profiles of hypothetical earners using SSA-developed methods. The SSA hypothetical earner profiles are created such that selected career-average estimated earnings are 25%, 45%, 100%, and 160% of AWI in the year prior to entitlement for very low, low, medium, and high earners, respectively. A fifth category of hypothetical earner (maximum hypothetical earner) is assumed to earn at least the taxable maximum in each year from age 21 to age 64.

⁶² Specifically, the data describe actual workers who retired in 2017-2022 and are from a 1% sample of Social Security administrative records.

Table A-1. Distribution of Average-Indexed Monthly Earnings (AIMEs) of Actual Workers Retiring in Years 2017-2022, Relative to AIMEs for Hypothetical Workers Retiring in 2022

Percent with AIME Less Than AIME for Hypothetical Case	Hypothetical Worker ^a (Career-Average Earnings Per Year) ^b				
	Very Low (\$15,068)	Low (\$27,123)	Medium (\$60,274)	High (\$96,438)	Maximum (\$149,006)
All Males	7.8%	16.3%	42.6%	71.5%	100.0%
All Females	15.1%	31.1%	69.7%	90.7%	100.0%
All Workers	11.4%	23.6%	56.1%	81.0%	100.0%

Source: OCACT, *Scaled Factors for Hypothetical Earnings Examples Under the 2023 Trustees Report Assumptions*, March 2023, Table 1, <https://www.ssa.gov/OACT/NOTES/ran3/an2023-3.pdf>.

Notes: Worker distributions include individuals who are dually entitled or may become dually entitled to higher benefits in the future based on other workers' earnings records. For more information on dual entitlement, see CRS In Focus IF10738, *Social Security Dual Entitlement*.

- A hypothetical worker is assumed to have a career with long and consistent earnings from age 21 through age 64.
- Career-average earnings per year are for hypothetical workers retiring at age 62 in 2022. Earnings are wage-indexed to 2021 dollars in this calculation.

CRS Estimates of Hypothetical Earner Characteristics in 2021

This section expands upon the SSA analysis of earners' characteristics (i.e., distribution of workers by gender as shown in **Table A-1**) to examine additional demographic and other information using data from the 2021 ACS. In addition to demographic data (e.g., age, gender, race), ACS data contains information on employment (e.g., employment status, usual weekly hours, annual weeks of work, and annual earnings) and family characteristics (e.g., poverty status). The 2021 ACS data are used to describe the distribution of workers in that year over a set of hypothetical earner groups defined in terms of the SSA hypothetical earner profiles and the characteristics of workers within those earner groups.⁶³

The CRS analysis of hypothetical workers in ACS data is not directly comparable to the SSA analysis of retiring workers in its administrative records. The CRS analysis uses SSA-defined parameters and concepts to sort workers in the ACS data into hypothetical worker groups but uses a different type of data and different sample criteria. Notably, ACS data are cross-sectional—that is, workers of different ages are observed in only one year, whereas SSA had access to workers' career earnings (i.e., earnings over multiple years for the same workers). SSA compared career-average earnings of retiring workers to career-average earnings of hypothetical workers. CRS does not have access to such longitudinal data and instead assigns workers between the ages of 25 and 62 to SSA hypothetical earner categories using SSA's age-specific scaling factors. For example, based on SSA methods, a worker who is age 25 in 2021 with annual earnings of about \$8,965 would be categorized as a very low earner, whereas a 25-year-old worker with earnings of

⁶³ Census Bureau information about the ACS is at <https://www.census.gov/programs-surveys/acs/about.html>. CRS used the public use microdata sample data, which includes a subsample (approximately two-thirds of responses collected in a given calendar year) of the full ACS microdata. The ACS public use files contain information from about 1% of the U.S. population in each survey year. CRS downloaded selected variables from the public use microdata sample from the IPUMS-USA database on March 20, 2023. For more information, see Steven Ruggles et al., IPUMS USA: Version 13.0 [dataset]. IPUMS, 2023, <https://doi.org/10.18128/D010.V13.0>.

\$57,546 would be categorized as a high earner. A worker who is age 46 in 2021 with annual earnings of about \$16,537 would be categorized as a very low earner, whereas a 46-year-old worker with annual earnings of \$105,703 would be categorized as a high earner.⁶⁴ A potential drawback of these methods is that they overlook the potential for workers to “jump” career paths, such that a worker who meets the SSA threshold for a very low earner (or high earner) at age 25 in 2021 may over time increase (or decrease) earnings such that he or she would be moved to a higher (or lower) hypothetical earner category as his or her career progresses.

In addition, SSA data contains information on *covered earnings*, while ACS data describe wage and salary income, a potentially broader concept.⁶⁵ CRS analysis is limited to persons between the ages of 25 and 62 who were employed at the time of the survey and reported earnings in the 12 months preceding the survey interview.⁶⁶

Despite data differences, the overall distribution of workers and the distribution of employed men and women in 2021 (**Table A-2**, based on ACS data) is similar to those calculated by SSA based on administrative records for workers retiring in the 2016-2021 period.⁶⁷ In particular, ACS data indicate that larger shares of men than women were in the higher earnings groups in 2021, and larger shares of women than men were in the lower earnings groups in that year. For example, 67.1% of women and 52.4% of men had earnings less than the hypothetical medium earner for their ages. The distribution of workers also varied by race, Hispanic ethnicity, and educational attainment. For example, higher shares of White, Asian, and non-Hispanic workers were in the top earner groups than were Black and Hispanic workers. About 29% of Black workers had earnings at or above the medium earner threshold, whereas about 53% of Asian workers and 45% of White workers had earnings in the top earnings groups. About 44% of non-Hispanic workers and 27% of Hispanic workers were in the top two earner groups in 2021. Workers who had completed at least a bachelor’s degree (61%) were considerably more concentrated in the higher earner categories relative to those without bachelor’s degrees (26%).

⁶⁴ A 25-year-old worker who had \$57,546 in annual earnings in 2021 would be categorized as a high earner, whereas a 46-year-old worker with the same annual earnings would be categorized as a medium earner.

⁶⁵ ACS wage and salary income includes wages, salary, Armed Forces pay, commissions, tips, piece-rate payments, and cash bonuses earned before deductions (e.g., for taxes, pensions, union dues). Census Bureau, *ACS 2021 Subject Definitions*, https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2021_ACSSubjectDefinitions.pdf.

⁶⁶ Workers younger than age 25 are not included because CRS analysis includes the distribution of workers by highest level of educational attainment. Age 25 was selected as a cutoff to allow the distribution of workers with bachelor’s degrees to include those old enough to complete a bachelor’s degree.

⁶⁷ As a sensitivity check, CRS limited analysis to workers in the ACS sample who were ages 57-62 at the time of the interview and calculated their distribution relative to the SSA hypothetical earner profiles. The relative patterns were similar to those produced by analysis of the full ACS sample: Women were more concentrated in the lower earning group than were men. For example, in the restricted sample, 12.3% of women and 6.5% of men were in the very low earner group, and 85.1% of women and 70.1% of men had earnings at or below the high earner threshold (i.e., 14.9% of women and 29.9% of men had earnings above the high earner threshold). As in the full sample, higher shares of White, Asian, and non-Hispanic workers were in the top earner groups than were Black and Hispanic workers, and workers who had completed at least a bachelor’s degree were more concentrated in the higher earner groups relative to those without bachelor’s degrees.

Table A-2. Cumulative Distribution of Selected Worker Groups Relative to SSA Hypothetical Earner Profiles in 2021

Percent of Workers with Earnings At or Below Each Hypothetical Earner Profile Threshold

		Hypothetical Earner Profile				
		Very Low	Low	Medium	High	Maximum
Overall		9.8%	20.9%	59.3%	82.1%	100.0%
Gender						
	Female	12.9%	26.8%	67.1%	87.6%	100.0%
	Male	7.1%	15.8%	52.4%	77.2%	100.0%
Ethnicity/Race						
	Black	12.7%	26.9%	71.5%	90.8%	100.0%
	Asian	9.9%	19.4%	47.5%	69.0%	100.0%
	White	8.4%	17.7%	54.6%	79.6%	100.0%
	Non-Hispanic	9.2%	19.2%	56.4%	80.3%	100.0%
	Hispanic	12.6%	29.1%	73.0%	90.7%	100.0%
Education						
	Less Than a Bachelor's Degree	12.7%	28.0%	74.4%	92.7%	100.0%
	Bachelor's Degree or Higher Level of Educational Attainment	5.9%	11.4%	38.9%	67.8%	100.0%

Source: CRS calculations using ACS data. Hypothetical earnings groups are defined by applying age-specific SSA scaled factors to the AWT in 2021 (\$55,628.60).

Notes: Percentages describe the share of worker groups with earnings at or below each hypothetical earner earnings threshold. All workers with earnings above the maximum (taxable) earnings level of \$142,800 (2021 dollars) are included in the maximum earner category. The sample comprises individuals who were ages 25-62, were employed at the time of the survey, and reported wage and salary earnings over the 12 months that preceded the survey interview.

Table A-2 presents the estimated share of workers below each hypothetical worker earnings profile threshold. In contrast, **Table A-3** presents estimated characteristics of workers in 2021 within categories bounded by hypothetical worker profile thresholds. For example, the table shows that in 2021 the average age of workers in the *very low* earner category is 43 years, 13% of workers in the *medium* earner category were Black, and the median household income for workers in the *high* earner category was \$120,000. Worker earner categories in this table are non-overlapping. The earnings span for each category is bounded above by the age-specific earnings threshold for the given category and bounded below by the earnings threshold for the next lower category. (For example, workers are placed in the low earner category if they reported earnings of at least \$1 above the age-specific earnings for the *very low* earner category and earnings of no more than the age-specific earnings threshold for the *low* earner category.) The table includes one additional hypothetical earner category called *maximum plus*, which contains workers with earnings above the taxable maximum.

When compared to all workers in the sample (last column in **Table A-3**), a relatively high share of women, Black workers, and Hispanic workers are in the lowest earnings categories. For example, women comprised 47% of the full sample but 62% of workers in the *very low* earner

category. Similarly, a relatively high share of workers without bachelor's degrees are in the lowest earnings categories. Workers in lower earnings categories had lower work hours and were more likely to work less than 27 weeks per year than were workers in the higher earnings category.⁶⁸ Workers in the highest earnings categories were predominantly covered by health insurance policies offered by employers or unions, whereas such coverage rates for lower earners were below the overall rate. Lower earners were in households and families with lower incomes and greater use of public assistance and were more likely to reside in non-metro areas.

Table A-3. Selected Characteristics of Workers in 2021 within Hypothetical Earners Categories

	Hypothetical Earner Categories						Total
	Very Low	Low	Medium	High	Maximum	Maximum Plus	
Demographic and Characteristics							
Mean age (in years)	43	43	42	42	42	46	43
Share of workers who are:							
Female	62%	59%	50%	43%	36%	28%	47%
White	53%	52%	60%	68%	70%	72%	62%
Black	15%	15%	13%	10%	7%	5%	12%
Hispanic (can be of any race)	23%	27%	21%	14%	11%	8%	18%
Married	49%	49%	54%	62%	64%	78%	58%
Educational attainment (share of workers)							
Less than a bachelor's degree	75%	79%	70%	46%	28%	16%	58%
Bachelor's degree or higher	25%	21%	30%	54%	72%	84%	42%
Employment Characteristics							
Mean usual hours worked per week	29	37	41	44	45	47	41
Weeks worked in the past 12 months (share of workers)							
1 to 26 weeks	37%	9%	3%	1%	1%	1%	6%
27 to 52 weeks	63%	91%	97%	99%	99%	99%	94%
Health insurance coverage through an employer or union	45%	54%	75%	87%	90%	91%	75%

⁶⁸ The data suggest that a significant group of workers who are retired from career jobs but working in bridge employment in 2021 may be in the very low earners groups. For example, this earner group reported higher average retirement earnings than those in the low earners group. This may also partially explain why workers in the very low earner group had higher shares of college degree holders than workers in the low earners group did.

	Hypothetical Earner Categories						Total
	Very Low	Low	Medium	High	Maximum	Maximum Plus	
Household Characteristics, Family Characteristics, and Resources							
Median individual wage and salary income	\$8,000	\$20,000	\$40,000	\$73,000	\$110,000	\$200,000	\$50,000
Median total household income	\$51,100	\$59,100	\$83,800	\$120,000	\$161,000	\$280,000	\$101,800
Share of workers							
Family income within 200% of the poverty threshold	55%	46%	12%	1%	0%	0%	15%
Family receives Supplemental Nutrition Assistance Program benefits	22%	18%	10%	4%	3%	2%	10%
Resides in non-metro area	8%	9%	8%	6%	4%	3%	7%
Estimated population (in thousands)	11,472	13,013	44,859	26,637	12,228	8,680	116,889
Estimated share of the population of earners	9.8%	11.1%	38.4%	22.8%	10.5%	7.4%	100.0%

Source: CRS calculations using ACS data. Hypothetical earnings categories are defined by applying age-specific SSA scaled factors to the AWI in 2021 (\$55,628.60).

Notes: Earnings categories are mutually exclusive and are bounded from above by the age-specific income level used to define the SSA hypothetical earner profiles and below by the age-specific income level (plus one dollar) used to define the next lowest hypothetical earner profile.

Discount Rates

A *money's worth* measure is used to answer whether an individual is receiving something that is worth the cost he or she has experienced. There are many types of money's worth measures: payback period, lifetime transfer, internal rate of return, and benefit-to-tax ratio. This report utilized the benefit-to-tax ratio, which compares the total lifetime value of a worker's Social Security benefits with the total lifetime value of his or her Social Security taxes.⁶⁹

More specifically, in the context of this report, benefit-to-tax ratio is the ratio of the *present value* of expected benefits to the *present value* of expected payroll taxes (i.e., contributions).⁷⁰ That is, past or future dollar amounts are converted into a current (i.e., 2022) dollar value—or present value—using an interest rate. Naturally, when performing an analysis using a money's worth measure, the choice of interest rate in the present value calculations is critical. There is no clear

⁶⁹ Dean Leimer, "A Guide to Social Security Money's Worth Issues," *Social Security Bulletin*, vol. 58, no. 2 (Summer 1995), <https://www.ssa.gov/policy/docs/ssb/v58n2/v58n2p3.pdf>.

⁷⁰ Clingman, Burkhalter, and Chaplain refer to the benefit-to-tax ratio as the *money's worth* ratio.

conclusion on what interest rates should be used when converting past and future Social Security benefit and tax amounts to present values. Many researchers agree that the government-guaranteed, tax preferred, inflation-indexed nature of the Social Security benefit warrants a low discount rate.⁷¹ The inflation-indexed rate is also referred to as a “real” interest rate, which is considered appropriate because Social Security benefits are generally automatically increased every year by the COLA (close to annual inflation).⁷² Research suggests choosing an interest rate “depends critically on the particular question the estimates are intended to address.”⁷³ Further analysis using money’s worth ratios suggest four possible interest rate series:

1. A nominal interest rate equal to the rate of inflation,
2. The rate of return earned on trust fund assets,
3. The total rate of return to an index of large company stocks, or
4. An interest rate equal to the growth in aggregate taxable earnings.⁷⁴

As described earlier in this report, in “Select Measures for Hypothetical Earners Across Birth Cohorts,” the analysis in this report used the nominal interest rate equal to the rate of inflation (i.e., growth in the CPI-U) to convert all nominal dollar values to 2022 dollars. The primary reason for this choice is the reasonable, albeit debatable, expectation for low and consistent growth in inflation. That is, U.S. policy exists to curtail inflation, which, theoretically, lends itself to projections more likely to be experienced than other proposed discount rates. Thus, current policy exists to limit price growth, whereas no policy exists to limit wage growth (i.e., growth in taxable earnings) or the rate of return earned on trust fund assets (i.e., effective nominal or real interest rates).⁷⁷

Given this, the report used the nominal interest rate equal to the rate of inflation—historical and projections under the trustees’ intermediate assumptions—to adjust all past and future earnings, taxes, and benefit amounts to 2022 dollars before calculating the selected measures (i.e., effective benefit rate, effective tax rate, and benefit-to-tax ratio). This decision influenced almost all of the calculations used in this report. However, although a decision to use a

Price Growth and US Policy

Under current law, the Federal Reserve “shall maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”⁷⁵ The two goals of maximizing employment and stabilizing prices are commonly referred to as the *dual mandate*. Since 2012, the Federal Open Market Committee—tasked with setting interest rates (i.e., the means to stabilize prices)—deemed that “low and stable inflation” is reflected in a growth rate of 2% per year.⁷⁶

⁷¹ See discussions in James E. Duggan and Christopher J. Soares, “Actuarial Nonequivalence in Early and Delayed Social Security Benefit Claims,” *Public Finance Review*, vol. 30, no. 3 (2002), pp. 188-207.

⁷² For more information, see “Interest Rates” in CRS Report R47151, *Social Security: Adjustment Factors for Early or Delayed Benefit Claiming*.

⁷³ Leimer, “A Guide to Social Security Money’s Worth Issues.”

⁷⁴ Dean Leimer, “Cohort-Specific Measures of Lifetime Social Security Taxes and Benefits,” ORES Working Paper no. 110 (December 2007), p. 11, <https://www.ssa.gov/policy/docs/workingpapers/wp110.html>.

⁷⁵ 12 U.S.C. §225a. For more information, see CRS In Focus IF11751, *Introduction to U.S. Economy: Monetary Policy*.

⁷⁶ Board of Governors of the Federal Reserve System, “Monetary Policy: What Are Its Goals? How Does It Work?,” July 29, 2021, <https://www.federalreserve.gov/monetarypolicy/monetary-policy-what-are-its-goals-how-does-it-work.htm>. The committee utilizes the personal consumption expenditure index for its measurement of price growth.

⁷⁷ The Social Security Advisory Board’s 2019 Technical Panel on Assumptions and Methods recommended lowering the assumed rate of growth in the CPI-W and cited the Federal Reserve’s official target of 2% price growth as the reason. 2019 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board*, September 2019, pp. 81-82, https://s3-us-gov-west-1.amazonaws.com/cg-778536a2-e58c-44f1-9173-29749804ec54/uploads/2020/04/TPAM-2019-FINAL-REPORT_508.pdf.

different time series for discounting purposes would have necessarily resulted in measures of different amounts, the relationship of those amounts relative to earnings levels, birth cohorts, and hypothetical scenarios remained consistent. For instance, **Table 2** presented the three selected measures under current law (i.e., scheduled) for hypothetical earners across four birth cohorts. That table is reproduced below, in **Table A-4**, using historical and projected growth in aggregate taxable earnings instead of CPI-U to discount all nominal values. Overall, the larger discount rate results in smaller present values and, thus, lower effective benefit rates and benefit-to-tax ratios. However, as can be seen, effective benefit rates are higher for relatively lower earners, which reflects the benefit formula's progressivity, and somewhat higher for younger birth cohorts, which reflects increases in average gender-adjusted life expectancy. The effective tax rate is almost identical to values obtained using inflation-indexed amounts—the small differences are attributable to rounding. The two measures combine to produce benefit-to-tax ratios that are in line with but less than those shown in **Table 2**.

Table A-4. Effective Benefit Rate, Effective Tax Rate, and Benefit-to-Tax Ratio for Hypothetical Earners by Birth Cohort Under Current Law

Under 2023 Intermediate Assumptions, Values Adjusted for Growth in Taxable Earnings

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Effective Benefit Rate					
1960	24.3%	17.7%	13.1%	10.9%	7.7%
1980	28.5%	20.7%	15.3%	12.7%	9.1%
2000	30.1%	21.8%	16.2%	13.4%	9.7%
2020	30.4%	22.0%	16.3%	13.6%	9.8%
Effective Tax Rate					
1960	12.15%	12.15%	12.15%	12.15%	12.06%
1980	12.31%	12.31%	12.30%	12.31%	12.30%
2000	12.40%	12.40%	12.40%	12.40%	12.40%
2020	12.40%	12.40%	12.40%	12.40%	12.40%
Benefit-to-Tax Ratio					
1960	2.02	1.47	1.09	0.90	0.65
1980	2.34	1.70	1.26	1.04	0.75
2000	2.42	1.76	1.30	1.08	0.79
2020	2.45	1.78	1.32	1.09	0.79

Source: CRS calculations based on hypothetical earner profiles developed by OCACT. Calculations assume scheduled benefits and payroll taxes paid under the 2023 intermediate assumptions and current law.

Notes: The effective benefit rate is calculated as total benefits received divided by total career covered earnings. The effective tax rate is calculated as total taxes paid divided by total career covered earnings. Total benefits received and total taxes paid are in 2022 dollars. The benefit-to-tax ratio is calculated as total benefits received divided by total taxes paid.

In the section on “Comparison of the Hypothetical Scenarios,” **Table 8** presented a side-by-side comparison of the effects of the four hypothetical scenarios examined in this report as measured by the change in benefit-to-tax ratios from the scheduled amounts. **Table A-5** reproduces that

analysis but using benefit-to-tax ratios calculated using historical and projected growth in taxable earnings instead of CPI-U to discount nominal values. Similarly, **Table A-5** shows that the hypothetical change with the lowest overall range for changes in the benefit-to-tax ratios is that for the immediate benefit reduction (0.38, overall range). This indicates that the impacts of this change in terms of the absolute decline in the benefit-to-tax ratios are less dispersed across earnings levels and birth cohorts, considered together. **Table A-5** also shows that the hypothetical change with the highest overall range for changes in the benefit-to-tax ratios is that for a delayed payroll tax rate increase (0.61). As discussed earlier, this hypothetical policy change would leave the 1960 birth cohort largely unaffected in both taxes paid and benefits received. These conclusions were also reached when considering benefit-to-tax ratio changes using inflation-indexed measures.⁷⁸

Table A-5. Change in Benefit-to-Tax Ratios from Scheduled Amounts for Hypothetical Workers by Earnings Levels and Birth Cohorts

Under the 2023 Intermediate Assumptions, Values Adjusted for Growth in Taxable Earnings

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner	Range
Immediate Payroll Tax Increase (Change in Benefit-to-Tax Ratio from Scheduled Amounts)						
1960	-0.04	-0.03	-0.02	-0.02	-0.01	0.02
1980	-0.31	-0.23	-0.17	-0.14	-0.09	0.22
2000	-0.52	-0.38	-0.28	-0.23	-0.16	0.36
2020	-0.53	-0.39	-0.29	-0.24	-0.17	0.36
Range	0.50	0.36	0.27	0.22	0.16	0.52 ^a
Immediate Benefit Reduction (Change in Benefit-to-Tax Ratio from Scheduled Amounts)						
1960	-0.43	-0.31	-0.23	-0.19	-0.14	0.29
1980	-0.50	-0.36	-0.27	-0.22	-0.16	0.34
2000	-0.52	-0.37	-0.28	-0.23	-0.17	0.35
2020	-0.52	-0.38	-0.28	-0.23	-0.17	0.35
Range	0.09	0.07	0.05	0.04	0.03	0.38 ^a
Delayed Payroll Tax Increase (Change in Benefit-to-Tax Ratio from Scheduled Amounts)						
1960	0.00	0.00	0.00	0.00	0.00	0.00
1980	-0.19	-0.14	-0.10	-0.09	-0.06	0.13
2000	-0.50	-0.37	-0.27	-0.22	-0.15	0.35
2020	-0.61	-0.45	-0.33	-0.27	-0.20	0.42
Range	0.61	0.45	0.33	0.27	0.20	0.61 ^a
Delayed Benefit Reduction (Change in Benefit-to-Tax Ratio from Scheduled Amounts)						
1960	-0.26	-0.19	-0.14	-0.12	-0.08	0.18
1980	-0.57	-0.41	-0.31	-0.26	-0.18	0.39
2000	-0.69	-0.50	-0.37	-0.31	-0.22	0.46

⁷⁸ The same conclusions were reached when analyzing the selected measures using the rate of return on trust fund assets.

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner	Range
2020	-0.63	-0.46	-0.34	-0.28	-0.20	0.43
Range	0.42	0.31	0.23	0.19	0.14	0.60 ^a

Source: CRS calculations based on hypothetical earner profiles developed by OCACT.

Notes: The benefit-to-tax ratio is calculated as total nominal benefits received divided by total nominal taxes paid. Total benefits received and total taxes paid were indexed to 2022 dollars.

- a. This value represents the range (i.e., maximum less minimum) of the 20 changes in benefit-to-tax ratios (five earnings groups by four birth cohorts). For example, the change in the benefit-to-tax ratio under the immediate payroll tax increase scenario has an overall range of 0.52, which equals -0.53 (maximum overall change) minus -0.01 (minimum overall change).

Comparison to Alternative Methods

As discussed in “Select Measures for Hypothetical Earners Across Birth Cohorts,” this report’s analysis requires assumptions. Some of the required assumptions do not match other research, such as those in *Money’s Worth Ratios Under the OASDI Program for Hypothetical Workers*.⁷⁹ A few examples include differences in claiming age, discount rates, and birth cohorts. Additionally, differences in publication dates required the use of different intermediate assumptions and hypothetical tax increases or benefit reductions. However, despite the different methodology, the conclusions reached in this report are similar. **Table A-6** shows the benefit-to-tax ratios under this different set of assumptions.

Table A-6. Benefit-to-Tax Ratios for Workers with Various Earnings Levels
For Selected Birth Cohorts

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Single Male					
1964	2.05	1.50	1.11	0.92	0.66
1973	2.23	1.63	1.21	1.00	0.73
1985	2.17	1.59	1.17	0.97	0.73
1997	2.02	1.48	1.09	0.91	0.68
2004	2.00	1.46	1.08	0.90	0.66
Single Female					
1964	2.41	1.76	1.30	1.08	0.77
1973	2.61	1.90	1.41	1.17	0.86
1985	2.49	1.82	1.34	1.12	0.84
1997	2.30	1.68	1.24	1.03	0.77
2004	2.26	1.65	1.22	1.01	0.75

Source: Michael Clingman, Kyle Burkhalter, and Chris Chaplain, *Money’s Worth Ratios Under the OASDI Program for Hypothetical Workers*, Table I, Social Security Administration, Office of the Chief Actuary, April 2022, <https://www.ssa.gov/OACT/NOTES/ran7/an2021-7.pdf>.

⁷⁹ Clingman, Burkhalter, and Chaplain, *Money’s Worth Ratios*.

Notes: The above figures are calculated under a different set of assumptions than those used in this report's analysis.

As can be seen, similar to this report's analysis (see **Table 2**), the benefit-to-tax ratios are calculated to be higher for the relatively lower career-average earners. Also similar is the estimated impacts of a delayed tax increase and a delayed benefit reduction (i.e., payable benefits scenario). For example, **Table A-7** shows the effects of a delayed payroll tax rate increase under the different set of assumptions.

Table A-7. Delayed Payroll Tax Increase: Change and Percentage Benefit-to-Tax Ratio for Hypothetical Earners with Various Earnings Levels

For Selected Birth Cohorts and Effective after 2033

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Single Male					
1964	0.00	0.00	0.00	0.00	0.00
	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.03	0.02	0.02	0.01	0.01
	1.35%	1.23%	1.65%	1.00%	1.37%
1985	0.20	0.15	0.11	0.09	0.06
	9.22%	9.43%	9.40%	9.28%	8.22%
1997	0.33	0.25	0.18	0.15	0.11
	16.34%	16.89%	16.51%	16.48%	16.18%
2004	0.41	0.30	0.22	0.19	0.13
	20.50%	20.55%	20.37%	21.11%	19.70%
Single Female					
1964	0.00	0.00	0.00	0.00	0.00
	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.05	0.03	0.03	0.02	0.02
	1.92%	1.58%	2.13%	1.71%	2.33%
1985	0.23	0.17	0.12	0.11	0.08
	9.24%	9.34%	8.96%	9.82%	9.52%
1997	0.38	0.28	0.21	0.17	0.12
	16.52%	16.67%	16.94%	16.50%	15.58%
2004	0.47	0.34	0.25	0.21	0.15
	20.80%	20.61%	20.49%	20.79%	20.00%

Source: Michael Clingman, Kyle Burkhalter, and Chris Chaplain, *Money's Worth Ratios Under the OASDI Program for Hypothetical Workers*, Table 2, Social Security Administration, Office of the Chief Actuary, April 2022, <https://www.ssa.gov/OACT/NOTES/ran7/an2021-7.pdf>.

Notes: The above figures are calculated under a different set of assumptions than those used in this report's analysis.

As shown, similar to this report's analysis (see **Table 6**), the benefit-to-tax ratios under this hypothetical scenario do not affect the relatively older birth cohort (i.e., 1964). Additionally, the

effects of such a change are more pronounced for the relatively younger birth cohorts as they would be subject to a higher payroll tax rate for a longer period. Likewise, as shown in **Table A-8**, the results for a delayed benefit reduction (i.e., payable benefit scenario) are also similar.

Table A-8. Delayed Benefit Reduction: Change and Percentage Benefit-to-Tax Ratio for Hypothetical Earners with Various Earnings Levels

For Selected Birth Cohorts and Effective after 2033

Birth Cohort	Very Low Earner	Low Earner	Medium Earner	High Earner	Maximum Earner
Single Male					
1964	0.29	0.21	0.16	0.13	0.09
	14.15%	14.00%	14.41%	14.13%	13.64%
1973	0.47	0.34	0.26	0.21	0.15
	21.08%	20.86%	21.49%	21.00%	20.55%
1985	0.53	0.39	0.28	0.23	0.18
	24.42%	24.53%	23.93%	23.71%	24.66%
1997	0.54	0.40	0.29	0.25	0.18
	26.73%	27.03%	26.61%	27.47%	26.47%
2004	0.55	0.40	0.30	0.25	0.18
	27.50%	27.40%	27.78%	27.78%	27.27%
Single Female					
1964	0.35	0.26	0.19	0.16	0.11
	14.52%	14.77%	14.62%	14.81%	14.29%
1973	0.56	0.40	0.30	0.25	0.18
	21.46%	21.05%	21.28%	21.37%	20.93%
1985	0.61	0.45	0.33	0.28	0.21
	24.50%	24.73%	24.63%	25.00%	25.00%
1997	0.62	0.45	0.33	0.28	0.21
	26.96%	26.79%	26.61%	27.18%	27.27%
2004	0.62	0.45	0.33	0.27	0.21
	27.43%	27.27%	27.05%	26.73%	28.00%

Source: Michael Clingman, Kyle Burkhalter, and Chris Chaplain, *Money's Worth Ratios Under the OASDI Program for Hypothetical Workers*, Table 3, Social Security Administration, Office of the Chief Actuary, April 2022, <https://www.ssa.gov/OACT/NOTES/ran7/an2021-7.pdf>.

Notes: The above figures are calculated under a different set of assumptions than those used in this report's analysis.

These results are similar to those from this report's analysis (**Table 7**), which showed that, although all birth cohorts estimated to be collecting benefits after the effective date, the decrease in benefit-to-tax ratios would be greater for the younger cohorts as they are projected to be collected benefits under a delayed benefit reduction scenario for a longer period.

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