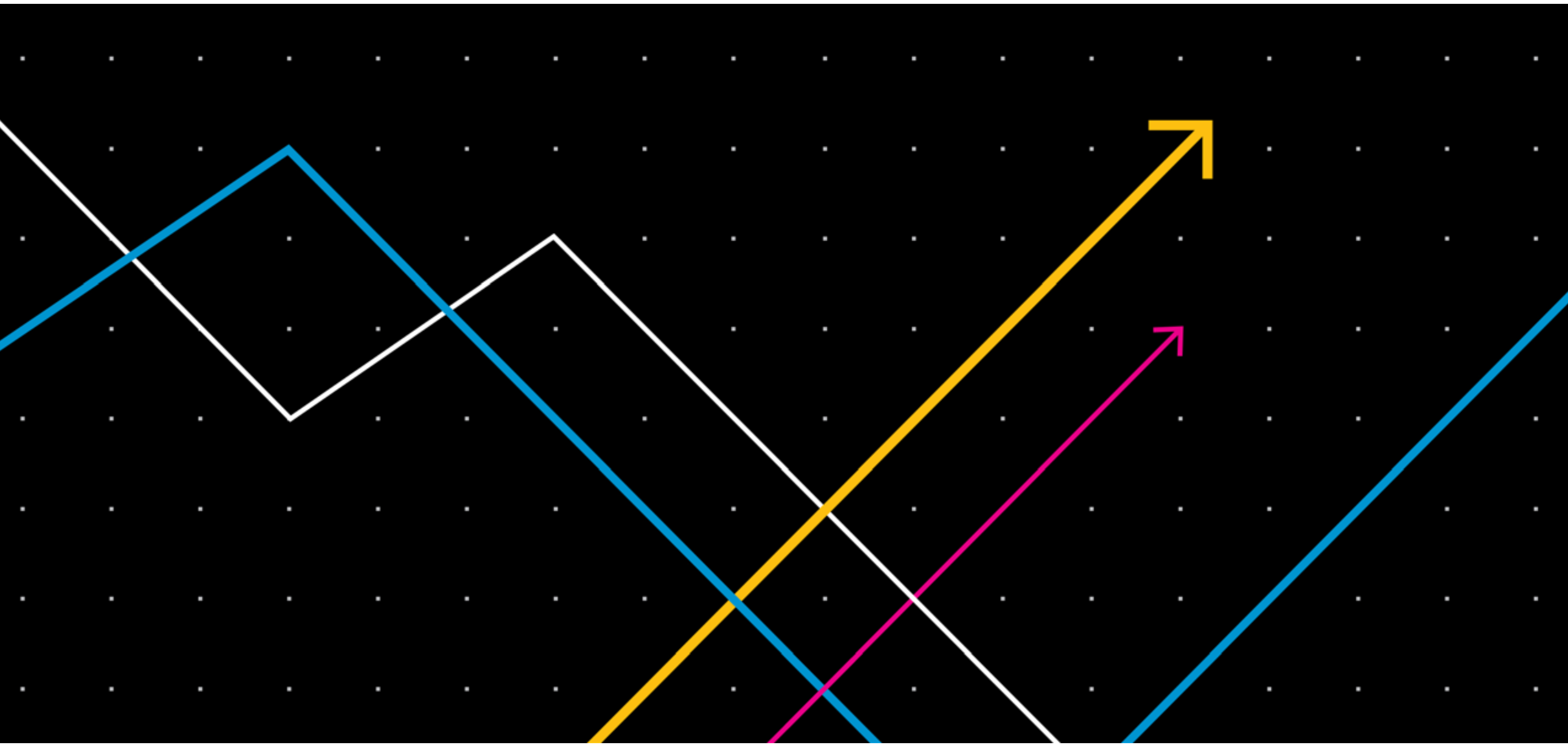

RESEARCH REPORT

Five Democratic Approaches to Social Security Reform

Estimated Impact of Plans from the 2020 Presidential Campaign

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Contents

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Executive Summary

The Social Security policy debate is intensifying. Social Security, the nation's largest government program, provides cash benefits to retirees, people with disabilities, and spouses, dependents, and survivors. Those payments account for much of beneficiaries' incomes, especially for low-income people. Yet, many older adults and people with disabilities struggle financially. Moreover, Social Security faces a long-term financing gap that could within a decade jeopardize its ability to pay full benefits. These challenges have prompted calls from many Democratic policymakers to expand Social Security benefits, especially for lower-income people, and to shore up the program's finances.

This report examines the Social Security proposals released by five candidates for the 2020 Democratic presidential nomination: former vice president Joe Biden, former mayor Pete Buttigieg, Senator Amy Klobuchar (D-MN), Senator Bernie Sanders (I-VT), and Senator Elizabeth Warren (D-MA). All the plans would expand benefits and improve program finances, but the extent of the impacts varies widely. Although Biden is the Democratic nominee, the other candidates' ideas illustrate the spectrum of approaches to changing Social Security being considered by the party.

All the plans would increase Social Security revenues by boosting payroll contributions from high-earning taxpayers. Currently, most of Social Security's revenue comes from a 12.4 percent payroll tax that is split evenly between workers and their employers and levied on annual earnings up to $137,700 in 2020. The Democratic candidates would extend the payroll tax to high earnings; all except Biden would tax earnings above $250,000, and Biden would tax earnings above $400,000. Additionally, Sanders and Warren would devote the proceeds from a new investment income tax on high-income investors to Social Security, and Warren would increase the payroll tax rate on high earnings and tax distributions to active participants in S corporations, partnerships, and limited liability companies. Buttigieg would automatically boost the payroll tax rate for high-earning workers to ensure that Social Security could pay all scheduled benefits each year.

The Democratic candidates would devote much of the additional revenue they raise to expanding Social Security benefits. The major benefit enhancements proposed by the candidates include:

- a new minimum benefit equal to 125 percent of the federal poverty level for a single adult (or $15,950 annually in 2020) for beneficiaries with at least 30 years of covered earnings. Beneficiaries with shorter careers would receive a prorated minimum benefit. Variants of this provision are part of Biden's, Buttigieg's, Sanders's, and Warren's plans.

- caregiver credits, which would credit earnings that factor into future benefit computations to workers who reduce their employment to care for children, older family members, and people with disabilities. Variants of this provision are part of Biden's, Buttigieg's, Klobuchar's, and Warren's plans.
- higher benefits for some surviving spouses of deceased beneficiaries. This provision is part of Biden's, Klobuchar's, and Warren's plans.
- a bonus equal to 5 percent of benefits for beneficiaries who have been collecting Social Security for 20 years. This provision is part of Biden's plan.
- increased cost-of-living adjustments, which would be tied to the change in the consumer price index for the elderly. That index generally grows faster than the index currently used to adjust benefits. This provision is part of Biden's, Sanders's, and Warren's plans.
- elimination of Social Security's Windfall Elimination Provision and Government Pension Offset, which reduce Social Security benefits for some retired government workers and their spouses and survivors. This provision is part of Biden's and Warren's plans.
- a $200 per month across-the-board increase in Social Security benefits. This provision is part of Warren's plan.
- an increase in the bottom bend point in the benefit formula that would boost payments to all beneficiaries except those with the lowest lifetime earnings. This provision is part of Sanders's plan.

We simulate the potential impact of each plan on beneficiaries, taxpayers, and Social Security's finances using the Dynamic Simulation of Income Model4 (DYNASIM4), the Urban Institute's unique dynamic microsimulation tool. The current version of DYNASIM4 uses the 2019 Social Security trustees' intermediate demographic and economic assumptions, which do not incorporate the potential effects of the COVID-19 pandemic. We limit our analysis to Social Security tax and benefit provisions even though many of the candidates propose additional policy changes that would affect older people's financial security. We assume that the candidates' plans would be implemented in 2021, and we often report impacts in 2065, when all plan provisions would have fully phased in.

Projected Impact on Social Security Finances

All five candidates' plans would significantly increase Social Security revenue. The impact would be largest under Warren's plan and smallest under Biden's plan. In 2021, projected program revenue would increase, relative to current law, 30 percent under Warren's plan, 15 percent under Sanders's plan, 10 percent under Buttigieg's and Klobuchar's plans, and 7 percent under Biden's plan. The plans' revenue increases would grow over time as wage growth and income growth increase the share of the population with earnings or investment income subject to higher taxes. We project that in 2065 program revenue would increase, relative to current law, 48 percent under Warren's plan, 40 percent under Buttigieg's plan, 26 percent under Sanders's plan, and 16 percent under Biden's and Klobuchar's plans.

Several candidates would devote much of this additional revenue to enhancing benefits. Warren's plan would increase benefits most, and Klobuchar's plan would increase benefits least. We project that in 2021 benefits would increase, relative to current law, 27 percent under Warren's plan, 11 percent under Buttigieg's plan, 4 percent under Biden's plan, 1 percent under Klobuchar's plan, and less than 1 percent under Sanders's plan. Under many of the proposed plans, increases in scheduled benefits—those specified by a plan regardless of its capacity to finance them—would grow over time as benefit enhancements phase in. We project that in 2065 scheduled benefits would increase, relative to current law, 16 percent under Warren's plan, 11 percent under Buttigieg's plan, 9 percent under Sanders's and Biden's plans, and 2 percent under Klobuchar's plan.

Projected revenue increases would outstrip scheduled cost increases under all the proposed plans, improving Social Security's finances. Our projections show that Warren's and Buttigieg's plans would eliminate Social Security's 75-year financial shortfall, but the other plans would not raise enough revenue to cover all scheduled benefits over 75 years. Nonetheless, they would significantly improve Social Security's finances and delay the date when the program trust funds are expected to run out. We project that Sanders's plan would close 81 percent of Social Security's long-term financing gap, Klobuchar's plan would close 70 percent of the gap, and Biden's plan would close 26 percent of the gap. The Social Security trustees project that the program's combined trust funds will run out in 2035. We project that the trust funds would last until 2040 under Biden's plan, 2061 under Klobuchar's plan, and 2076 under Sanders's plan. Social Security would not be able to pay all scheduled benefits after the trust funds are depleted unless Congress raises program revenues, but Biden's, Klobuchar's, and Sanders's plans would reduce the benefit cuts needed to balance costs and revenue. Our projections, however, do not account for the economic and demographic effects of the COVID-19 pandemic and associated recession, which will likely worsen Social Security's finances.

Projected Impact on Beneficiaries

All the Democratic candidates' plans would significantly increase Social Security benefits relative to current law, even when program financing constraints prevent Social Security from paying full scheduled benefits. We project that in 2065 average Social Security benefits would increase, relative to current law, 42 percent under Warren's plan, 38 percent under Buttigieg's plan, 36 percent under Sanders's plan, 18 percent under Klobuchar's plan, and 15 percent under Biden's plan. All the candidates' plans would reduce poverty rates for older adults and people with disabilities, increase the share of preretirement earnings that Social Security replaces, and increase lifetime benefits relative to lifetime earnings. They would increase the ratio of lifetime taxes to lifetime earnings for workers with high earnings but not for workers with low or moderate earnings.

The proposed plans would generate higher percent benefit increases for lower-income beneficiaries than for higher-income beneficiaries. Many of the proposed Social Security changes, such as an enhanced minimum benefit and caregiver credits, would target low-income beneficiaries. Other changes, such as an updated cost-of-living adjustment, a $200 per month benefit increase, an increase in the bottom bend point of the benefit formula, and a bonus to long-term beneficiaries, would increase payments to beneficiaries regardless of need. Biden's and Warren's proposals to repeal the Windfall Elimination Provision and Government Pension Offset, which reduce Social Security benefits for some retirees receiving government pensions and their spouses and survivors, would help many teachers, police, and firefighters, but relatively few of these retirees have low incomes. By strengthening Social Security's trust funds, the Democratic candidates' plans would eliminate or delay potential solvency-related benefit cuts, which would help beneficiaries at all income levels.

The timing of the benefit and contribution changes affects who gains from higher benefits and who pays for them. Buttigieg's and Warren's plans would initially pay much higher benefits to more beneficiaries than the other candidates' plans, which phase in benefit increases more slowly and often limit them to new beneficiaries. Early generations would gain substantially more from Buttigieg's and Warren's plans because they would receive higher benefits for more years without having to pay higher taxes. Warren's and Sanders's plans, which include a new investment income surtax, help spread the tax burden to some currently retired high-income beneficiaries who would never face a higher payroll tax. Biden's, Buttigieg's, and Klobuchar's plans, which are funded solely by higher taxes on earnings, puts more of the financing burden on later generations who have more work years ahead of them with higher tax rates.

Conclusions

Ultimately, the choice between more or less generous retirement and disability supports is a political decision. All the Democratic candidates have opted for a more generous social insurance system and avoid cutting scheduled payments to even the highest-income beneficiaries. Buttigieg's, Sanders's, and Warren's plans show that we can provide retirees and people with disabilities much more generous benefits as long as we are willing to increase program funding. Klobuchar's plan is less generous in terms of new benefits and Biden's plan is less generous in terms of additional financing, but they illustrate how incremental change can improve beneficiaries' financial security.

The decision about how to address Social Security's long-term financing challenges must be made within a larger budgetary context. Expanding Social Security and reducing the program's shortfall solely through increased revenues will leave federal policymakers with fewer resources to address other budgetary shortfalls, such as Medicare's long-term deficit and the broader federal debt, and to meet other public priorities.

Social Security Reform Proposals from the 2020 Democratic Presidential Campaign

Social Security, formally known as Old Age, Survivors, and Disability Insurance (OASDI), is the nation's largest federal program. In July 2020, it provided cash benefits worth $90.4 billion to 64.7 million retirees; people with disabilities; and spouses, dependents, and survivors.[1] However, the program faces a significant long-term financing gap. Social Security's trustees project that under current benefit and tax rules, the program's annual revenues will fall short of annual costs in 2021 and never recover (Board of Trustees 2020). Trust funds built up over the past four decades, when tax revenues from the large generation of baby-boomer workers exceeded benefit payments, can cover the shortfall for about a decade and a half, but the trustees' intermediate projections show that the trust funds will be depleted in 2035. When that happens, the program will be able to cover only about four-fifths of scheduled benefits. These projections were completed before the COVID-19 pandemic upended the global economy, which could worsen the program's financial outlook.

Despite the program's financial problems, some advocates are calling on federal policymakers to increase Social Security benefits to strengthen financial security for older adults and people with disabilities (Altman and Kingson 2015; Morrissey 2018). Social Security benefits account for about half of the income received by adults age 65 and older and for about three-quarters of the income received by those older adults in the bottom third of the income distribution (Bee and Mitchell 2017). The average monthly Social Security benefit was only about $1,400 in July 2020.[2] Consequently, many retirees and people with disabilities struggle financially. In 2019, 13 percent of adults age 65 and older had income below the federal poverty level (FPL), according to the US Census Bureau's supplemental poverty measure, which is a more accurate indicator of financial need than the official poverty measure (Fox 2020). Economic hardship is more prevalent among certain groups of retirees, including Black people; Latino people; adults who did not complete high school; and widowed, divorced, and never-married adults (Johnson 2020a). Many people with disabilities also struggle financially. Nearly half of adults ages 31 to 49 who receive Social Security disability benefits are in the bottom fifth of the income distribution (Favreault, Johnson, and Smith 2013). Some policymakers have recently responded to these concerns with legislation to expand Social Security, such as the Social Security 2100 Act introduced in Congress in 2019 by Representative John Larson.[3]

Several candidates for the 2020 Democratic presidential nomination have released plans to reform Social Security. Although the presidential primary is over and former vice president Joe Biden is the Democratic nominee, the other candidates' ideas live on and illustrate the spectrum of Social Security reform approaches being considered by the party, including in its platform.[4] Most of these proposals share common features. They would raise revenues to improve Social Security's finances, typically by requiring high-wage workers and their employers to contribute more. They also enhance benefits through many provisions designed to help low-income beneficiaries. However, many of the plans differ significantly. Most plans include a minimum benefit that would keep beneficiaries with long careers out of poverty. Some would enhance benefits for certain groups, such as long-term beneficiaries who often incur high out-of-pocket medical expenses; the surviving spouses of deceased beneficiaries; and people who temporarily left the labor force or worked less than full-time to care for children, elderly adults, or people with disabilities. Other proposals would raise benefits across the board. Moreover, some candidates would tax additional types of income and dedicate those revenues to Social Security. None of the plans would reduce Social Security benefits.

This report examines the Social Security reform proposals developed by several Democratic presidential candidates and estimates their potential impact on beneficiaries, taxpayers, and program solvency.[5] We compare plans released by Biden, former mayor Pete Buttigieg, Senator Amy Klobuchar (D-MN), Senator Bernie Sanders (I-VT), and Senator Elizabeth Warren (D-MA). The analysis uses the Dynamic Simulation of Income Model 4 (DYNASIM4), the Urban Institute's unique dynamic microsimulation tool. The current version of DYNASIM4 uses the 2019 Social Security trustees' intermediate demographic and economic assumptions (Board of Trustees 2019), which do not incorporate the potential effects of the COVID-19 pandemic. We limit our analysis to Social Security tax and benefit provisions even though many of the candidates propose additional reforms that would affect older people's financial security. For example, several candidates propose expanding Supplemental Security Income, a federal program that provides cash benefits to older adults and people with disabilities with very limited income and assets.

Our results show that the Social Security plans developed by the Democratic presidential candidates could improve program financing and beneficiary well-being, but the extent of the likely impacts varies widely. Warren's plan is the most expansive, including sweeping tax increases and benefit expansions, while Klobuchar's plan is the most modest, including a much smaller tax hike and narrower benefit increases. Biden's plan includes many benefit-enhancing provisions, but it has the smallest tax increase and, like current law, cannot fully fund promised benefits. Like current law, his plan's long-term revenue shortfall would eventually require additional Congressional action to increase

Social Security revenues to avoid future benefit reductions. Nonetheless, compared with current law, all plans would significantly expand Social Security, with Warren's plan increasing program outlays by half in 2040 and Biden's plan increasing outlays by nearly a fifth. Unlike some past center-left Social Security reform proposals, none of these Democratic reform plans would reduce payments to any beneficiaries, even those with the highest incomes.[6] All the plans we examine would reduce Social Security's long-term financing gap by raising taxes on workers with substantial earnings, but we find that only Warren's and Buttigieg's plans would achieve program solvency over a 75-year horizon under the trustees' 2019 intermediate assumptions.

By bolstering Social Security's trust funds, the Democratic candidates' plans would eliminate or delay potential solvency-related benefit cuts, which would help beneficiaries at all income levels. None of the plans would reduce payments to any beneficiaries. Certain benefit enhancements included in some of the plans, such as the introduction of a minimum benefit and caregiver credits, would target low-income beneficiaries. Other provisions enhance benefits more broadly. All the plans we examine would significantly reduce economic hardship among older and disabled adults. However, the substantial tax hikes included in some of the plans could limit economic growth and leave less potential revenue available to address other pressing public priorities.

How Does Social Security Work?

Social Security provides cash benefits to retirees and people with disabilities as well as to their dependents and survivors. Established in 1935, the program paid its first retirement benefits in 1940. Disability benefits were added in 1956, initially available only to covered workers age 50 and older with long lasting medical conditions that prevent work. The age restriction was dropped in 1960, but beneficiaries must have completed a certain amount of covered work to qualify.

Social Security replaces a portion of lifetime earnings when workers retire or develop disabilities, and higher lifetime earnings translate into larger Social Security benefits. The benefit formula is progressive, replacing a larger share of earnings for low-wage workers than for high-wage workers. To compute benefits, Social Security indexes a worker's lifetime earnings to changes in the economy-wide average wage and then calculates average indexed monthly earnings (AIME) over a worker's highest-paying 35 years. Each year, however, Social Security limits the amount of earnings that count toward future benefits. That limit, known as the contribution and benefit base, is $137,700 in 2020 and increases over time with the growth in the average national wage.[7] The program uses AIME to compute the basic benefit, or primary insurance amount (PIA), which is paid to beneficiaries who begin collecting

at the full retirement age (65 to 67, depending on a beneficiary's birth year). For workers who turn 60 in 2020, the PIA equals 90 percent of their first $960 of AIME ($11,520 annually) plus 32 percent of additional earnings up to $5,785 of AIME ($69,420 annually) and 15 percent of AIME over $5,785. The monthly benefit paid by Social Security is reduced for beneficiaries who begin collecting before the full retirement age and increased for those who delay collecting until after the full retirement age.[8] Social Security benefits are updated annually by the change in the cost of living, based on the Bureau of Labor Statistics' consumer price index for urban wage earners and clerical workers (CPI-W).

Social Security also pays spousal and survivor benefits. Instead of collecting benefits based on their own earnings, beneficiaries may receive 50 percent of their spouse's PIA or 100 percent of their deceased spouse's benefit if collecting on their spouse's earnings would generate a higher payment. Spouse and survivor benefits are available to divorced people if their marriage lasted at least 10 years.

Social Security is financed mainly through payroll taxes. The current payroll tax rate is 6.2 percent, and that rate is levied on both covered employees and their employers. Self-employed workers pay 12.4 percent of their earnings to the program. However, only earnings in covered employment below the contribution and benefit base are subject to taxation each year. Although the base typically increases with the change in the average national wage, the share of covered workers' earnings subject to the program's payroll tax decreased from 90 percent in 1983 to 83 percent in 2018 because earnings have increased more rapidly for high-wage workers than for moderate- and low-wage workers (Social Security Administration 2019a, table 4.B1; Johnson 2020b).

Congress began taxing a portion of Social Security benefits in 1984 and devoting that revenue to Social Security and, since 1993, to Medicare. Benefits are taxed only for beneficiaries with incomes of $25,000 or more if single and $32,000 or more if married. Those income thresholds are not indexed for inflation, however, so the share of beneficiaries paying taxes on their Social Security benefits has been growing over time. Between 1984 and 2018, revenue from the taxation of benefits increased from 1.8 percent to 4.1 percent of benefits paid (Social Security Administration 2019a, table 4.A1). The Congressional Budget Office estimates that about half of Social Security beneficiaries paid income tax on their benefits in 2014 (Shakin and Seibert 2015).

Social Security faces a long-term financing gap that program trustees have warned about for decades as fertility has declined and life expectancy has increased, reducing the number of workers supporting each retiree. The trustees' most recent intermediate projections indicate that under current rules, the program's 75-year shortfall totals 3.21 percent of taxable payroll and program costs will exceed revenues in 2021 and every subsequent year for the foreseeable future (Board of Trustees

2020).[9] Social Security maintains two trust funds, one for Old Age and Survivors Insurance and the other for Disability Insurance. These trust funds grew significantly after 1983, when Congress last addressed Social Security financing, and they can cover the shortfall for the next decade and a half. However, the trustees project that the combined OASDI trust fund reserves will be depleted in 2035, just 15 years from now.

The trustees estimate that if Congress takes action today, it could eliminate the shortfall by increasing the payroll tax 3.14 percentage points. Alternatively, Congress could eliminate the 75-year shortfall by cutting payments 19 percent for all beneficiaries or cutting payments 23 percent only for beneficiaries who first began collecting after 2019 (Board of Trustees 2020). If instead Congress waits until 2035 to address Social Security's financing gap, the required program changes would be larger. The Social Security Trustees report that in 2035, a 4.13 percentage point payroll tax increase, a permanent benefit reduction of 25 percent, or some combination of those would be required to fully fund the program (Board of Trustees 2020).

What Did the Democratic Candidates Propose?

The five leading Democratic presidential candidates each proposed a series of Social Security reform measures that would increase program revenues and enhance benefits. Sanders introduced his plan, the Social Security Expansion Act, in the US Senate on February 13, 2019.[10] The legislative language and a cost analysis by the Social Security Administration (Goss 2019) provide details on his proposal. The Democratic vice-presidential nominee, Senator Kamala Harris (D-CA), co-sponsored Sanders's bill with three other Democratic senators. Descriptions of the other candidates' Social Security plans were available on their campaign websites.[11] We corresponded with campaign staff to obtain additional details to ensure we interpreted their proposed policies correctly.[12]

Revenue-Enhancing Provisions

The candidates' Social Security reform plans would significantly increase program revenues to narrow Social Security's financing gap and fund enhanced benefits (table 1). All the plans we examined would substantially increase the payroll contribution base by requiring high earners and their employers to contribute more. Each plan would collect payroll contributions from two tiers of earnings. The first tier consists of the existing contribution base, which now covers earnings up to $137,700. That limit increases over time with the growth in average wages. The second tier would consist of annual earnings

above a certain level, set at $250,000 in each proposal except Biden's plan, which would tax additional earnings only for workers earning more than $400,000. None of the proposed plans would change the required contribution rate on the first contribution tier. Warren's plan would tax second-tier earnings at 14.8 percent, split evenly between workers and their employers, whereas the other plans would tax them at 12.4 percent, the rate that applies for the first tier. In each plan, payroll contributions from high earners would stop temporarily after their earnings exceed the first contribution tier and resume once their earnings exceed the threshold for additional contributions. Because the earnings level at which the second contribution tier begins is not indexed, however, this "donut hole" in the payroll contribution schedule would gradually disappear over time as the first contribution tier increases with earnings growth.[13] Unlike the other plans, Buttigieg's plan would automatically increase the payroll tax rate on high earners to keep Social Security solvent over a 75-year horizon without cutting benefits.

TABLE 1

Revenue-Enhancing Provisions Included in the Democratic Candidates' Social Security Plans

Provision	Biden	Buttigieg	Klobuchar	Sanders	Warren
Increase the payroll contribution base	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
What earnings are covered?	> $400,000	> $250,000	> $250,000	> $250,000	> $250,000
Contribution rate on these earnings	12.4%	12.4%, plus future increases to achieve solvency	12.4%	12.4%	14.8%
Benefits earned on new contributions?	No	Yes, but at a reduced rate	No	No	No
Automatically increase payroll tax on high earners to ensure solvency	**No**	**Yes**	**No**	**No**	**No**
Tax investment income	**No**	**No**	**No**	**Yes**	**Yes**
Income threshold	NA	NA	NA	> $200,000 for singles; > $250,000 for married couples	> $250,000 for singles; > $400,000 for married couples
Tax rate	NA	NA	NA	6.2%	14.8%
Tax distributions to active participants in S corporations, partnerships, and LLCs	**No**	**No**	**No**	**No**	**Yes**

Source: Authors' analysis of candidates' proposals.

Notes: LLC = limited liability company; NA = not applicable. Contribution rates refer to the combined employer-employee rate. None of the plans would index the earnings threshold for the second-tier contribution base.

Except for Buttigieg's plan, none of the Democratic candidates' plans would allow workers to earn Social Security benefits on their second-tier contributions. These additional contributions would pay for other benefit expansions and reduce Social Security's long-term financing shortfall. The additional contributions collected under Buttigieg's plan would also help close the program's financing gap because workers would earn only limited benefits on those contributions. His plan would index earnings in the second contribution tier over a career and add 2 percent of those indexed earnings to the primary insurance amount, less than the 15 percent replacement rate applied to the highest earnings covered by Social Security under existing rules.

Warren's and Sanders's plans would also broaden Social Security's revenue tax base to include investment income. Modeled after the Affordable Care Act's net investment income tax, both plans would tax net investment income (including interest, dividends, royalties, capital gains, and rental income, minus investment expenses) for high-income taxpayers and apply the proceeds to the Social Security trust funds. Warren's plan would set the income thresholds at $250,000 for single filers and $400,000 for married couples filing jointly and set the tax rate at 14.8 percent. Sanders's plan would set the income thresholds at $200,000 for single filers and $250,000 for married couples filing joining and set the tax rate at 6.2 percent. However, the investment income subject to this tax could not be greater than the amount by which modified adjusted gross income exceeds the net investment income tax thresholds. Warren's plan would also levy this tax on distributions received by active participants in S corporations, limited partnerships, and limited liability companies.[14] These income thresholds are not indexed for inflation, so the share of filers subject to the tax would increase over time.

Benefit-Enhancing Provisions

The Democratic presidential candidates each proposed increasing payments to Social Security beneficiaries (table 2). Some benefit enhancements would apply to all beneficiaries; others would target specific groups, such as caregivers, surviving spouses, retirees receiving government pensions, and long-term beneficiaries.

Sanders's and Warren's plans both include across-the-board benefit increases. Warren's plan would provide a $200 monthly bonus to all beneficiaries in addition to other benefit increases included in her plan (described later in this report). Sanders's plan would raise benefits by increasing the first bend point in the benefit formula 15 percent, thus increasing the portion of AIME subject to a 90 percent replacement rate. The increase would be phased in gradually over time, increasing 1 percent a year for 15 years.

TABLE 2

Major Benefit-Enhancing Provisions Included in the Democratic Candidates' Social Security Plans

Provision	Biden	Buttigieg	Klobuchar	Sanders	Warren
Increase monthly benefits across the board by $200	**No**	**No**	**No**	**No**	**Yes**
Increase the first bend point in the benefit formula	**No**	**No**	**No**	**Yes**	**No**
Increase minimum benefits to 125% of FPL	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Index minimum to the growth in average wages	Yes	No	NA	Yes	No
Minimum applies to new beneficiaries only, or all	New only	All	NA	New only	All
Increase COLA by using CPI-E to raise benefits	**Yes**	**No**	**No**	**Yes**	**Yes**
Increase payments to long-term beneficiaries	**Yes**	**No**	**No**	**No**	**No**
Increase survivor benefits	**Yes**	**No**	**Yes**	**No**	**Yes**
Provide caregiver credits	**Yes**	**Yes**	**Yes**	**No**	**Yes**
Credit amount	Own earnings plus up to 50% of national average wage	100% of national average wage	50% of national average wage	NA	100% of national average wage
Maximum age for qualifying child	11	17	5	NA	5
Limit on caregiver credits	5 years	None	None	NA	None
Eliminate WEP and GPO	**Yes**	**No**	**No**	**No**	**Yes**

Source: Authors' analysis of candidates' proposals.

Notes: COLA = cost-of-living adjustment; CPI-E = consumer price index for the elderly; FPL = federal poverty level; GPO = Government Pension Offset; NA = not applicable; WEP = Windfall Elimination Provision.

INCREASE THE MINIMUM BENEFIT

Social Security currently includes a minimum benefit, a feature designed to boost payments to retirees who spent many years working at low wages, but the minimum is too low to help many beneficiaries. At the end of 2019, just 32,000 Social Security beneficiaries received the special minimum, less than 0.1 percent of all Social Security beneficiaries (Social Security Administration 2020a, table 5.A8). No new Social Security awards have included the special minimum since 1998, except for a few retirees receiving government pensions that reduced their Social Security benefits (Feinstein 2013).

Biden, Buttigieg, Sanders, and Warren all propose a new Social Security minimum benefit equal to 125 percent of the FPL for a single adult, or $15,950 annually in 2020. Beneficiaries must have completed 30 years of covered employment to qualify for the full minimum, but all beneficiaries with at

least 10 years of covered employment could qualify for a prorated share of the minimum.[15] These employment eligibility rules would apply to beneficiaries and their survivors, including those who die or develop disabilities before age 62.

Some details regarding the minimum benefit differ across the proposals. Biden's and Sanders's proposals would index the minimum benefit to the annual change in the average national wage, whereas the minimum benefit in Buttigieg's and Warren's proposals would grow over time as the FPL increases. Because the FPL adjusts each year with inflation and because wages generally grow faster than inflation, the minimum benefit would increase more rapidly under Biden's and Sanders's proposals. On the other hand, all beneficiaries could qualify for the minimum benefit under Buttigieg's and Warren's proposals, whereas Biden's and Sanders's minimum benefit would cover only new beneficiaries (those who begin collecting benefits or die after 2020).

INCREASE COST OF LIVING ADJUSTMENTS

Biden's and Warren's proposals would increase Social Security's cost-of-living adjustment (COLA) by tying it to the change in the experimental consumer price index for the elderly (CPI-E) instead of the CPI-W. The Bureau of Labor Statistics computes the CPI-W based on spending by urban wage earners and clerical workers, who generally do not collect Social Security benefits. The experimental CPI-E is based on spending by adults age 62 and older and their families. Compared with the CPI-W, the CPI-E gives more weight to spending on medical care and housing and less weight to spending on transportation, education, food and beverages, and apparel (Bureau of Labor Statistics 2012) and may better reflect the spending needs of Social Security beneficiaries (Koenig and Waid 2012; National Committee to Preserve Social Security and Medicare 2017).

In most years, the CPI-E has increased more rapidly than the CPI-W. The Social Security actuaries assume that the CPI-E would grow 0.2 percentage points more than the CPI-W each year.[16] Although the difference between the two indexes is small, the impact on benefit levels of using the CPI-E instead of the CPI-W would cumulate over time and become substantial for long-term beneficiaries. The Social Security trustees' intermediate assumptions imply, for example, that beneficiaries would receive 5 percent more in their 25th year of benefit collection if the COLA were based on the CPI-E rather than the CPI-W.

INCREASE PAYMENTS TO LONG-TERM BENEFICIARIES

Biden's plan provides additional help to long-term beneficiaries. It would boost payments by 1 percent of the average benefit for beneficiaries who had collected payments for 16 years and provide an

additional 1 percent bonus for each additional year of collection until the benefit bump-up reaches 5 percent of the average benefit for beneficiaries who had collected for 20 years.[17] Payments would then remain at that level, plus annual COLAs.

Many long-term Social Security beneficiaries receive relatively low payments because their benefits are based on earnings received many years earlier. The COLA raises payments to offset inflation, but because wages typically grow faster than prices, beneficiaries who began collecting more recently generally receive larger benefits than those who began collecting earlier. Moreover, out-of-pocket spending on medical care and home and residential care typically surges after age 80 (Cubanski et al. 2019; Hatfield et al. 2018), exacerbating economic hardship for many long-term beneficiaries. However, a benefit bump-up for long-term beneficiaries does not necessarily go to the most vulnerable beneficiaries, because those who survive to older ages tend to have more lifetime earnings than those who die at relatively young ages (Bosley, Morris, and Glenn 2018; Chetty et al. 2016; Waldron 2007).

INCREASE SURVIVOR BENEFITS

Biden's, Klobuchar's, and Warren's proposals would increase Social Security benefits to some surviving spouses of deceased beneficiaries, who made up about 6 percent of all Social Security beneficiaries in 2018 (Social Security Administration 2019a, table 5.A1). In addition to providing survivors with the existing option of receiving 100 percent of their spouse's benefit upon his or her death or retaining 100 percent of their own worker benefit, this proposal would provide survivors with the option to collect 75 percent of the total benefit received by the household before the deceased spouse died (but no more than the benefit received by a two-earner couple with average career earnings).

As well as increasing overall survivor benefits, this change would reduce the disparity in survivor benefits between spouses in dual-earner couples and those in single-earner couples.[18] Under current benefit rules (Social Security Administration 2019d), survivors in dual-earner couples in which both spouses received similar earnings over their lifetime would generally experience about a 50 percent cut in household benefits upon their spouse's death. Survivors in single-earner couples (or in couples in which one spouse earned much more than the other) would generally experience a 33 percent cut in benefits upon their spouse's death. Under the proposed change to survivor benefits, the benefit cut would be no more than 25 percent of the household benefits received before a spouse's death (except for some high-income beneficiaries). This proposal could help reduce the poverty rate for older widows, which is more than three times as high as the rate for older married women (Social Security Administration 2016). However, boosting survivor benefits could exacerbate inequities by race, lifetime earnings, and education (Favreault and Mermin 2008; Harrington Meyer, Wolf, and Himes 2004). Black

people and Latino people, for example, are less likely to marry and more likely to divorce than non-Hispanic white people.

PROVIDE SOCIAL SECURITY CREDITS TO CAREGIVERS

Biden's, Buttigieg's, Klobuchar's, and Warren's proposals would extend Social Security credits to workers who take time out of the workforce to care for children, for dependents with disabilities, or for aged family members. For every month that caregivers provide at least 80 hours of care, Social Security would credit them with earnings tied to the average national monthly wage, not their own past earnings. Those earnings would factor into the AIME calculation, in most cases raising future Social Security benefits.[19] Buttigieg and Warren would credit caregivers with the full average national wage, whereas Biden and Klobuchar would credit them with half of the average national wage. Biden's caregiver credit differs from the other candidates' credits. His plan would provide a credit on top of a caregiver's earnings, but it would phase out the credit by 50 cents for every $1 earned by the caregiver until the credit is eliminated for workers earning the average wage; the other candidates' plans would replace a caregiver's earnings in the Social Security benefit formula with the caregiver credit as long as that credit exceeded the worker's earnings. In 2017, the average national wage was $50,322 and median earnings were $30,079, so a 100 percent credit would exceed earnings for more than half of all earners. Buttigieg's proposal credits caregivers of all children under age 18, Biden's proposal credits caregivers of children under age 12, and Klobuchar's and Warren's proposals restrict credits to caregivers of children under age 6. Buttigieg's, Klobuchar's, and Warren's plans do not cap the number of caregiving years eligible for a Social Security credit, but Biden's plan allows only 5 years of caregiver credits. All of the plans limit credits to caregiving activities that occurred before beneficiaries claimed Social Security.

Caregiver credits could significantly boost Social Security benefits for women, who shoulder most caregiving responsibilities (Parker 2015; Schulz and Eden 2016). Women earn lower Social Security benefits than men because they earn lower wages and work fewer hours, often because of caregiving responsibilities (Cosic, Johnson, and Smith 2018; Favreault 2018). Providing help directly to caregivers, rather than helping them indirectly through spousal benefits, would benefit single mothers, who are disproportionately low-income women of color (Livingston 2018), although people who cannot afford to leave the workforce or reduce their paid work hours would not benefit from the proposal.

ELIMINATE SOCIAL SECURITY OFFSETS FOR UNCOVERED GOVERNMENT EMPLOYEES

Both Biden and Warren propose repealing Social Security's Windfall Elimination Provision (WEP) and Government Pension Offset (GPO), which reduce Social Security benefits for workers receiving

government pensions from jobs not covered by Social Security (Social Security Administration 2019b, 2020b). Some state and local government jobs that provide relatively generous pensions do not provide Social Security coverage. Workers who retire from these jobs and were employed in a Social Security covered job generally have low AIMEs because they spent much of their career in uncovered employment. The progressive Social Security benefit formula would ordinarily replace a large share of their covered earnings. To prevent this windfall, the WEP, enacted in 1983, reduces the replacement rate on earnings below the first bend point from 90 percent to 40 percent for beneficiaries receiving a government pension from an uncovered job with no more than 20 years of covered employment. The WEP reduction phases out for beneficiaries with more than 20 years of covered employment and ends once beneficiaries complete 30 years of covered employment.

The GPO, enacted in 1977, is similar to the WEP but applies to spouse and survivor benefits. This provision reduces spouse and survivor Social Security benefits by two-thirds of any government pension income received from an uncovered job. The GPO aims to treat government workers similarly to private-sector workers, whose Social Security worker benefits would limit access to spouse and survivor benefits.

In 2019, the WEP reduced benefits for 1.9 million Social Security beneficiaries, or about 2 percent of all beneficiaries, and the GPO reduced spouse and survivor benefits for about 700,000 beneficiaries, or about 1 percent of all beneficiaries, eliminating benefits for about three-quarters of them (Li 2020). Abolishing the WEP and GPO would remove an unpopular and often misunderstood Social Security provision that mainly affects teachers, police officers, and firefighters (Boyens, Kolasi, and Smalligan 2019). However, eliminating the provisions would create disparities in the treatment of government and public-sector retirees. Several recent Congressional bills would reform the way Social Security computes benefits for government pensioners rather than eliminating those cuts.[20]

OTHER BENEFIT ENHANCEMENTS

Warren's and Sanders's proposals include other provisions that would enhance Social Security benefits. Both candidates would extend family benefits to children older than age 18 if they are enrolled full time in high school, college, or vocational school. Social Security now pays benefits to the children of beneficiaries, but those benefits generally end when children turn 18. Sanders would extend the age cutoff for child benefits to 22 for students, and Warren would extend the cutoff to age 24.[21]

Warren's plan would also expand survivor benefits for people with disabilities and adjust future Social Security benefits for time that beneficiaries spent in training and apprenticeship programs. Currently, Social Security provides benefits to survivors of deceased beneficiaries age 50 and older if

they have a disability that began within seven years of the worker's death and reduces their benefits to 71.5 percent of the deceased worker's basic benefit amount. (Survivors without disabilities cannot receive Social Security until age 60.)[22] Warren's proposal would eliminate that age requirement and the reduction factors for early claiming. Warren's proposal would also exclude from a worker's AIME calculation up to three years spent in job training and apprenticeship programs. This adjustment would raise participants' future Social Security benefits by excluding some zero-earnings years from the AIME calculation.

Methods and Data

We simulate how the Democratic presidential candidates' Social Security reform proposals would affect program finances and payments received by beneficiaries. For each proposal, we compare outcomes to each other and to current law. The analysis focuses on payable scenarios, which show payments that Social Security could afford to make under existing tax rates and benefit rules or under the tax rates and budget rules proposed by the candidates; under these scenarios, benefits are reduced to match available tax revenues once the trust funds are depleted. We also sometimes show outcomes under scheduled scenarios, which show what payments would be under existing benefit rules or under the benefit rules proposed by the candidates if program revenues were unlimited. Social Security studies sometimes make other assumptions about how the program's financing gap would be closed after the trust funds are depleted, such as by increasing payroll taxes to fund scheduled benefits (Clingman, Burkhalter, and Chaplain 2020) or combining a payroll tax increase with an equal reduction in benefits (Bosworth, Burtless, and Keys 2003), but we limit the number of comparisons here to keep the analyses tractable. Unless otherwise noted, we assume that all reforms would be enacted in 2021. We report all amounts in inflation-adjusted 2018 dollars.

To assess the impact of the candidates' proposed Social Security reform plans on program finances, we simulate Social Security's noninterest income and costs, the program's long-term actuarial balance, the trust fund ratio, and the trust fund exhaustion year. We project these outcomes for 75 years, the horizon Social Security uses to assess the program's financial condition.

Although Social Security maintains two trust funds, we follow the common practice of combining these trust funds in our projections. The long-term actuarial balance summarizes the program's financial condition throughout the 75-year projection period. We compute the long-term actuarial balance as the present discounted value of noninterest revenues over the period plus the value of the trust funds at the start of the period, minus the present discounted value of projected costs over the

period and the present discounted value of projected costs in the 76th year. These values are expressed as a percentage of the present discounted value of taxable payroll projected over the period. The trust fund ratio is defined as the combined Social Security trust fund reserves expressed as a percentage of annual program cost. The program is considered solvent when the trust fund ratio remains positive throughout the 75-year projection period. We identify the trust fund exhaustion year based on when the trust fund ratio first falls below zero. When the trust funds run out, the current-law-payable scenario reduces all Social Security benefits across the board by the percentage necessary to keep program costs equal to program revenue.[23] The analysis computes projected cost rates, defined as program cost as a percentage of taxable payroll, and income rates, defined as noninterest income as a percentage of taxable payroll. In all cases, we show cost estimates for each candidate's payable plan. We also estimate the effect of each reform provision in isolation, with no other changes, reporting the impact on the long-term actuarial balance and on beneficiaries.

Additionally, our analysis examines how the candidates' proposals would change federal revenue and expenditures. Our revenue measure includes changes in receipts from the federal individual income tax, Social Security and Medicare payroll tax (including the 3.8 percent net investment income surtax and the 0.9 percent additional Medicare tax imposed on some high income taxpayers), income-related premiums for Medicare Parts B and D, and the Social Security net investment income surtax imposed by Sanders's and Warren's plans.[24] Our expenditure measure includes changes in Social Security, Supplemental Security Income (SSI), and other government benefits.[25] We aggregate the change in federal revenue and expenditures between 2021 and 2030 because Congress usually considers the 10-year impact on net federal expenditures when evaluating tax and spending proposals.

Much of our analysis focuses on how each of the proposals would affect workers and beneficiaries. For beneficiaries, we show how reform plans would affect Social Security benefits; median income; the share of beneficiaries with low incomes; and the share of preretirement earnings beneficiaries are able to replace at age 70, when most people have retired and begun collecting benefits. We generally report outcomes for adults receiving disability or retirement benefits. When measuring Social Security benefits, we subtract any federal income taxes paid on those benefits, following Congressional Budget Office conventions. We report per capita median income net of taxes by (1) subtracting from income federal and state income taxes, Social Security and Medicare payroll taxes (including the additional Medicare tax and the net investment income tax), and income-related Medicare Part B and Part D premiums above the base premium and (2) dividing income and taxes by two for married couples. We show how income varies by demographic and economic characteristics, including race and Hispanic

origin, educational attainment, marital status, age, work years, and income and lifetime earnings quintiles.

We use two alternative measures to classify beneficiaries as having low incomes. The first measure indicates whether family income falls below 100 percent of the FPL.[26] The second measure indicates whether family income, adjusted for family size, falls below 25 percent of the average earnings of workers. Because poverty thresholds increase over time with prices and incomes tend to grow faster than prices, poverty rates generally fall over time. Comparing Social Security benefits to the average wage shows whether beneficiaries are falling behind workers. The analysis adjusts income for family size and composition using the equivalence measures calculated for the US Census Bureau's supplemental poverty measure (Short 2013).

Our replacement measure compares Social Security benefits and total income to average lifetime earnings. We compute average earnings over workers' top 35 earning years by indexing annual earnings to the growth in the economy-wide average annual wage, similar to the AIME measure used to compute Social Security benefits, except we split couples' earnings evenly between the partners in years in which they were married. We also show the share of 70-year-olds with income that does not equal at least 75 percent of their preretirement earnings, a common rule of thumb for defining adequate retirement income (Cosic, Johnson, and Smith 2018). For this comparison, we define preretirement earnings as the average annual earnings received from ages 50 to 59, and our measure of age-70 income includes earnings, partnership and S-corporation income; Social Security benefits; defined-benefit pension income; SSI; other cash benefits; and the annual income from an annuity valued at 80 percent of financial assets, including retirement accounts. The annuity measure of financial assets allows us to compare the value of defined-contribution plan assets with defined-benefit pension income. We measure both earnings and age-70 income in inflation-adjusted 2018 dollars and again split couples' earnings evenly between the partners in years in which they were married.

Our analysis also examines lifetime outcomes. We compute lifetime measures of Social Security taxes and benefits relative to lifetime earnings by 10-year birth cohorts and compare benefits with taxes for beneficiaries who survive to age 65. Lifetime taxes include both worker and employer payroll taxes plus the Social Security net investment income surtax included in Sanders's and Warren's plans. We calculate the present value of lifetime benefits, taxes, and earnings at age 65 using a 2.6 percent annual real discount rate. Projected lifetime benefits account for the age at which each person claims benefits and include disabled-worker benefits, retired worker benefits, and spouse and survivor benefits. We calculate per capita measures that split couple benefits, taxes, and earnings in years each person is married. By focusing on people who survive to age 65, we characterize the experience of

typical retirees with Social Security. However, a significant share of workers pay payroll taxes but do not survive long enough to collect retirement benefits. Social Security projections indicate that about 20 percent of men and 12 percent of women who were born in 1960 will die between ages 18 and 65 (Board of Trustees 2019); these early decedents disproportionately have low education and earnings (Favreault 2019). Analyses of the lifetime distributional effects of Social Security thus often include those who die before age 65.[27]

Our final set of analyses examines how the distribution of changes to taxes and benefits vary with income and lifetime earnings to determine how well each plan targets low-income beneficiaries and high-income taxpayers. We focus on outcomes in 2065, when the plans have fully phased in.

DYNASIM4

Our analysis of the candidates' Social Security reform proposals is based on DYNASIM4. The model starts with a nationally representative sample of individuals and families in 2006 and ages them year by year, simulating key demographic, economic, and health events. For example, DYNASIM4 projects that each year, some people in the sample get married, have a child, or find a job. The model projects that other people become divorced or widowed, stop working, begin collecting Social Security, become disabled, or die. These transitions are based on probabilities generated by carefully calibrated equations estimated from national household survey data. The equations account for important differences in how likely various experiences are depending on gender, education, earnings, and other characteristics. Other equations in DYNASIM4 project annual earnings, savings, and home equity. The model includes detailed Social Security, SSI, health insurance, and income tax calculators that combine historical and projected program rules with projections of lifetime earnings, disability and health status, and household income and wealth to project Social Security retirement and disability benefits, Medicare benefits, SSI and other benefits, and tax liabilities.

The baseline model projects current-law program rules into the future, including the sunset of tax provisions in the 2017 Tax Cut and Jobs Act. We also assume that current indexing of income tax parameters and government benefits continue indefinitely. For consistency with Social Security's projections about program revenues and payments, we generally use the same assumptions that the Social Security and Medicare trustees used in their 2019 projections.

DYNASIM4 has been rigorously validated, and its projections align closely with those developed by the Social Security actuaries (Smith et al. 2018). One area in which we deviate from the actuaries, however, is our projection of revenues generated by the income taxation of Social Security benefits.

Because we assume that current law continues indefinitely, we hold the income thresholds for the taxation of Social Security benefits, which have not changed since they were created in 1983, at their current levels throughout the projection period. Consequently, we project that revenue from taxing Social Security benefits increases as inflation and productivity growth raises income. Our projections show that between 2027 and 2095, this revenue as a share of total benefits paid will grow from 5 percent to 8.5 percent. By contrast, the Social Security actuaries project that income tax collections as a share of benefits paid will increase over the same period from 5 percent to 5.6 percent (Social Security Administration 2019c).[28]

Urban Institute researchers have used DYNASIM extensively to evaluate programs and policies affecting older adults (including Social Security, Medicare, long-term services and supports, and employer-provided pensions) and the potential impact of reforms. Studies have examined Social Security and pension reform proposals from the Bipartisan Policy Center's Commission on Retirement Security and Personal Savings (Bipartisan Policy Center 2016), the National Commission on Fiscal Responsibility and Reform (Favreault and Karamcheva 2011), and the President's Commission to Strengthen Social Security (Favreault et al. 2004).[29]

Behavioral Assumptions

Our analysis incorporates various assumptions about how employers and workers would respond to the tax changes proposed by the Democratic candidates. Following most other analysts, including the Congressional Budget Office (2015), Tax Policy Center,[30] Social Security Administration (2009), Tax Foundation (Watson and Miller 2020), Joint Committee on Taxation, and the US Treasury's Office of Tax Analysis, we assume that workers bear the full burden of the Social Security payroll tax, including the employer portion. As a result, any increase in the employer payroll tax would lead employers to reduce the wages and salaries they pay workers by an equivalent amount so employer payroll costs do not change. We also assume that an increase in the payroll tax rate would lead workers and their employers to shift some employee compensation from taxable salaries to tax-exempt fringe benefits to reduce tax burdens, especially for high-wage earners, who would be more willing to accept that trade-off.[31] For workers with earnings above the threshold for the second tier of the contribution base, we shift between 1 and 10 percent of newly taxed earnings into tax-exempt compensation, depending on how much additional payroll tax workers would pay.[32]

Tax hikes often encourage taxpayers to shift some of their investments into assets taxed at lower rates to reduce their tax liability, limiting revenue raised by investment tax increases. Capital gains

taxes are particularly susceptible to tax avoidance behavior because taxpayers can easily reduce or delay realized capital gains (Leiserson 2020). Our analysis captures this tendency by assuming that investors reconfigure their investment portfolio to reduce their tax liabilities when taxes on investment income increase. Following the Tax Policy Center,[33] for capital gains, we assume a −1.1 elasticity of taxable income with respect to the tax rate in the first year of a tax change and a −0.7 elasticity each year thereafter. We use a −0.175 elasticity on other investment income for taxpayers in the top 1 percent of the income distribution. However, Sanders's proposal treats gifts and bequests of appreciated property as realization events (so that people would pay capital gains taxes on any accrued gains when they make a gift during their lifetime or leave a bequest upon death). Because this change reduces the benefit of holding appreciated assets until death, the Tax Policy Center reduces the capital gains elasticity to −0.4 at a 20 percent tax rate. Warren's proposal would apply carryover basis to bequests, so the Tax Policy Center reduces the elasticity on capital gains to −0.55 at a 20 percent tax rate.

Changes to Social Security benefits and taxes would affect economic growth by shifting work and savings incentives and hence work, spending, and saving decisions. Workers, especially those near retirement, may consider the longer-term impacts of Social Security reforms on future retirement income as well as the immediate impact on take-home pay. Aggregating the work, savings, and consumption choices of all families in the economy could significantly raise or lower prices for labor and returns to capital and shift the macroeconomy. Using a complex overlapping generations model, the Penn Wharton Budget Model team projects that the economy would grow faster under most Social Security proposals that increase program revenue than under current policy (Penn Wharton Budget Model 2019). They find that reforms that, unlike the plans we are examining, combine progressive benefit reductions with tax increases would spur the most economic growth. They also conclude that reforms that introduce "donut holes" without increasing benefits for higher-income individuals would reduce growth more than reforms that simply increase the existing payroll tax rate.

We do not integrate macroeconomic effects into our analysis. These effects, which are difficult to incorporate into a complex dynamic microsimulation model, are unlikely to significantly change the projected distributional impact of potential policy reforms (Leiserson 2017), which is the focus of our analysis.

How Would the Plans Affect Social Security Finances?

Table 3 summarizes the impact of each candidate's Social Security reform plan on Social Security's long-term finances as well as the impact of each individual plan provision if enacted alone. The table reports how each plan would change Social Security's long-term actuarial balance through 2093, expressed as a percentage of taxable payroll. The impacts of each individual provision do not sum to the total impact because many provisions interact with each other. For example, Warren's proposal to increase payments to all Social Security beneficiaries by $200 a month reduces the financial impact of the minimum benefit and increases the impact of the COLA change. The appendix to this report provides more details on the long-term cost estimates of the candidates' Social Security plans when each provision is implemented alone. The appendix also includes figures comparing the proposals' cost, noninterest income, and expenditures with current law from 2019 to 2095.

TABLE 3

Impact on Social Security's Long-Term Actuarial Balance and Trust Fund Exhaustion Year

Actuarial balance is expressed as a percentage of taxable payroll, 2019–93

Impact on long-term actuarial balance	Biden	Buttigieg	Klobuchar	Sanders	Warren
Total, including interaction effects	*0.68*	*2.39*	*1.81*	*2.12*	*2.70*
Revenue increases					
Increase contribution base	1.84	1.97	2.05	2.07	2.42
Tax investment income				1.03	2.21
Include income from S corporations, partnerships, and LLCs					0.25
Automatically increase payroll tax to insure solvency		2.24			
Benefit increases					
Increase benefits by $200/month					-0.76
Increase the first bend point in the benefit formula				-0.38	
Increase the minimum benefit	-0.20	-1.00		-0.21	-1.00
Increase the COLA by tying to the CPI-E	-0.37			-0.37	-0.37
Increase payments to long-term beneficiaries	-0.19				
Increase survivor benefits	-0.12		-0.12		-0.12
Provide caregiver credits	-0.12	-0.51	-0.12		-0.30
Repeal the WEP and GPO	-0.15				-0.15
Add student benefits				-0.05	-0.06
Remove minimum age for disabled survivor benefits					-0.03
Provide job training benefits					-0.02
Projected trust fund exhaustion year	**2040**	**NA**	**2061**	**2076**	**NA**

Source: DYNASIM4 ID980.

Notes: COLA = cost-of-living adjustment; CPI-E = consumer price index for the elderly; GPO = Government Pension Offset; NA = not applicable; SSI = Supplemental Security Income; WEP = Windfall Elimination Provision. Cells are blank when candidates did not include a provision in their plan. Estimates are for scheduled scenarios for each plan. Components do not sum to the totals because many of the plan provisions interact with each other.

Using the 2019 intermediate demographic and economic assumptions adopted by the Social Security trustees, DYNASIM4 projects that Social Security currently faces a 75-year actuarial deficit of 2.59 percent of taxable payroll. DYNASIM4 also projects that Social Security's combined trust funds will run out in 2035.[34] Plans must raise the program's long-term actuarial balance to achieve solvency over the 75-year projection period, though the timing and size of revenue and expenditure changes affect actuarial balances, interest income, and program solvency.

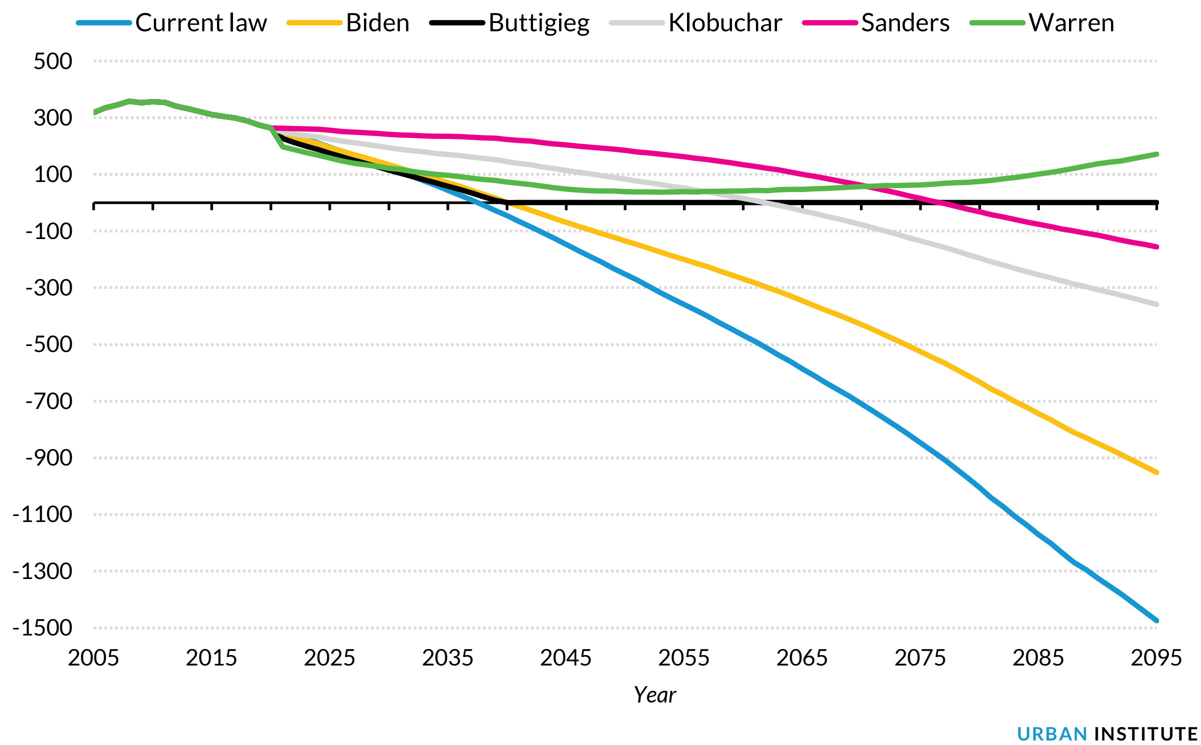
Of the five plans we analyze, Warren's proposal would improve Social Security finances most, increasing the long-term actuarial balance by about 2.70 percent of taxable payroll. Ignoring any potential macroeconomic impacts, we project that her plan is solvent over the 75-year projection period, with a positive and growing actuarial balance at the end of the 75-year projection horizon (figure 1). Although her plan would increase benefits more than any other plan we analyze, her plan would also increase program revenues much more than the other plans, mainly because it would increase the payroll tax rate and impose a substantial tax on investment income. We project that Buttigieg's plan would increase Social Security's long-term actuarial balance by only 2.39 percent of taxable payroll, but it achieves solvency because it would automatically increase the payroll tax rate for high earners to collect the revenue needed to pay specified benefits. This provision would raise the payroll tax rate by 15.0 percentage points on earnings above the current-law contribution and benefits base in 2040, 19.2 percentage points in 2070, and 14.6 percentage points in 2093.

None of the other plans would fully close Social Security's long-term financing gap. We project that Sanders's plan would come closest, increasing the long-term actuarial balance by about 2.12 percent of taxable payroll and significantly adding to trust fund assets. Under his plan, however, trust fund reserves would be exhausted around 2076, requiring a permanent 7 to 11 percent benefit reduction beginning that year unless Congress took other action to balance the program. Under Klobuchar's plan, Social Security's reserves would be depleted around 2061, requiring a permanent 9 to 12 benefit percent reduction beginning that year if Congress did not otherwise act. Biden's plan, which includes the smallest payroll tax increase of the proposals we analyze, would have the weakest impact on Social Security's finances, increasing the long-term actuarial balance by 0.68 percent of taxable payroll and delaying the timing of trust fund depletion by about five years, to 2040. His plan would reduce the projected benefit cuts that would be necessary that year to balance program revenue and outlays, without further Congressional action, to 13 to 17 percent, compared with 20 to 24 percent under current law (Board of Trustees 2019). Next, we provide more detail on how each candidate's plan would affect Social Security revenue and costs.

FIGURE 1

Projected Trust Fund Ratio, 2005–95 (%)

Current law and each reform plan, under scheduled scenarios



Source: DYNASIM4 ID980.

Notes: The trust fund ratio is defined as the asset reserves at the beginning of a year expressed as a percentage of the cost during the year.

Impact on Program Revenue

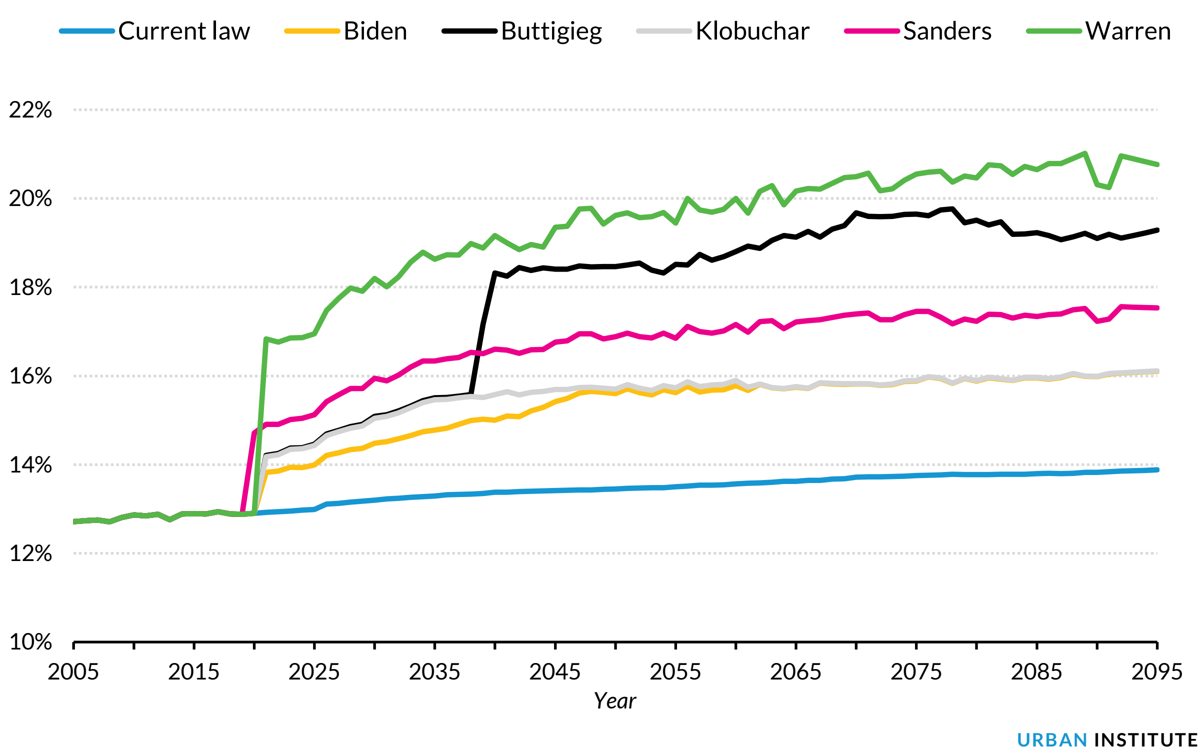
All five candidates' plans would significantly increase Social Security revenue over what the program would receive under current law (figure 2). We project that Warren's plan would increase revenue significantly more than the others, expanding Social Security income in 2065 from 13.6 percent of taxable payroll to 20.2 percent, a 48 percent increase. This growth comes from increasing the contribution base; boosting the payroll tax rate on workers with high earnings; and imposing a substantial new tax on investment income and active participants in S corporations, partnerships, and limited liability companies. In 2021, Warren's plan would exclude annual earnings between $142,200 and $250,000 from the payroll rate, but DYNASIM4 projects that this "donut hole" in the payroll contribution schedule would disappear in 2035 when inflation and real earnings growth raises the cap on the first contribution tier to $250,800. Sanders's plan would also raise substantial new revenues but would raise less than Warren's plan because it taxes high earners and investment income at a lower rate and taxes a narrower range of investment income.

Buttigieg's plan would also significantly raise Social Security revenues by increasing the contribution base and automatically increasing the payroll tax rate on workers with high earnings to achieve program solvency without cutting benefits. We project that this provision would require an additional 15 percent tax on earnings above the first-tier contribution base in 2040; that surtax would increase to 20 percent in 2078 and then fall to 15 percent by 2095.[35] Under Buttigieg's plan, Social Security revenues would reach 19.1 percent of taxable payroll in 2065.

FIGURE 2

Noninterest Income as a Percentage of Taxable Payroll, 2005–95 (%)

For current law and each reform plan, under scheduled scenarios



Source: DYNASIM4 ID980.

Biden's plan would raise less revenue than the other plans because the additional income would come only from extending the payroll tax to earnings that exceed $400,000 each year, whereas the other plans would tax annual earnings above $250,000. In 2021, the payroll tax expansion would hit only 0.65 percent of workers under Biden's plan compared with 1.66 percent under the plans proposed by the other candidates. However, we project that Biden's plan would tax all earnings by 2048, when inflation and real earnings growth raises the cap on the first contribution tier to $408,600. After that year, Biden's plan would collect as much Social Security payroll tax revenue as Klobuchar's plan. Under Biden's plan, Social Security revenues would reach 15.7 percent of taxable payroll in 2065, 16 percent

more than under current law. Klobuchar's plan would raise slightly more revenue than Biden's plan because the benefit enhancements in her plan would generate somewhat more income tax revenue.

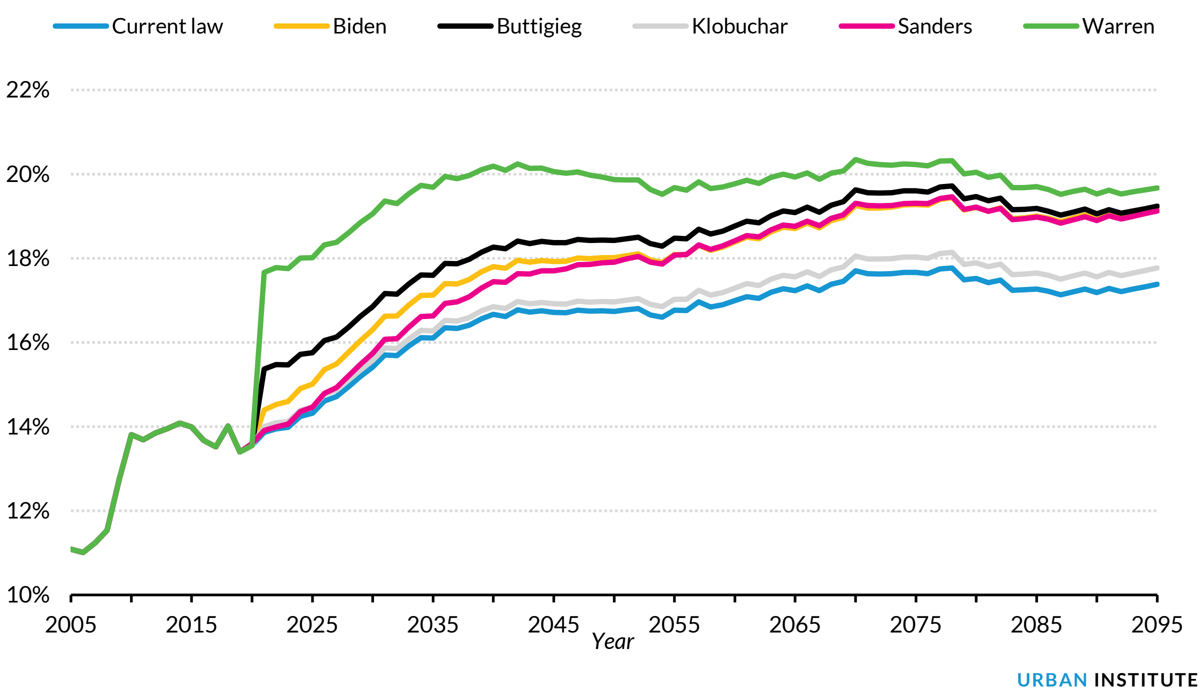
Impact on Program Costs

All five candidates' plans would increase scheduled Social Security costs compared with current-law benefits (figure 3). Klobuchar's plan includes the smallest benefit enhancements, increasing program cost 1 percent in 2021 and 2.2 percent in 2095. Warren's plan includes the largest benefit enhancements, increasing program costs 27 percent in 2021 and 13 percent in 2095. In 2035, just as the program's trust funds are projected to run out under current law, Social Security costs would total 19.7 percent of taxable payroll under Warren's proposal compared with 16.1 percent under current law. The other plans would not expand Social Security as much. As a share of taxable payroll, program costs in 2035 would reach 17.6 percent under Buttigieg's plan, 17.1 percent under Biden's plan, 16.6 percent under Sanders's plan, and 16.3 percent under Klobuchar's plan. However, neither current law nor many of the candidates' plans would raise enough revenue to fully fund scheduled benefits.

FIGURE 3

Social Security Cost as a Percentage of Taxable Payroll, 2005–95

For current law and each reform plan, under scheduled scenarios



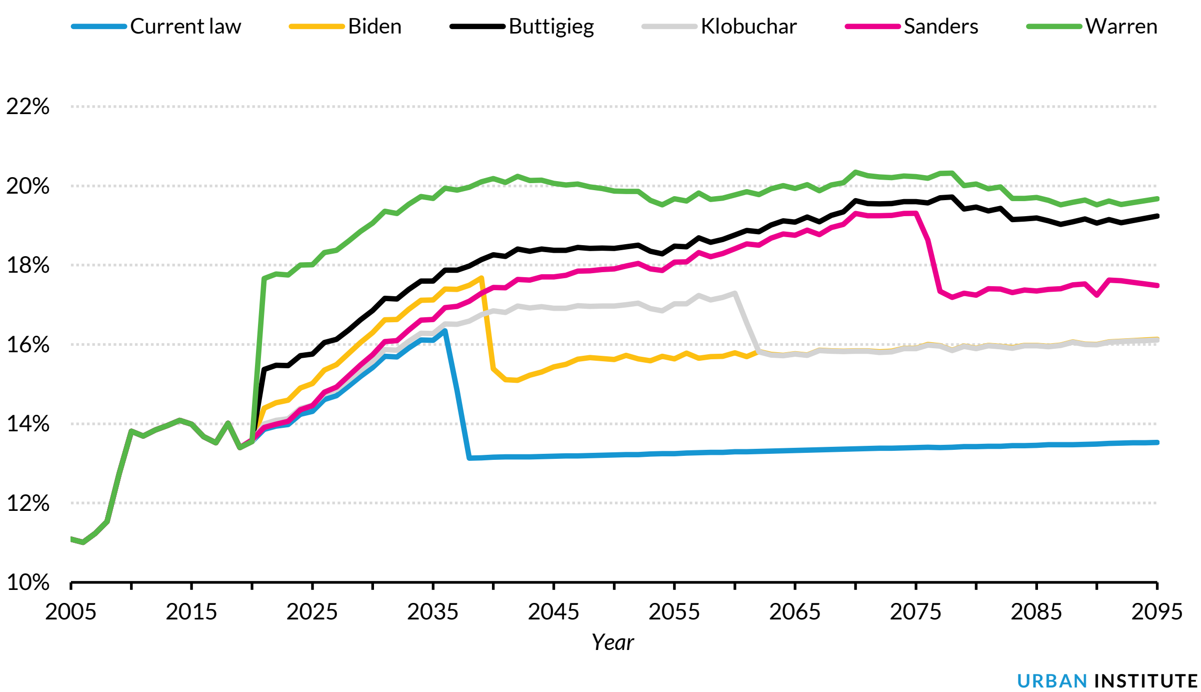
Source: DYNASIM4 ID980.

Under current law, if Congress fails to take further action, Social Security must permanently cut benefits roughly 20 to 23 percent after 2035 when the trust fund is exhausted and the program will have to finance payments solely from revenue collected from income taxes on Social Security benefits and payroll taxes, as shown by the blue line in figure 4. Using similar payable benefit adjustments, we project that benefits would fall 12 to 17 percent after 2040 under Biden's plan, 9 to 13 percent after 2061 under Klobuchar's plan, and 7 to 12 percent after 2076 under Sanders's plan. Nonetheless, all the Democratic candidates' plans we examine would pay more benefits than the current law and would extend the life of the trust fund.

FIGURE 4

Social Security Cost as a Percentage of Taxable Payroll by Year and Option, 2005–95

Under current law and each reform plan, under payable scenarios



Source: DYNASIM4 ID980.

Notes: We reduce scheduled benefits when the trust funds are exhausted. This occurs after 2035 for current law, 2040 for Biden's plan, 2061 for Klobuchar's plan, and 2075 for Sanders's plan.

In 2065, under current law, Social Security would be able to finance benefits worth only 13.3 percent of taxable payroll, although payments scheduled by the benefit formula would cost 17.2 percent of taxable payroll. Using the stylized payable version of each reform plan, we project that Social Security costs in 2065 would reach 19.9 percent of taxable payroll under Warren's plan, 19.1 percent under Buttigieg's plan, and 18.8 percent under Sanders's plan. Costs under the stylized payable versions

of Biden's and Klobuchar's plans would fall to 15.8 percent of taxable payroll in 2065, because neither plan extends solvency to 2065, forcing benefit cuts without further Congressional action. Nonetheless, Social Security would be able to finance more benefits under these plans than under current law. The following sections describe the cost components of each plan.

INCREASE THE MINIMUM BENEFIT

Increasing the minimum benefit is the most expensive item in Buttigieg's and Warren's plans. We project that, if enacted alone, this change would reduce Social Security's long-term actuarial balance by 1.0 percent of taxable payroll. Biden's and Sanders's plans would also increase the minimum benefit, but their minimum benefit would cost less than one-third as much over the next 75 years because they would only provide this additional payment to new beneficiaries, not people already collecting.

Buttigieg's and Warren's minimum-benefit provision would increase Social Security benefits for 36 percent of all beneficiaries in 2025, including 46 percent of beneficiaries in the bottom benefit quintile. It would increase benefits for 46 percent of women and 85 percent of beneficiaries age 85 and older. The provision would increase Social Security payments 36 percent for beneficiaries who receive the minimum benefit and reduce the poverty rate for beneficiaries by 2.3 percentage points.

Biden's and Sanders's minimum-benefit provision would increase Social Security benefits for only 2 percent of beneficiaries in 2025 because it would cover only those beneficiaries who recently began collecting, and it would reduce the poverty rate for beneficiaries by less than 1 percentage point. By 2065, when the minimum benefit would cover most beneficiaries, 14 percent would receive the minimum benefit, including 43 percent of those in the bottom benefit quintile. However, the impact on the poverty rate would still be small that year, because the share of beneficiaries projected to have incomes below the FPL declines over time as productivity growth raises average earnings and Social Security benefits. Compared with benefits scheduled under current law, in 2065 Biden's and Sanders's minimum-benefit provision would reduce poverty 0.3 percentage points. However, their provision would raise lifetime benefits more for beneficiaries in the bottom fifth of the lifetime earnings distribution than Buttigieg's and Warren's provision, because Biden and Sanders would index the minimum benefit to average wage growth rather than the growth in prices.

Although the minimum-benefit provisions would target workers with long employment histories, they would also increase benefits for spouses and survivors with few or no work years. Some of the biggest gains in Buttigieg's and Warren's proposals would go to spouses and widows with few work years who were married to workers employed for 30 or more years.

PROVIDE A MONTHLY $200 BONUS

The second most expensive component of Warren's plan is the provision to boost benefits across the board by $200 a month. We project that, if enacted alone, this bonus would reduce Social Security's long-term actuarial balance by 0.76 percent of taxable payroll. In 2025, this provision would increase average benefits 11 percent (about $1,200 a year in 2018 dollars). The relative impact would be larger for low-income beneficiaries, with benefits increasing 26 percent for the bottom fifth of beneficiaries and only 7 percent for the top fifth. In 2025, the extra $200 a month would reduce the poverty rate for full-year beneficiaries 2.8 percentage points, from 7.3 percent to 4.5 percent.

Because Warren's plan does not index the $200 monthly bonus for inflation, its buying power would decline over time. In 2065, it would raise average benefits 3 percent, or $700 per year in 2018 dollars. The largest percentage benefit increase would continue to go to those receiving low benefits, with beneficiaries in the bottom benefit quintile experiencing a 6 percent benefit increase, compared with a 2 percent increase for those in the top benefit quintile.

INCREASE THE FIRST BEND POINT IN THE BENEFIT FORMULA

The most expensive component of Sanders's plan is the provision to gradually increase the first bend point in the benefit formula 15 percent. We project that, if enacted alone, this provision would reduce Social Security's long-term actuarial balance by 0.38 percent of taxable payroll. Under this provision, the first bend point would increase from $2,035 to $2,340 in 2039. This provision would increase payments to all beneficiaries whose initial benefits were calculated under the new formula, but benefits for current beneficiaries would not change. Consequently, only 3 percent of beneficiaries would receive higher benefits in 2025. Among beneficiaries with a benefit change, average annual benefits in 2025 would increase only $37 (in 2018 dollars). The average benefit hike would be larger for beneficiaries in the top benefit quintile ($91) and lower for beneficiaries in the bottom benefit quintile ($26).

In 2065, most beneficiaries would receive benefits calculated under the new formula. Compared with 2065 scheduled benefits, the average Social Security benefit would increase about 4 percent, or $1,157 in 2018 dollars, under this provision. The absolute benefit increase would be larger for beneficiaries in the top benefit quintile ($1,391 in 2018 dollars) than for beneficiaries in the bottom quintile ($814), but the percentage increase would be smaller for top-quintile beneficiaries (3 percent versus 6 percent).

INCREASE THE COST-OF-LIVING ADJUSTMENT

Three of the candidates propose increasing the COLA by tying it to changes in the CPI-E (the price index for elderly consumers) instead of the CPI-W (the index for workers). We project that this provision, included in Biden's, Sanders's, and Warren's plans, would on its own reduce Social Security's long-term actuarial balance by 0.37 percent of taxable payroll.

Because the COLA cumulates over time, the impact of the COLA increase would most affect long-term beneficiaries. Compared with 2065 scheduled benefits, we project that this change would increase average benefits among beneficiaries age 85 and older 5.7 percent, or $1,625 in 2018 dollars. Widows would also experience substantial gains, with their 2065 average benefits increasing 4.5 percent, or $1,364 in 2018 dollars.

INCREASE PAYMENTS TO LONG-TERM BENEFICIARIES

The provision in Biden's plan to increase payments to beneficiaries who have been collecting for at least 20 years would reduce Social Security's long-term actuarial balance by 0.19 percent of payroll if enacted alone. We project that 39 percent of beneficiaries would get a benefit increase in 2025 under this provision, with an average increase of 3 percent ($483 a year in 2018 dollars). Nearly all beneficiaries age 80 and older would receive a benefit increase, along with many younger beneficiaries who first became entitled as disabled workers. We estimate that the size of the increase would be similar across different income, earnings, marital status, education, and racial groups. The benefit increase would be too small to lift many long-term beneficiaries out of poverty, reducing poverty rates among people age 85 and older by less than 1 percentage point in 2025.

PROVIDE SOCIAL SECURITY CREDITS TO CAREGIVERS

Providing Social Security credits to workers who care for children, people with disabilities, and older family members is an important cost driver in the Social Security reform plans proposed by Biden, Klobuchar, Warren, and especially Buttigieg. Buttigieg's caregiver provision is the most expensive, costing 0.51 percent of taxable payroll over 75 years, because all caregivers of children under 18 could qualify and the credit would equal 100 percent of average earnings, which is much higher than median earnings. Warren's caregiver provision would cost only 0.30 percent of taxable payroll because it would not cover workers caring for children age 6 and older. Klobuchar's caregiver provision, which also restricts child caregivers to those with children under age 6 but limits credits to 50 percent of the average earnings, which is lower than median earnings, would cost only 0.12 percent of taxable payroll. Biden's caregiver provision restricts child caregivers to those with children under age 12 and provides a credit equal to 50 percent of the average earnings, but it reduces the credit amount by 50 cents for each dollar earned (less

than the dollar-for-dollar earnings offset in the other caregiver provisions). Biden's caregiver provision would cost only 0.12 percent of taxable payroll over 75 years because his plan allows only five caregiver credit years that are not limited in the other caregiver plans.

A caregiver credit that does not retroactively credit workers for past care would not significantly increase average Social Security benefits until years after being introduced, because workers are often decades away from retirement when they are caring for young children. We project that the share of beneficiaries who would gain from caregiver credits under Buttigieg's plan, which is the most expansive, would increase from 2 percent in 2025 to 45 percent in 2065. In 2065, 36 percent would benefit from Biden's caregiving credits, 33 percent of beneficiaries would benefit from Warren's caregiving credits, and 27 percent would benefit from Klobuchar's caregiver credits. Although Warren's and Klobuchar's plans use the same eligibility criteria for caregiver credits, the smaller credit in Klobuchar's plan would reduce its reach by limiting the number of caregivers who would replace an employment year in the AIME calculation with a caregiver credit year.

The caregiver credit would especially help families that include a worker with a disability. Workers with a disability often experience lost wages, receive lower-than-average earnings, and are more likely than better-abled adults to work intermittently. As a result, they often earn only limited Social Security benefits based on their own earnings and often rely on spousal and survivor benefits in old age. Moreover, many of their spouses must reduce their work hours to provide care. In addition to increasing Social Security benefits for caregivers, caregiver credits would also increase the spousal, survivor, and family benefits paid to caregivers' disabled spouses and dependent children.

Beneficiaries in the bottom benefit quintile would gain most from the caregiver credit because credits are tied to the average wage. Compared with 2065 benefits scheduled under current law, the credit in Buttigieg's plan would increase caregivers' average benefits 50 percent (or $5,590 in 2018 dollars) for beneficiaries in the bottom benefit quintile, compared with 1 percent (or $465) for beneficiaries in the top benefit quintile. Female beneficiaries would gain 17 percent on average; male beneficiaries would gain 8 percent. Beneficiaries who collect disability benefits would gain 26 percent on average. Patterns would be similar for Biden's, Klobuchar's, and Warren's plans, although gains under theirs would be smaller.

INCREASE SURVIVOR BENEFITS

Increasing Social Security's survivor benefits for two-earner couples, part of Biden's, Klobuchar's, and Warren's plans, would modestly raise program costs, reducing Social Security's long-term actuarial balance by 0.12 percent of taxable payroll.

This provision would benefit only beneficiaries with a qualifying marriage, including surviving spouses and surviving divorced spouses whose marriage lasted at least 10 years. In 2025, this provision would increase benefits for 31 percent of widowed beneficiaries and 5 percent of divorced beneficiaries. Among those who would gain, average benefits would increase 15 percent overall ($2,560 a year in 2018 dollars); benefits for bottom-quintile beneficiaries would increase 21 percent, while benefits for top-quintile beneficiaries would increase 12 percent. The probability of benefiting from this provision increases with age as widowhood becomes more likely. Because widowhood generally occurs near the end of life, the benefit increase would not generally last long. Increasing survivor benefits would reduce poverty rates by less than 1 percentage point in 2025.

REPEAL THE WINFALL ELIMINATION PROVISION AND GOVERNMENT PENSION OFFSET

Both Biden's and Warren's plans would repeal the WEP and GPO (provisions that reduce Social Security payments to certain retired government employees) at a projected 75-year cost of 0.15 percent of taxable payroll. Although these provisions affect relatively few beneficiaries, they often substantially reduce Social Security benefits for those affected. We estimate that in 2025, eliminating the WEP and GPO would increase Social Security benefits for 4.5 percent of beneficiaries and that the annual increase for those affected would average about $7,300 (in 2018 dollars). Affected beneficiaries in the bottom fifth of the lifetime earnings quintile would receive an additional $3,600 annually; those in the top fifth of the lifetime earnings quintile would receive an additional $8,900 annually.

The share of beneficiaries affected by the WEP and GPO will decline over time because the 1983 Social Security reforms expanded Social Security coverage to include all newly hired federal government workers (Social Security Administration 1984). We project that repealing the WEP and GPO will affect only 2 percent of beneficiaries in 2065, compared with benefits scheduled under current law. Affected beneficiaries will gain about $6,900 (in 2018 dollars). As in earlier years, high earners would gain more from this provision than low earners.

Beneficiaries affected by the WEP and GPO have access to employer-provided pensions through their government employment, and most worked for many years. These workers and their families typically have incomes above the FPL, so repealing the WEP and GPO would not materially affect the poverty rate.

ADD STUDENT BENEFITS

Sanders's and Warren's plans would expand Social Security benefits to students older than age 18. Sanders's provision, which extends benefits to dependent full-time students as old as 22, would cost about 0.05 percent of taxable payroll over 75 years if enacted alone. Warren's provision, which extends benefits to age 24, would cost about 0.06 percent of taxable payroll.

We estimate that expanding benefits to full-time students through age 22 would add about 400,000 beneficiaries to Social Security's rolls in 2021, an 8.4 percent increase in child beneficiaries, and cost $3.7 billion, an 8 percent increase in child benefits. Expanding benefits through age 24 would add about 553,000 student beneficiaries in 2021 and cost $5.1 billion. It would increase incomes most for families with a disabled worker beneficiary, because they are more likely than families with an aged beneficiary to have college-age children. Because Black workers are more likely than white workers to be disabled or widowed at younger ages, Black families would disproportionately benefit from this policy. Because people are more likely to attend college if their parents attended, well-educated beneficiaries would be more likely than less-educated beneficiaries to collect child benefits for their dependent students.

EXPAND SURVIVOR BENEFITS FOR PEOPLE WITH DISABILITIES

If enacted alone, Warren's plan's provision to remove the minimum age and early reduction factors for survivor benefits to people with disabilities would reduce Social Security's long-term actuarial balance by about 0.03 percent of taxable payroll. We project that disabled widow beneficiaries would account for about 1 percent of all Social Security beneficiaries in 2025 and that Warren's plan would increase their average annual benefits by about $4,100 that year, a 25 percent increase. The percentage benefit increase would be larger for beneficiaries in the lowest benefit quintile (37 percent) than for beneficiaries in the highest benefit quintile (16 percent). Although the option affects relatively few beneficiaries, it represents a sizeable increase in benefits for this low-benefit group.

PROVIDE JOB-TRAINING BENEFITS

Warren's proposal would exclude up to three years spent in job training and apprenticeship programs from a worker's AIME calculation. This adjustment would raise participants' future Social Security benefits by excluding some zero-earnings years from the AIME calculation.[36] Because Warren's provision would not provide any immediate financial incentive to receive training, we assume that her plan would not significantly increase training. For workers participating in training programs, we subtract up to three years of earnings from their AIME calculation.

We project that if enacted alone, Warren's training benefit would reduce Social Security's long-term actuarial balance by 0.02 percent of taxable payroll. Because training is more common at younger ages and the benefit would not be available to current beneficiaries, its impact on Social Security benefits accrues slowly. Compared with current-law-scheduled benefits, we project that 4 percent of Social Security beneficiaries would have greater benefits in 2055 and 8 percent would have greater benefits in 2065. In 2065, the average annual Social Security benefit increase for people with a change would be about $735 (in 2018 dollars), a 3 percent increase in benefits. The gains are similar across

racial and ethnic groups and across income groups. This provision would only minimally reduce poverty rates among older people and people with disabilities. Most of the workers who participate in training programs would otherwise have incomes that exceed the FPL.

How Would Household Earnings and Taxes Change?

Each candidate's plan would reduce cash compensation for workers with earnings above the second-tier payroll tax threshold. Because we assume the amount that employers are willing to pay in labor costs is fixed, the increase in the employer payroll tax imposed by each plan would lead employers to reduce their wage and salary payments to workers. The higher payroll taxes also encourage workers and their employers to shift some compensation into tax-exempt fringe benefits. Cash compensation for workers with earnings below the second-tier tax threshold would not change, however. The overall impact of the plans on cash compensation would be relatively small. Warren's plan, which would have the largest impact because it would extend the payroll tax to annual earnings above $250,000 and impose a higher tax rate on those earnings, would reduce aggregate cash compensation by 1.25 percent in 2021 (table 4). Biden's plan would reduce cash compensation least (0.87 percent) because it would raise payroll taxes only on annual earnings above $400,000. Buttigieg's, Klobuchar's, and Sanders's plans, which would extend the payroll tax to annual earnings above $250,000 but would not increase the tax rate, would each reduce aggregate cash compensation by 1.13 percent in 2021. The impacts would be much larger, however, for workers with substantial earnings. Warren's plan would reduce 2021 cash compensation more than 15 percent for workers earning more than $5 million a year, and Biden's plan would reduce their cash compensation about 14 percent.

TABLE 4

Percent Change in Cash Compensation, 2021

By current-law total compensation and reform plan

Total compensation	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	-0.87	-1.13	-1.13	-1.13	-1.25
$1 to $200,000	0.00	0.00	0.00	0.00	0.00
$200,001 to $500,000	-0.07	-0.80	-0.80	-0.80	-0.96
$500,001 to $1 million	-3.47	-6.21	-6.21	-6.21	-7.48
$1 million to $1.5 million	-9.07	-11.53	-11.53	-11.53	-12.66
$1.5 million to $2 million	-11.04	-12.23	-12.23	-12.23	-12.99
$2 million to $5 million	-13.04	-13.79	-13.79	-13.79	-14.65
$5 million to $10 million	-14.34	-14.61	-14.61	-14.61	-15.52
More than $10 million	-14.74	-14.86	-14.86	-14.86	-15.78

Source: DYNASIM4 ID980.

Notes: The percent change is calculated relative to the current law for workers with positive earnings in 2021. Total compensation includes salaries and wages, self-employment income, tax deferred contributions to employer retirement plans, employer-paid Social Security and Medicare payroll taxes, and employer paid health insurance premiums, expressed in 2018 inflation-adjusted dollars. Individuals are grouped by current-law total compensation.

We project that Warren's plan would reduce 2021 household income by $205.7 billion, including $132.0 billion in labor income and $73.8 billion in investment income (table 5). The decline in investment income arises from the plan's substantial increase in investment taxes, which we project would reduce investment activity. The projected decline in household income is about half as much under Biden's, Buttigieg's, and Klobuchar's plans, which would not impose any additional investment taxes. We project that Sanders's plan, which would raise investment taxes but not by as much as Warren's, would reduce 2021 household income by $140.8 billion.

TABLE 5

Change in Household Income, 2021

By reform plan (billions of dollars)

	Biden	Buttigieg	Klobuchar	Sanders	Warren
Total	-92.1	-119.5	-119.5	-140.8	-205.7
Labor income	-91.9	-119.3	-119.3	-119.3	-132.0
Investment income	-0.1	-0.2	-0.2	-21.5	-73.8

Source: DYNASIM4 ID980.

Note: Table shows the change in before-tax income from assumed behavioral effects, relative to the current-law-payable scenario. The change in labor income reflects employers' lowering pay and shifting wages into noncash benefits.

All candidates' plans would increase taxes paid by households, although the impacts would vary substantially. We project that in 2021, total tax payments, including federal and state income taxes and payroll taxes, would increase 1.1 percent under Biden's plan, 1.6 percent under Klobuchar's plan, 1.7 percent under Buttigieg's plan, 3.2 percent under Sanders's plan, and 7.9 percent under Warren's plan (table 6). None of the plans would raise taxes for low-income households, and the tax increase for moderate-income households would be very small. All the plans, however, would raise taxes substantially for high-income households. For households with incomes of more than $1 million, Biden's plan would increase taxes between 3.2 and 5.6 percent, and Buttigieg's and Klobuchar's plans would increase taxes between 3.4 and 6.9 percent. Sanders's and Warren's plans would increase taxes on high-income households even more, because they would institute a Social Security tax on investment income. Warren's plan, which would impose a higher tax on investment income than Sanders's and would tax distributions from S corporations and partnerships, would increase taxes about 18.8 percent for households with incomes between $500,001 and $1 million and more than 30 percent for households with incomes above $10 million. All the candidates' plans would increase Social Security benefits compared with current law and, in turn, would boost taxable income and income tax liabilities. Projected tax increases that stem from higher benefits are distributed throughout the income distribution, except for beneficiaries with incomes below the tax thresholds.

TABLE 6

Percent Change in Taxes Paid by Current-Law Total Income, 2021

For each reform plan

Current-law total income	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	1.1	1.7	1.6	3.2	7.9
$1 to $5,000	0.0	0.0	0.0	0.0	0.0
$5,001 to $10,000	0.0	0.8	0.0	0.0	1.0
$10,001 to $15,000	0.0	0.4	0.0	0.0	0.6
$15,001 to $20,000	0.0	0.3	0.0	0.0	0.4
$20,001 to $25,000	0.0	0.1	0.0	0.0	0.3
$25,001 to $30,000	0.1	0.2	0.0	0.0	0.4
$30,001 to $40,000	0.2	0.3	0.0	0.0	0.7
$40,001 to $50,000	0.3	0.3	0.1	0.0	1.0
$50,001 to $75,000	0.3	0.4	0.0	0.0	1.2
$75,001 to $100,000	0.2	0.3	0.0	0.0	1.0
$100,001 to $200,000	0.2	0.1	0.0	0.0	0.7
$200,001 to $500,000	0.2	1.3	1.2	2.0	2.5
$500,001 to $1 million	2.8	6.5	6.5	10.0	18.8
$1 million to $1.5 million	5.4	6.9	6.9	10.5	23.7
$1.5 million to $2 million	5.6	6.1	6.1	10.1	24.9
$2 million to $5 million	3.4	3.8	3.8	8.1	26.6
$5 million to $10 million	3.2	3.4	3.4	10.3	30.0
More than $10 million	3.7	3.7	3.7	11.3	30.4

Source: DYNASIM4 ID980.

Notes: The percent change is calculated relative to the current law for all individuals in 2021. Total income includes adjusted gross income plus tax deferred contributions to pension plans, employer paid payroll taxes, employer-paid health insurance premiums, tax-exempt interest income, Social Security income excluded from adjusted gross income, Supplemental Security Income, and other nontaxable cash benefits, expressed in 2018 inflation-adjusted dollars. Individuals are grouped by current-law tax-unit total income. Total tax includes federal and state income taxes, Social Security and Medicare payroll taxes (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premiums. In 2021, all plans are payable as scheduled.

The tax increases associated with the candidates' plans would grow over time and extend further down the income distribution as wage growth subjects more earnings to the Social Security payroll tax (table 7). We project that in 2065, compared with the current-law-payable scenario, taxes would increase 2.4 percent under Biden's and Klobuchar's plans, 5.2 percent under Sanders's plan, and 10.3 percent under Warren's plan. Buttigieg's plan would increase taxes 8.7 percent in 2065, much more than in 2021, because its provision to automatically increase payroll taxes to keep Social Security solvent would have already been triggered. Nonetheless, the tax increases for households with no more than $200,000 in income would remain small and mostly stem from the additional Social Security benefits they would receive.

TABLE 7

Percent Change in Taxes Paid by Current-Law Total Income, 2065

For each reform plan, under payable scenarios

Current-law total income	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	2.4	8.7	2.4	5.2	10.3
$1 to $5,000	0.4	1.3	0.3	0.8	1.6
$5,001 to 10,000	1.4	3.2	0.8	2.0	3.5
$10,001 to $15,000	2.9	6.2	1.3	4.2	7.3
$15,001 to $20,000	2.7	5.8	1.5	4.2	7.6
$20,001 to $25,000	2.5	5.9	2.1	4.5	7.0
$25,001 to $30,000	2.4	5.4	2.1	4.9	6.7
$30,001 to $40,000	2.2	4.7	2.0	4.5	5.8
$40,001 to $50,000	1.9	4.4	1.7	4.2	5.2
$50,001 to $75,000	1.8	4.0	1.8	4.3	5.0
$75,001 to $100,000	1.8	4.1	1.9	4.8	5.5
$100,001 to $200,000	1.2	2.7	1.3	3.8	4.7
$200,001 to $500,000	1.5	4.3	1.6	3.3	5.1
$500,001 to $1 million	4.1	16.2	4.2	6.3	11.5
$1 million to $1.5 million	4.5	21.1	4.5	8.1	18.2
$1.5 million to $2 million	5.4	23.9	5.4	8.5	20.4
$2 million to $5 million	4.2	21.5	4.3	8.3	22.4
$5 million to $10 million	3.4	18.0	3.4	8.2	25.7
More than $10 million	3.0	14.9	3.0	11.0	29.0

Source: DYNASIM4 ID980.

Notes: The percent change is calculated relative to current-law payable for all individuals in 2065. Total income includes adjusted gross income plus tax deferred contributions to pension plans, employer-paid payroll taxes, employer-paid health insurance premiums, tax-exempt interest income, Social Security income excluded from adjusted gross income, Supplemental Security Income, and other nontaxable cash benefits. Individuals are grouped by current-law-payable tax-unit total income, expressed in 2018 inflation-adjusted dollars. Total tax includes federal and state income tax, Social Security and Medicare payroll taxes (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premiums.

Average total taxes as a percentage of total income would increase relative to current law under each candidate's plan, but the impacts would be small for all but the highest-income taxpayers. In 2021, the projected overall average tax rate would increase less than 1 percentage point for all plans except Warren's, and her plan would raise the overall average rate only 1.4 percentage points (table 8). The projected average tax rate would increase more substantially for households with incomes over $1 million, however. Under current law, households with income between $2 million and $5 million face an average total tax rate of 35.4 percent. We project that their average rate would increase to 37.7 percent under Biden's plan, 38.0 percent under Buttigieg's and Klobuchar's plans, 39.8 percent under Sanders's plan, and 47.7 percent under Warren's plan. Average tax rates are lower for some lower-income taxpayers who receive higher tax-exempt Social Security with no increase in tax liability.

TABLE 8

Average Total Tax Rate by Current-Law Total Income, 2021

For current law and each reform plan

Current-law total income	Current law	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	19.9	20.1	20.2	20.3	20.6	21.3
$1 to $5,000	4.7	4.7	4.4	4.7	4.7	4.2
$5,001 to 10,000	2.2	2.2	2.1	2.2	2.2	2.0
$10,001 to $15,000	2.5	2.4	2.2	2.4	2.5	2.1
$15,001 to $20,000	4.2	4.2	3.9	4.2	4.2	3.7
$20,001 to $25,000	5.9	5.9	5.6	5.9	5.9	5.4
$25,001 to $30,000	7.8	7.7	7.5	7.7	7.8	7.2
$30,001 to $40,000	9.5	9.5	9.3	9.5	9.5	9.1
$40.001 to $50,000	10.5	10.5	10.4	10.5	10.5	10.3
$50,001 to $75,000	12.8	12.8	12.7	12.8	12.8	12.6
$75,001 to $100,000	15.8	15.8	15.8	15.8	15.8	15.7
$100,001 to $200,000	19.1	19.1	19.1	19.1	19.1	19.1
$200,001 to $500,000	23.4	23.5	23.7	23.7	23.9	24.0
$500,001 to $1 million	27.7	28.5	29.6	29.6	30.7	33.5
$1 million to $1.5 million	30.9	32.9	33.7	33.7	35.1	40.0
$1.5 million to $2 million	32.8	35.3	35.9	35.9	37.4	43.2
$2 million to $5 million	35.4	37.7	38.0	38.0	39.8	47.7
$5 million to $10 million	33.1	35.1	35.2	35.2	38.0	46.0
More than $10 million	34.2	36.7	36.7	36.7	39.7	47.7

Source: DYNASIM4 ID980.

Notes: Table shows the average total taxes as a percentage of average total income for all families with positive total income in 2021. Total income is adjusted gross income plus tax deferred contributions to pension plans, employer-paid Social Security and Medicare payroll tax, employer paid health insurance premiums, tax-exempt interest income, Social Security income excluded from adjusted gross income, Supplemental Security Income, and other nontaxable cash benefits. Individuals are grouped by current-law tax-unit total income in 2018 inflation-adjusted dollars. Total tax includes federal and state income tax, Social Security and Medicare payroll tax (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premiums. In 2021, all plans are payable as scheduled.

Our simulations project that average tax rates will increase over time because the tax code now increases income tax thresholds by the change in the chained CPI, which we assume grows more slowly than average earnings.[37] Also, many of the tax cuts included in the Tax Cut and Jobs Act expire in 2025. We project that the overall average tax rate will reach 25.1 percent in 2065 under the current-law-payable scenario (table 9). Overall average tax rates would increase slightly more under all the candidates' plans, especially for higher-income households. As in earlier years, Warren's plan would increase average tax rates more than the other candidates' plans. Those higher tax revenues allow Warren's plan to significantly boost benefits and close Social Security's long-term financing gap.

TABLE 9

Average Total Tax Rate by Current-Law Total Income, 2065

For current law and each reform plan, under payable scenarios

Current-law total income	Current law	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	25.1	25.6	26.7	25.6	26.0	27.3
$1 to $5,000	5.2	3.6	2.8	4.6	3.6	2.9
$5,001 to 10,000	2.1	1.9	1.7	2.0	1.8	1.6
$10,001 to $15,000	2.8	2.5	2.1	2.5	2.3	2.1
$15,001 to $20,000	4.5	4.1	3.6	4.1	3.8	3.6
$20,001 to $25,000	6.3	5.9	5.5	5.9	5.5	5.4
$25,001 to $30,000	8.6	8.2	7.8	8.2	7.8	7.7
$30,001 to $40,000	11.3	11.0	10.6	11.0	10.7	10.6
$40.001 to $50,000	13.2	13.0	12.7	13.0	12.8	12.7
$50,001 to $75,000	13.9	13.8	13.6	13.8	13.7	13.6
$75,001 to $100,000	15.9	15.8	15.8	15.8	15.9	15.9
$100,001 to $200,000	20.7	20.7	20.8	20.7	20.9	21.1
$200,001 to $500,000	27.1	27.4	27.9	27.4	27.7	28.3
$500,001 to $1 million	32.5	34.5	37.7	34.5	35.2	37.2
$1 million to $1.5 million	33.8	36.7	41.2	36.7	38.0	42.0
$1.5 million to $2 million	35.4	38.6	43.8	38.6	39.8	44.7
$2 million to $5 million	35.2	38.4	43.3	38.4	40.1	46.0
$5 million to $10 million	36.4	39.2	43.6	39.2	41.3	49.1
More than $10 million	34.1	36.1	39.5	36.1	39.4	47.1

Source: DYNASIM4 ID980.

Notes: Table shows the average total taxes as a percentage of average total income for all families with positive total income in 2065. Total income is adjusted gross income plus tax deferred contributions to pension plans, employer-paid Social Security and Medicare payroll taxes, employer-paid health insurance premiums, tax-exempt interest income, Social Security income excluded from adjusted gross income, Supplemental Security Income, and other nontaxable cash benefits. Individuals are grouped by current-law-payable tax-unit total income in 2018 inflation-adjusted dollars. Total tax includes federal and state income tax, Social Security and Medicare payroll tax (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premiums.

How Would Federal Revenue and Spending Change?

By raising payroll and other taxes, all the candidates' plans would significantly boost federal revenues. Warren's plan would increase 2021 federal revenue by $296.0 billion, more than twice as much as Sanders's plan and more than four times as much as the other plans (table 10).[38] Federal tax revenue would increase $44.9 billion under Biden's plan, $63.4 billion under Klobuchar's plan, $71.0 billion under Buttigieg's plan, and $119.4 billion under Sanders's plan. Of the additional revenue raised by Warren's plan, 36 percent would come from Social Security payroll taxes, 57 percent would come from the new Social Security net investment surtax, and 5 percent would come from the Medicare net investment surtax generated by broadening the tax base to include distributions from S corporations and partnerships. Because of the behavioral reductions in labor and investment income, some of these gains would be offset by declines in federal income taxes. These reductions would be larger for Warren's plan than for the other plans, including Sanders's, because Warren's plan would impose a higher investment income tax rate than Sanders's plan and Warren's plan would tax more investment income.

TABLE 10

Change in Federal Revenue and Expenditures, 2021

By source and reform plan (billions of dollars)

	Biden	Buttigieg	Klobuchar	Sanders	Warren
Federal revenue					
Total	44.9	71.0	63.4	119.4	296.0
OASDI payroll tax	74.6	106.9	106.9	106.9	125.7
HI payroll tax	-2.7	-3.5	-3.5	-3.5	-3.8
Additional Medicare tax	-0.8	-1.1	-1.1	-1.1	-1.2
Medicare investment income surtax	0.0	0.0	0.0	-0.8	16.4
Medicare premiums	0.8	4.6	0.4	0.0	7.0
Social Security investment income surtax	0.0	0.0	0.0	62.4	197.2
Federal income tax	-27.0	-36.0	-39.4	-44.5	-45.3
Federal expenditures					
Total	45.1	127.6	11.8	4.0	320.8
Social Security benefits	45.7	128.9	12.0	4.2	324.3
Supplemental Security Income	-0.6	-1.4	-0.2	0.0	-3.7
Net federal revenue	-0.2	-56.6	51.6	115.4	-24.8

Source: DYNASIM4 ID980.

Note: The expenditures analysis considers only spending on Social Security, Supplemental Security Income benefits, and other cash benefits.

Although first-year tax revenue would surge under Warren's plan, it would be insufficient to cover the increased spending the plan would generate. Warren's plan would increase 2021 federal expenditures on Social Security by $324.3 billion, much more than the other plans would. Spending would soar immediately under her plan primarily because she would immediately increase monthly Social Security payments by $200 for all beneficiaries and provide a minimum Social Security benefit. Except for Buttigieg's plan, which would increase 2021 spending on Social Security by $128.9 billion, the other plans would increase 2021 spending by less than $100 billion. Klobuchar's plan would increase Social Security spending by $12.0 billion, Biden's plan would increase spending by $45.7 billion, and Sanders's plan would increase spending by $4.2 billion. The increased Social Security spending is offset slightly by reductions in SSI spending. Buttigieg's and Warren's plans would spend more in 2021 than they bring in, Biden's plan would increase spending by about as much as the new revenue it would generate, and the other plans would increase new federal revenue more than they increase spending. Sanders's plan would increase 2021 net federal revenue by $115.4 billion.

Over 10 years, additional spending would exceed additional revenue for Biden's and Buttigieg's plans, but additional revenue would exceed additional spending for Klobuchar's, Sanders's and Warren's plans (table 11).[39] Between 2021 and 2030, the projected increase in expenditures, relative to current law, would exceed the increase in revenue by $445 billion under Buttigieg's plan; the revenue increase would fall short of the spending increase every year from 2021 to 2030. Spending would immediately increase under Buttigieg's plan (unlike Biden's, Klobuchar's, and Sanders's plans) because it would provide a minimum Social Security payment to all beneficiaries, not just new beneficiaries.

Although Warren's plan would initially reduce net federal revenue, it would increase net federal revenue beginning in 2026; those surpluses would exceed the additional expenditure thereafter and increase net federal revenue by $159 billion over the 10-year period. Sanders's plan would generate the biggest net gain over the 10-year period ($1.526 trillion) because his plan would increase revenue without substantially increasing expenditures. Klobuchar's plan would also increase revenues substantially more than expenditures, but her plan would raise less revenue than Sanders's plan because it does not include a new investment income surtax. Appendix tables show the fiscal impact of each provision of the reform proposals.

TABLE 11

Change in Federal Revenue and Expenditures, 2021–30

By reform plan (billions of dollars)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2021–30
Biden											
Revenue	45	48	55	57	64	70	76	83	87	99	685
Expenditure	45	51	57	64	72	79	87	96	104	112	767
Net revenue	0	-3	-2	-7	-8	-9	-11	-13	-17	-13	-83
Buttigieg											
Revenue	71	77	88	92	102	109	119	128	135	156	1,078
Expenditure	127	136	139	143	148	153	158	165	173	182	1,523
Net revenue	-56	-58	-51	-50	-46	-44	-39	-36	-38	-26	-445
Klobuchar											
Revenue	63	69	79	83	91	97	106	115	121	140	966
Expenditure	12	12	13	13	15	15	16	17	18	20	150
Net revenue	52	57	66	69	77	82	90	98	103	121	816
Sanders											
Revenue	119	124	136	143	156	172	192	210	216	246	1,716
Expenditure	4	3	7	10	15	20	24	30	35	42	190
Net revenue	115	121	129	133	141	153	169	181	181	204	1,526
Warren											
Revenue	296	306	327	339	364	413	457	499	507	554	4,062
Expenditure	321	341	353	366	380	396	411	428	445	463	3,904
Net revenue	-25	-34	-26	-26	-16	17	46	71	62	91	159

Source: DYNASIM4 ID980.

Notes: Changes are calculated relative to current law. Revenues include the federal income tax (including the additional Medicare tax and the net investment income surtax), Social Security payroll tax, Medicare payroll tax, Medicare Part B and Part D income-related premiums, and the Social Security net investment income surtax. Expenditures include Social Security benefits, Supplemental Security Income benefits, Medicare Part B and Part D costs, and other government benefits. Other revenues and expenditures are excluded. Dollar amounts are not adjusted for inflation.

How Would the Plans Affect Economic Well-Being?

The Democratic candidates' plans would reshape the economic status of older and disabled adults. We project the likely impact on annual Social Security benefits, taxes paid and benefits received over a lifetime for beneficiaries who survive to age 65, the share of preretirement earnings that Social Security

benefits could replace, and the prevalence of economic hardship. We also project how median per capita income net of taxes for older and disabled adults would vary by demographic and economic characteristics.

Annual Social Security Benefits

Under current law, average annual Social Security benefits, minus any federal income taxes paid on those benefits, grow faster than inflation through 2035 (figure 5). Average payments increase as new beneficiaries begin collecting because those new benefits are based on more recent earnings and earnings generally increase faster than inflation. We project that payable benefits then fall 20 to 23 percent after 2035 when the Social Security trust funds are depleted, assuming that Congress does not act to improve Social Security's finances.

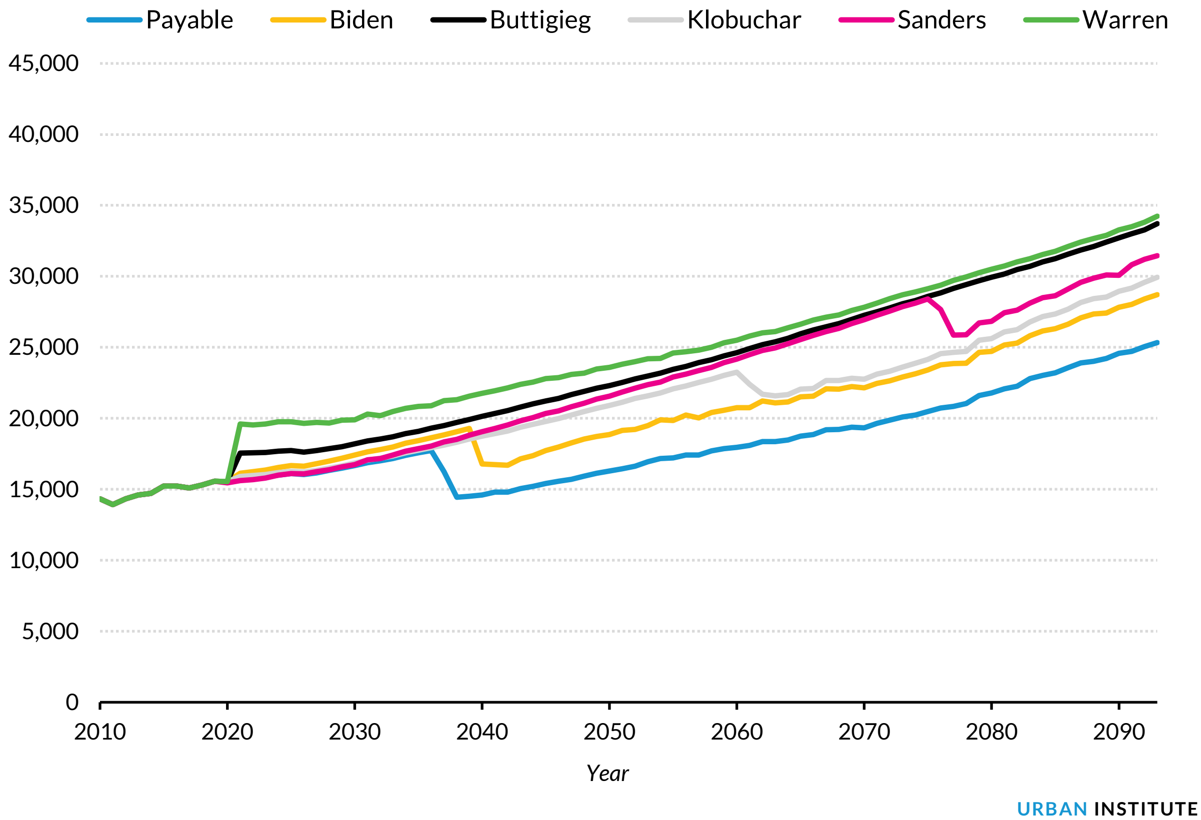
All five candidates' Social Security plans would raise benefits relative to the current-law-payable scenario, especially after 2035. Buttigieg's and Warren's plans would both immediately raise benefits because they would create a minimum benefit that applies to all beneficiaries, not just new beneficiaries. Additionally, Warren's plan would provide an immediate $2,400 annual bonus to all beneficiaries. Benefits would increase in 2021 under Biden's and Klobuchar's plans largely because they would raise survivor benefits. Biden's plan also would increase payments to long-term beneficiaries and government pensioners affected by the WEP and GPO, generating larger benefit increases than Klobuchar's plan. Sanders's plan, which limits the minimum benefit to new beneficiaries and slowly phases in the increase in the first bend point in the benefit formula, would increase benefits gradually relative to the current-law-payable scenario.

Warren's plan would increase net benefits most in all years. In 2065, average annual Social Security benefits would be 43 percent higher under Warren's plan than under the current-law-payable scenario ($26,700 versus $18,700, in 2018 inflation-adjusted dollars). Under payable scenarios, Biden's plan would increase average benefits least, but in all years his plan would generate higher average net benefits than does the current law. Because Biden's, Klobuchar's, and Sanders's plans are not solvent over a 75-year projection period, they would leave benefits only partially funded when Social Security's trust funds run out without Congressional action, though the underfunding would be smaller than under the current-law-payable scenario. Biden's plan would have a 15 percent benefit shortfall in 2041, Klobuchar's plan would have a 5 percent shortfall in 2061, and Sanders's plan would have an 11 percent shortfall in 2077. Even with this underfunding, average payable benefits in 2077 would be 24 percent higher under Sanders's plan than under the current-law-payable scenario, 18 percent higher under Klobuchar's plan, and 15 percent higher under Biden's plan.

FIGURE 5

Average Annual Social Security Income for Aged and Disabled Beneficiaries, 2010–93

For current law and each reform plan under payable scenarios (2018 inflation-adjusted dollars)



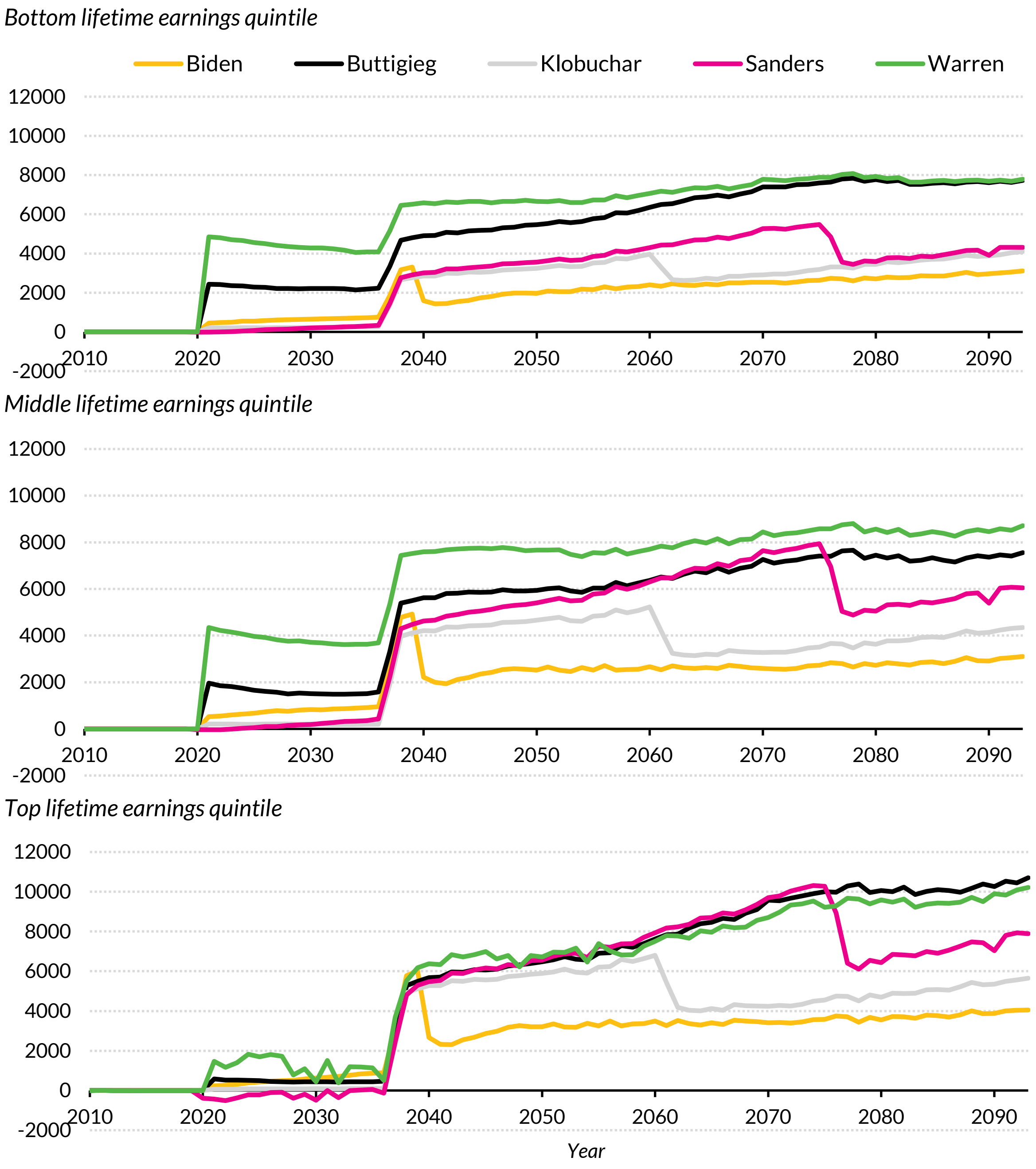
Source: DYNASIM4 ID980.

Notes: Figure shows average annual Social Security benefits, less federal income taxes paid on benefits and the Social Security net investment surtax, for all adult Social Security beneficiaries, expressed in 2018 inflation-adjusted dollars. The reform plans would go into effect in 2021.

The impact of the candidates' reform plans on Social Security benefits would vary across the lifetime earnings distribution (figure 6). For beneficiaries in the bottom fifth of the lifetime earnings distribution, average benefits under Buttigieg's plan and especially Warren's plan would increase sharply when implemented in 2021. Both plans would create a significant minimum benefit, and Warren's plan would provide an annual $2,400 bonus to all beneficiaries. Inflation would erode that bonus over time, however. The other plans would significantly raise benefits relative to the current-law- payable scenario in the mid-2030s, when the Social Security trust funds are projected to run out under current law.

FIGURE 6

Change in Average Annual Social Security Income for Aged and Disabled Beneficiaries under Payable Scenarios, 2010–93, by Lifetime Earnings Quintile and Reform Plan, Relative to Current Law (2018 Dollars)



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Source: DYNASIM4 ID980.

Notes: Figures show the change in average Social Security benefits, less federal income tax paid on benefits, relative to the current-law-payable scenario for all adult beneficiaries, expressed in inflation-adjusted 2018 dollars. For years during which beneficiaries are married, earnings are computed as average earnings received by each spouse.

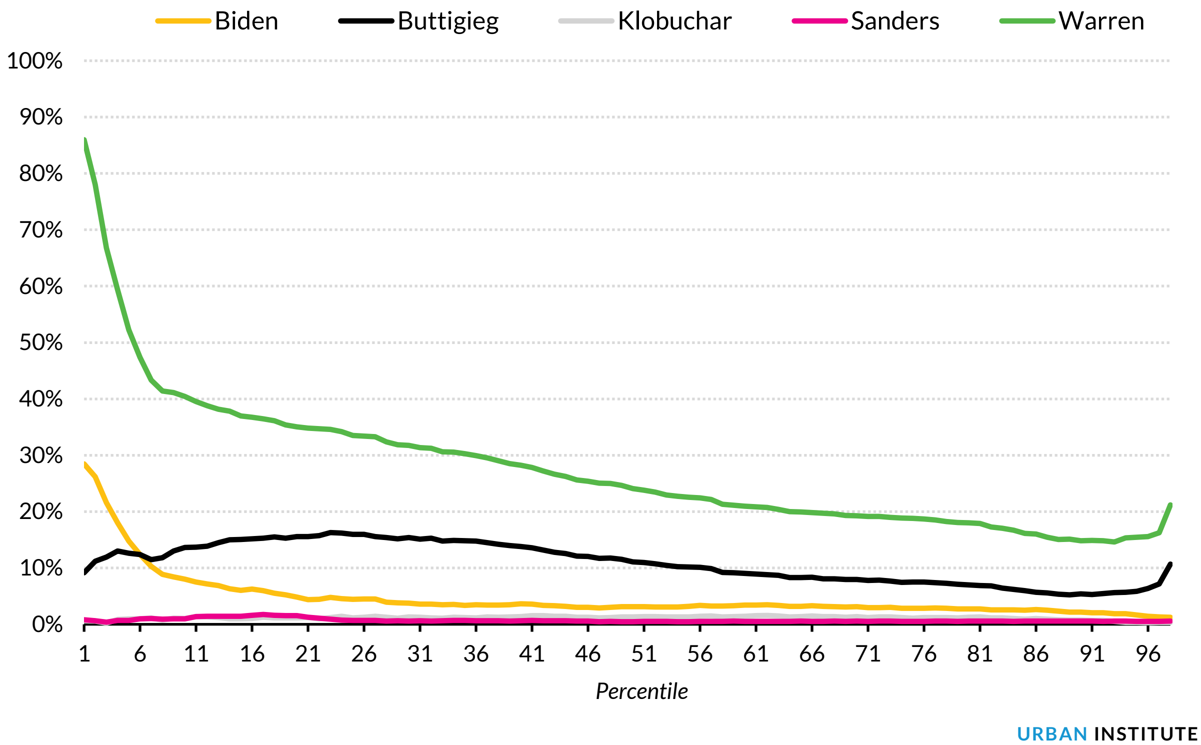
Before the trust funds are projected to run out, the reform plans proposed by the Democratic candidates would increase payments less for beneficiaries in the top fifth of the lifetime earnings distribution than for those in the bottom fifth. Initially, only Warren's plan would increase payments significantly to beneficiaries with high lifetime earnings, providing them with an annual $2,400 Social Security bonus. However, all the plans would pay beneficiaries with high lifetime earnings substantially more than they would receive under current law after the trust funds run out by avoiding the 20 to 23 percent across-the-board benefit cuts that would follow trust fund depletion without Congressional action. The Social Security trust funds would run out in later years under Biden's, Klobuchar's, and Sanders's plans, but those shortfalls would lead to smaller across-the-board cuts than those projected under current law without further Congressional action.

Initially, Warren's, Buttigieg's, and Biden's plans would provide much higher payments to beneficiaries with limited benefits relative to what they would receive under current law (figure 7). In 2025, beneficiaries at the 10th percentile of the benefit distribution would receive 41 percent more under Warren's plan, 13 percent more under Buttigieg's plan, and 8 percent more under Biden's plan. The minimum-benefit provision in Buttigieg's and Warren's plans, which apply to all beneficiaries, not only new ones, would significantly raise benefits at the low end of the distribution, and Warren's annual $2,400 Social Security bonus would have a relatively large percentage impact on beneficiaries receiving limited payments. Biden's and Warren's plans both repeal the WEP and GPO, which would generally increase payments to beneficiaries who would otherwise receive very limited payments. In 2025, the Biden plan would not increase benefits much for people in the top three-fourths of the benefit distribution. However, Buttigieg's plan would increase median benefits (the 50th percentile) 12 percent because the impact of the minimum benefit would extend well up the benefit distribution, and Warren's plan would increase benefits 25 percent, reflecting the combined impact of the minimum benefit and the Social Security bonus. Because of phase-ins and eligibility requirements in Klobuchar's and Sanders's plans, those plans would not increase Social Security benefits much in 2025.

FIGURE 7

Percent Change in Annual Social Security Benefit for Aged and Disabled Beneficiaries, 2025

By Social Security benefit percentile and reform plan relative to current law, under payable scenarios



Source: DYNASIM4 ID980.

Notes: Figure shows the percent change in Social Security benefits, less federal income tax on benefits, relative to benefits payable under current law, for all full-year adult beneficiaries in 2025.

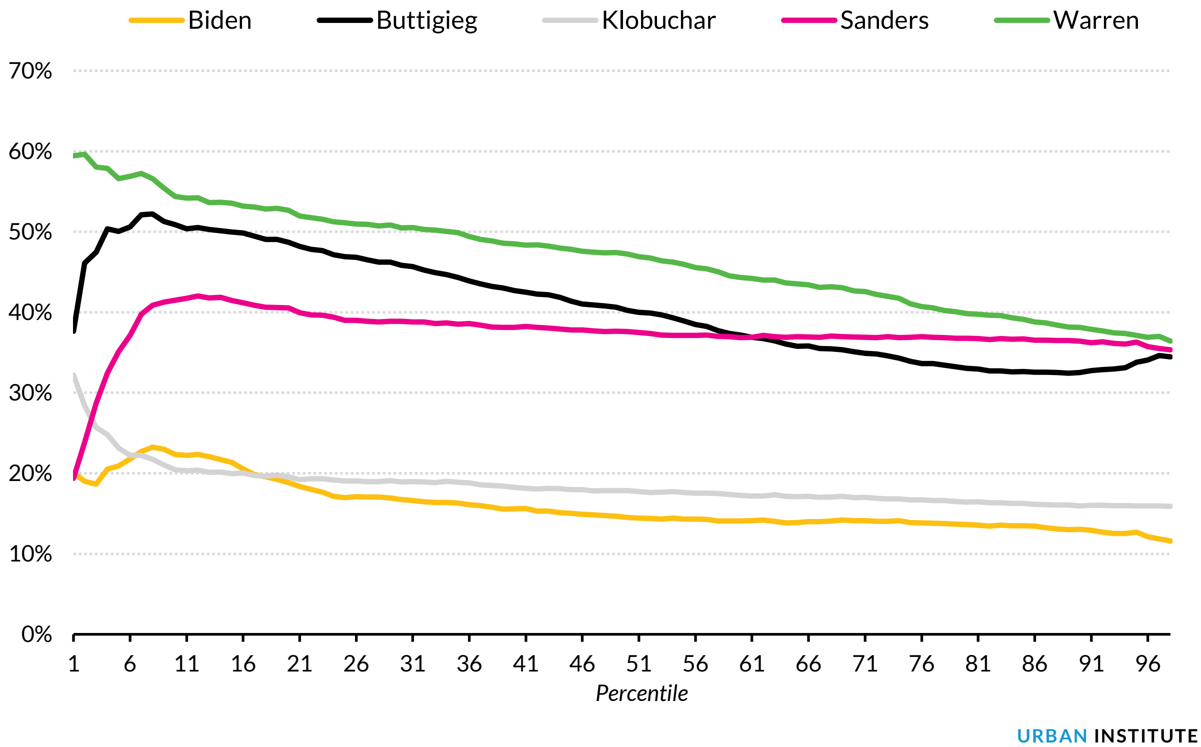
In 2065, when benefit enhancement phase-ins would be complete, all candidates' plans would increase Social Security benefits at all points in the benefit distribution compared with current-law-payable benefits (figure 8). Much of these gains would result from delaying and substantially reducing the required benefit reductions after the current-law trust funds are depleted.

All candidates' plans would generate larger *percentage* gains at the lower end of the benefit distribution than at the upper end. Of the five candidates' plans, Biden's and Klobuchar's would increase benefits least and Warren's would increase benefits most. The hump-shaped pattern in percentage gains near the bottom of the benefit distribution reflects the impact of the candidates' minimum-benefit provisions that increasingly boost payments to beneficiaries with 10 to 30 years of work and then diminish at higher benefit levels. Only Buttigieg's plan would allow workers to earn future Social Security benefits on their second-tier contributions (annual earnings above $250,000 in 2021), which increases benefits near the top of the benefit distribution. Klobuchar's plan has few benefit-enhancing provisions, but they are concentrated among those receiving the least benefits.

FIGURE 8

Percent Change in Annual Social Security Benefits for Aged and Disabled Beneficiaries, 2065

By benefit percentile and reform plan relative to current law, under payable scenarios



Source: DYNASIM4 ID980.

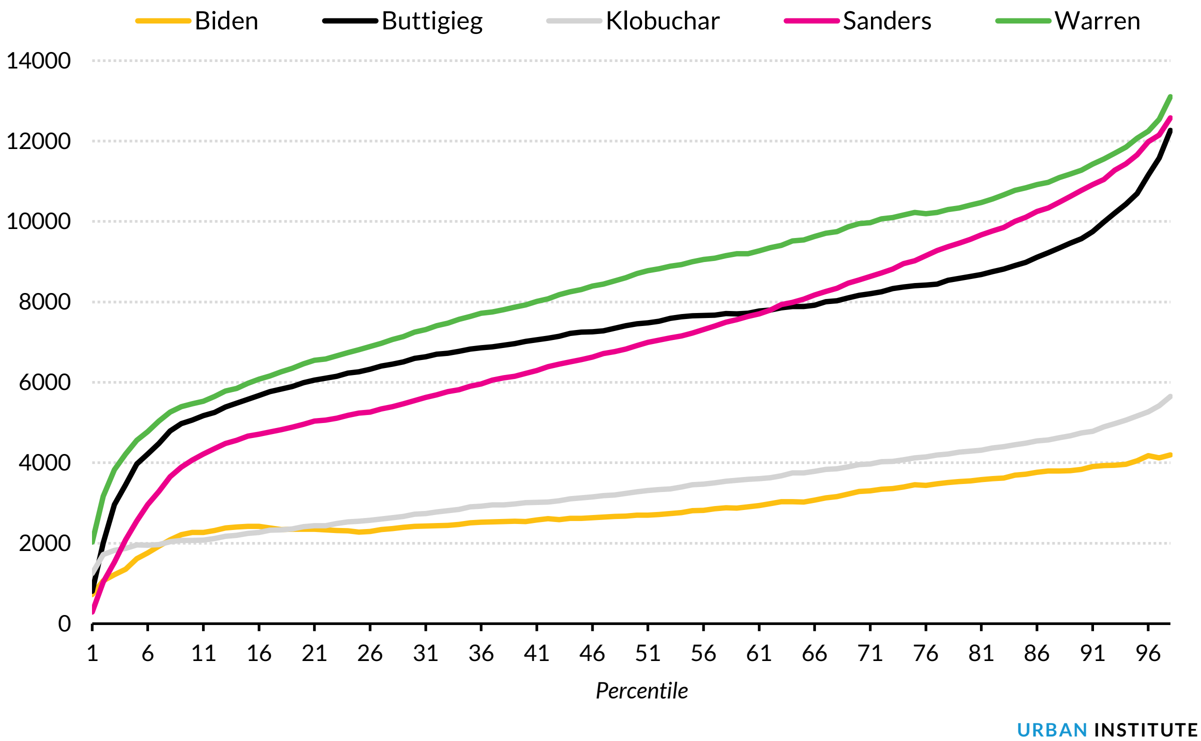
Notes: Figure shows the percent change in Social Security benefits minus federal income tax on benefits, relative to benefits payable under current law, for all full-year adult beneficiaries in 2065.

In dollar terms, benefit enhancements provided by the candidates' plans would increase with benefit levels, and the gains are largest for those receiving the highest benefits (figure 9). In 2065, Warren's plan would increase Social Security benefits by $10,250 (in 2018 inflation-adjusted dollars) at the 75th percentile of the benefit distribution compared with $6,800 at the 25th percentile. Much of these gains result from delaying and reducing the benefit reductions needed after the projected current-law trust funds are depleted under the assumption of no other Congressional action. Averting a 23 percent reduction in benefits generates a greater dollar gain for those with large benefits than those with small benefits. Although the progressive elements of the reform plans boost payments to low-benefit beneficiaries, those dollar gains are not large enough to offset the substantial gains made by high-benefit beneficiaries.

FIGURE 9

Change in Annual Social Security Benefits among Aged and Disabled Beneficiaries in 2065

By benefit percentile and reform plan relative to current law, under payable scenarios (2018 dollars)



Source: DYNASIM4 ID980.

Notes: Figure shows the dollar change in Social Security benefits minus federal income taxes paid on those benefits, relative to current-law-payable benefits for all full-year adult Social Security beneficiaries in 2065.

Lifetime Benefits and Taxes

Comparing lifetime benefits and taxes, as well as annual outcomes, is also informative. As longevity rises, lifetime benefits will increase unless annual benefits fall or the retirement age increases. However, the growth in lifetime benefits will be uneven because life expectancy has been increasing more rapidly for higher-socioeconomic-status groups than for lower-status groups (Bosley, Morris, and Glenn 2018; National Academies of Sciences, Engineering, and Medicine 2015; Waldron 2007).

Under the current-law-payable scenario, lifetime Social Security benefits relative to lifetime earnings are not projected to change much across generations for beneficiaries with moderate earnings who survive to age 65 (figure 10). For beneficiaries in the middle fifth of the lifetime earnings distribution, we project a median ratio of lifetime Social Security benefits to lifetime earnings of 9.5 percent for beneficiaries born between 1990 and 1999, compared with 9.6 percent for beneficiaries born between 1940 and 1949. Although we project that later beneficiaries will live longer and annual

benefits will generally increase, these gains will not keep pace with growth in lifetime earnings, primarily because the program would be forced to cut benefits if the trust funds run out and Congress takes no additional action. Lifetime benefits relative to lifetime earnings would decline somewhat over time for both the top fifth of lifetime earners, whose earnings are projected to increase substantially, and the bottom fifth, whose life expectancy is projected to increase only modestly. Because of Social Security's progressive benefit formula, however, beneficiaries with limited lifetime earnings who survive to age 65 will continue to receive more lifetime benefits as a share of their earnings than beneficiaries with higher lifetime earnings.

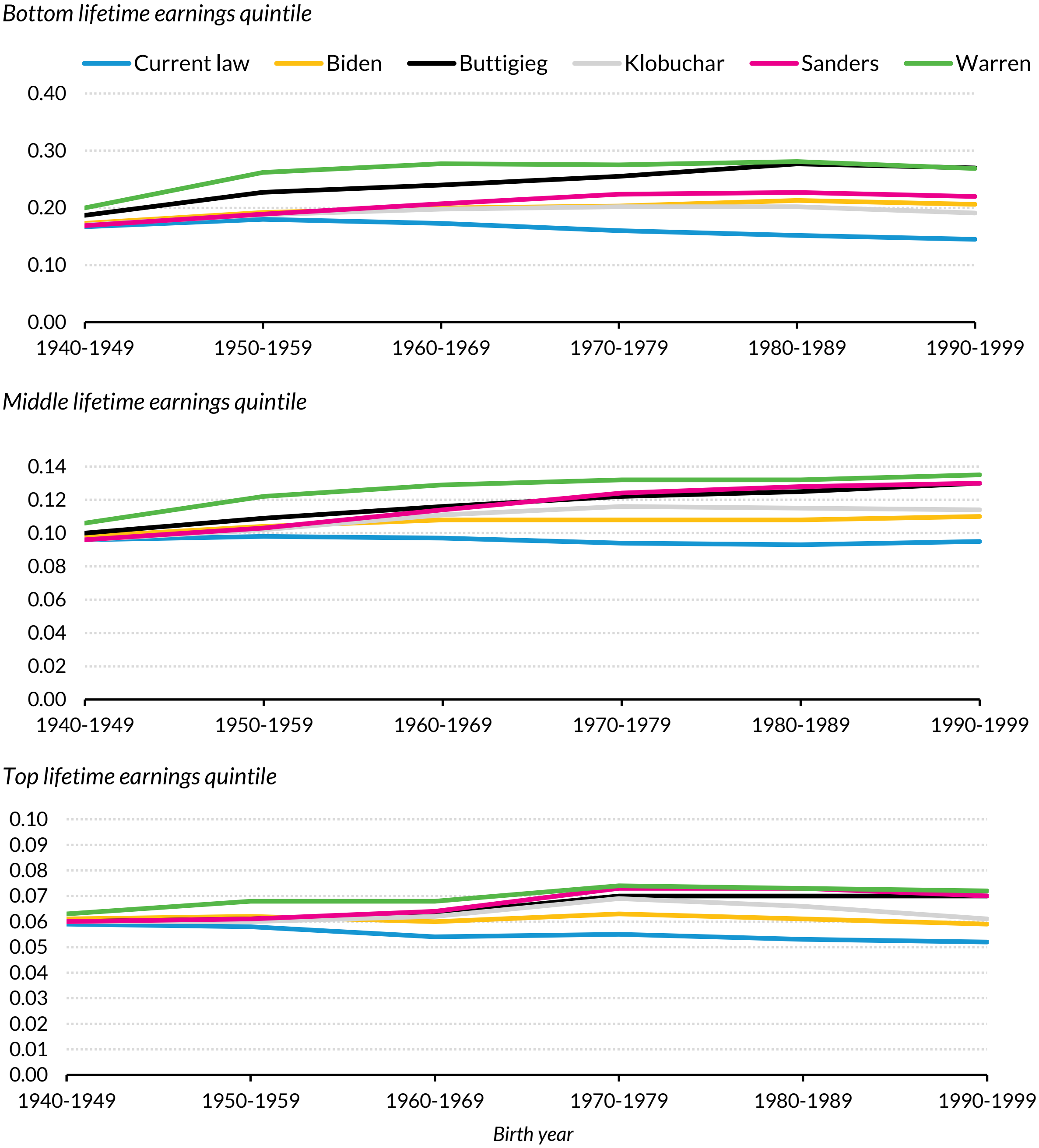
For both high and low earners, all the candidates' plans would increase workers' lifetime benefits as a share of their lifetime earnings compared with the current-law-payable scenario. Warren's plan increases lifetime benefits most. Her plan would immediately boost benefits, including for beneficiaries born between 1940 to 1949 (who are ages 72 to 81 in 2021), whereas the phase-in restrictions and eligibility limitations in the other candidates' plans would limit most gains to later cohorts.

For beneficiaries in the bottom fifth of the lifetime earnings distribution, Warren's and Buttigieg's plans would increase lifetime benefits relative to lifetime earnings most. The $200 monthly benefit bonus and expansive minimum benefit increases in Warren's plan would raise lifetime benefits for low-earners born between 1940 and 1949, and it would raise benefits even more for those born after 1949. Buttigieg's plan's more expansive caregiver credit, paired with its minimum benefit, would increase lifetime benefits for low earners born between 1990 and 1999 about as much as Warren's plan. Biden has a less expansive Social Security reform plan, but it would nonetheless increase benefits compared with the current-law-payable scenario. Although Biden's and Sanders's plans, unlike the other plans, increase their minimum benefit as the average wage increases, they would not increase low-earner lifetime benefits as much as Warren's and Buttigieg's plans.

All five candidates' plans would also raise lifetime benefits for moderate and high earners. Sanders's plan would substantially boost benefits for these groups because it would increase the first bend point in the benefit formula, raising payments to all beneficiaries. This provision would eventually increase lifetime benefits for high earners in Sanders's plan about as much as Warren's, whose $200 monthly benefit bonus would also apply to all beneficiaries regardless of income. Biden's plan would increase payments to all long-term beneficiaries, who tend to have more income than beneficiaries who die early, and Biden's, Sanders's, and Warren's plans would increase COLAs for all beneficiaries.

FIGURE 10

Median Ratio of the Present Value of Lifetime Social Security Benefits to the Present Value of Lifetime Earnings under Payable Scenarios, by Birth Year, Lifetime Earnings Quintile, and Reform Plan, for Adults Who Survive to Age 65



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Source: DYNASIM4 ID980.

Notes: Figures include all adults born between 1940 and 1999 who survive to age 65 in selected lifetime earnings quintiles. Restricting the sample to people who survive to age 65 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income on expected benefits. Couples divide benefits, taxes, and earnings evenly in years in which they are married. The present value is calculated at age 65 using a 2.6 percent real discount rate.

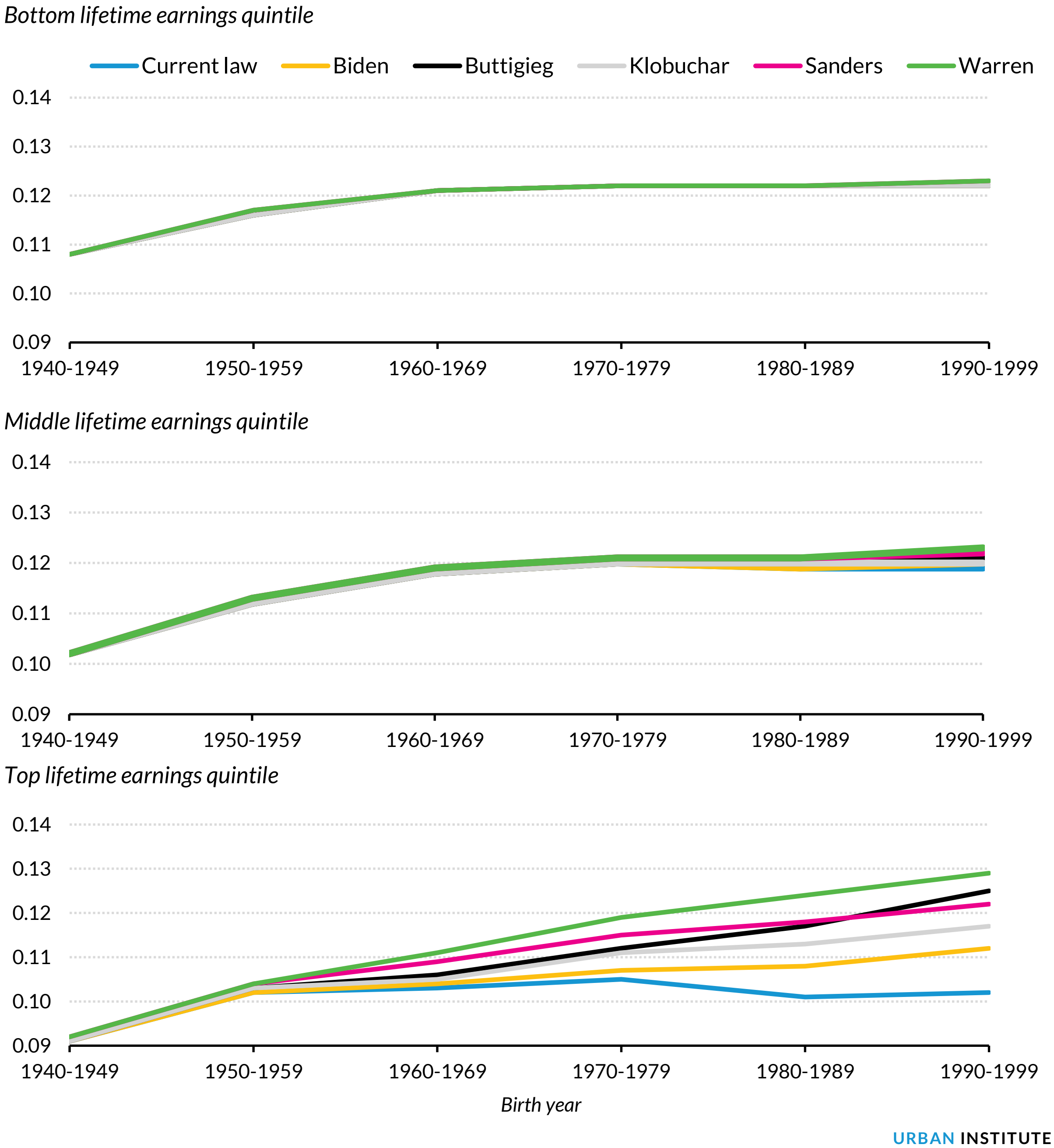
The lifetime burden of the tax increases included in the candidates' plans is not shared equally across birth cohorts (figure 11). Because payroll taxes are assessed on earnings, very few people born between 1940 and 1949, who are ages 72 to 81 and mostly retired in 2021, would pay the higher taxes included in the plans. Moreover, most of these adults spent many years working before 1983, when Social Security payroll taxes rates were much lower than their current 12.4 percent. Subsequent cohorts, who would spend more of their careers under the higher-tax regime, would face increasingly higher tax burdens. Tax burdens would also increase for later cohorts because the thresholds for the second-tier contribution base are not indexed for inflation.

Of the five candidates' plans, Warren's would increase lifetime taxes most because it features a higher payroll tax rate on earnings above $250,000 and taxes net investment income for high-income families. Buttigieg's and Klobuchar's plans incorporate the same payroll tax rates until 2039, when Buttigieg's plan would increase payroll taxes on high-earners to ensure Social Security solvency. Biden's plan would impose the smallest tax increase because its second-tier contribution base initially would cover only workers earning $400,000 or more each year. Although wage growth will eventually close the "donut hole," Biden's higher threshold allows more earners to remain in the tax-free zone for more years than the plans with the lower threshold.

Although the Social Security benefit formula is progressive, providing higher benefits as a share of earnings for low earners than for high earners, Social Security payroll taxes are not progressive. The taxable wage cap excludes high earnings from the payroll tax (and prevents workers from accruing benefits on those earnings). Under current law, workers in the top lifetime earnings quintile pay a lower average tax rate on their earnings than workers in the bottom quintile (figure 12).

FIGURE 11

Median Ratio of the Present Value of Payroll Taxes to the Present Value of Lifetime Earnings under Payable Scenarios, by Birth Year, Lifetime Earnings Quintile, and Reform Plan, for Adults Who Survive to Age 65



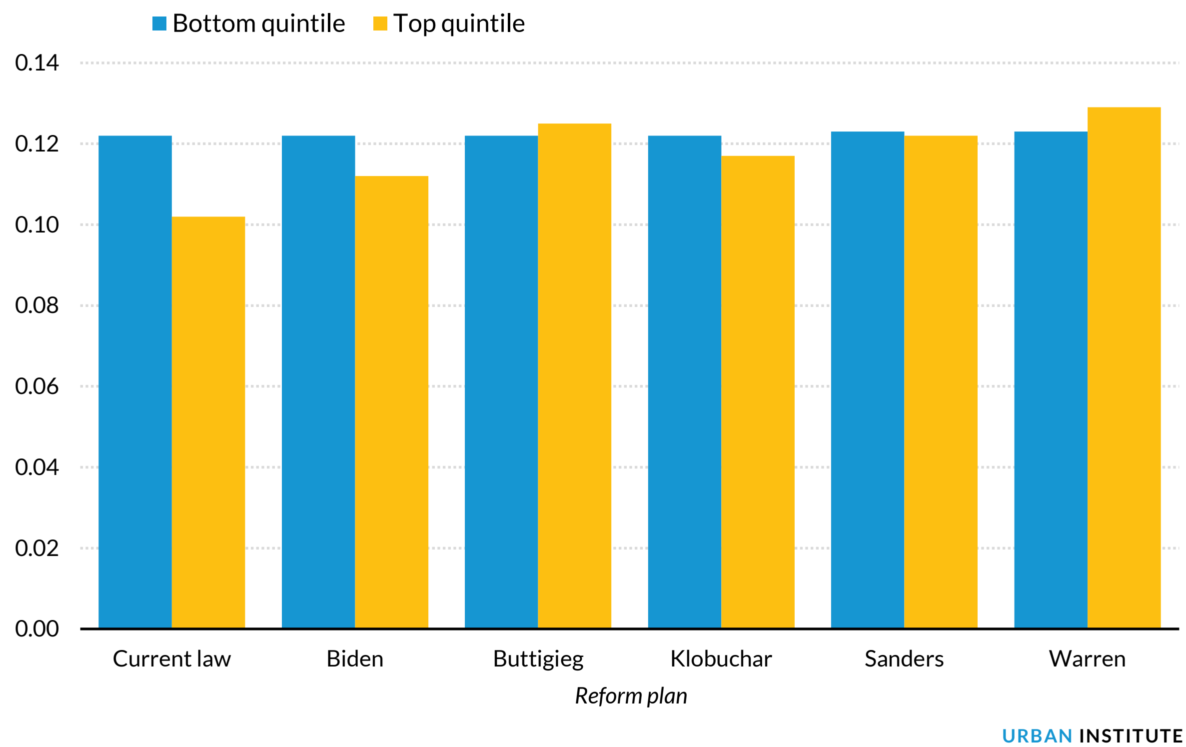
Source: DYNASIM4 ID980.

Notes: Figures include all adults born between 1940 and 1999 who survive to age 65. Restricting the sample to people who survive to age 65 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income. Couples split taxes and earnings in the years in which they are married. Taxes include both employer and worker Social Security payroll taxes and the Social Security net investment income tax. The present value is calculated at age 65 using a 2.6 percent real discount rate.

FIGURE 12

Median Ratio of the Present Value of Per Capita Payroll Taxes to the Present Value of Per Capita Earnings, Adults Born between 1990 and 1999

By selected lifetime earnings quintile and reform plan, adults who survive to age 65, under payable scenarios



Source: DYNASIM4 ID980.

Notes: Figure includes all adults born between 1990 and 1999 who survive to age 65 in the bottom and top quintiles of lifetime earnings. Restricting the sample to people who survive to age 65 helps illustrate the effects for typical retirees but understates the effects of differential mortality by income. Couples split taxes and earnings in years they are married. Taxes include both employer and worker Social Security payroll taxes and the Social Security net investment income tax. The present value is calculated at age 65 using a 2.6 percent real discount rate.

All five candidates' plans would raise taxes on high earners. Few people in the bottom three-fifths of the lifetime earnings distribution would ever pay higher taxes under the candidates' reforms than they would under current law. Sanders's and Warren's Social Security net investment income surtax would spread part of the tax burden to individuals born before 1950, taxing investment income for retirees with high incomes, whereas Buttigieg's high-earner tax would be restricted to later cohorts with more earnings years under the new tax regime. Warren's plan's higher payroll tax rate and added net investment income surtax would increase high earners' lifetime taxes most, and Biden's plan's higher tax threshold would increase lifetime taxes least. Under Biden's, Klobuchar's, and Sanders's plans, median lifetime payroll taxes relative to lifetime earnings for top quintile lifetime earners would remain

below levels for bottom-quintile lifetime earners, even for workers born from 1990 to 1999, who would work the longest under the plans' higher tax rates.

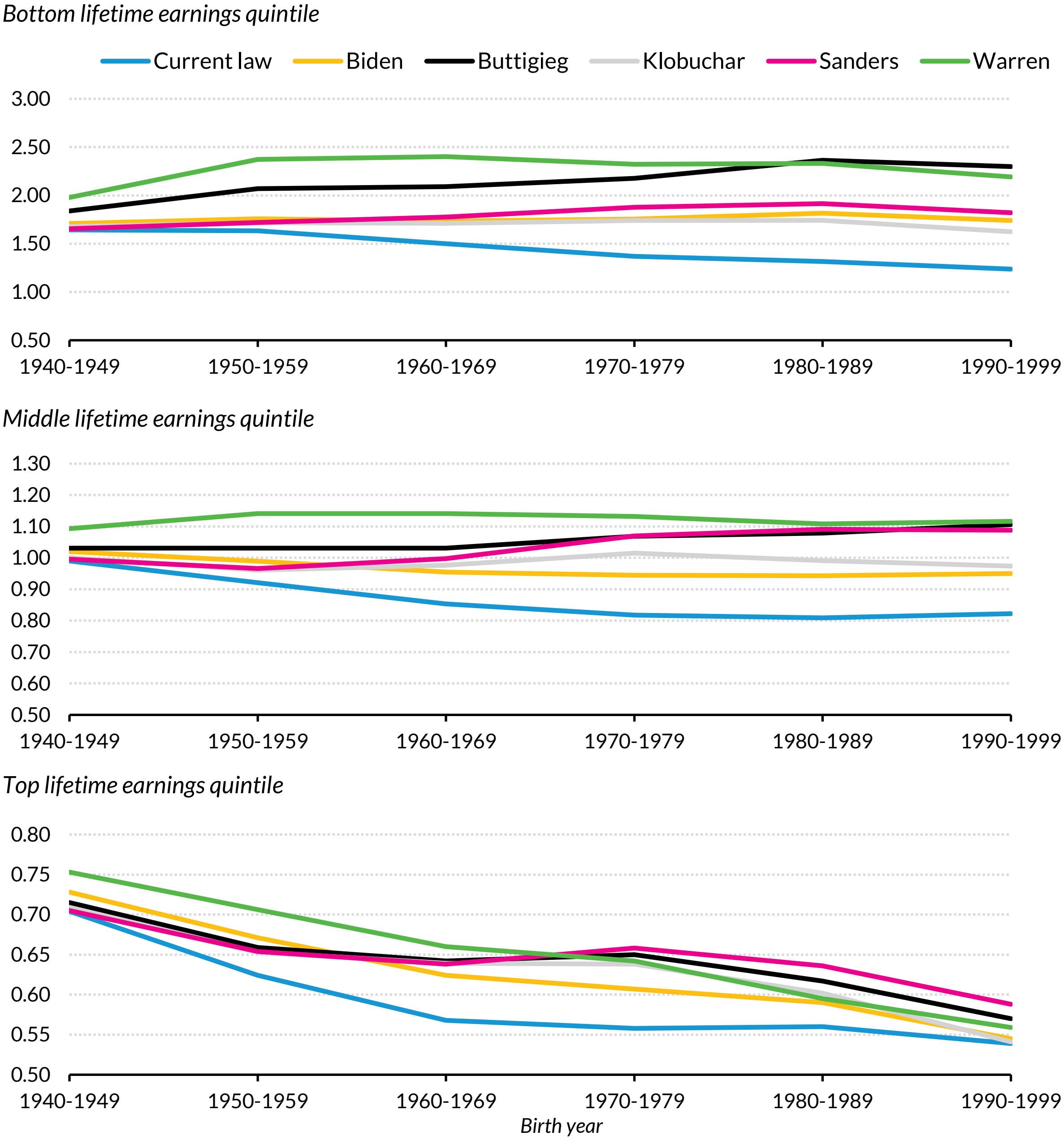
All five candidates would increase projected lifetime benefits relative to lifetime taxes for bottom-quintile earners compared with the current-law-payable scenario, and median workers in the bottom earnings quintile who survive to age 65 would receive more lifetime benefits than they paid in taxes (figure 13). Under payable scenarios, Warren's plan would increase the benefit-to-tax ratio most for individuals born between 1940 and 1979, but Buttigieg's plan would increase the ratio most for low earners born after 1979. For later cohorts, Buttigieg's more expansive caregiver credit boosts low earners' benefits more than Warren's caregiver credit. Even though Biden's and Klobuchar's plans have different provisions, both generate similar benefit-to-tax ratios for low lifetime earners.

Each of the candidates' payable plans would also increase projected lifetime benefits relative to lifetime taxes for top-quintile earners who survive to age 65 compared with the current-law-payable scenario. In all plans, median earners in the top fifth of the lifetime earnings distribution would pay more in lifetime taxes than they receive in lifetime benefits. Despite the higher tax burden on high lifetime earners, compared with the current law, even high earners would receive higher lifetime benefits under the candidates' plans.

Social Security provides financial protection in old age and in the event of disability or widowhood. As social insurance, the program will pay more benefits to people who experience particular outcomes, such as disability, widowhood, and survival to very old ages. The program also explicitly redistributes resources to certain groups (Burkhauser and Warlick 1981). Consequently, lifetime Social Security benefits will exceed lifetime contributions for some workers and fall short of contributions for others.

FIGURE 13

Median Ratio of the Present Value of Lifetime Social Security Benefits to the Present Value of Lifetime Payroll Taxes under Payable Scenarios, by Birth Year, Selected Earnings Quintile, and Reform Plan, Adults Who Survive to Age 65



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Source: DYNASIM4 ID980.

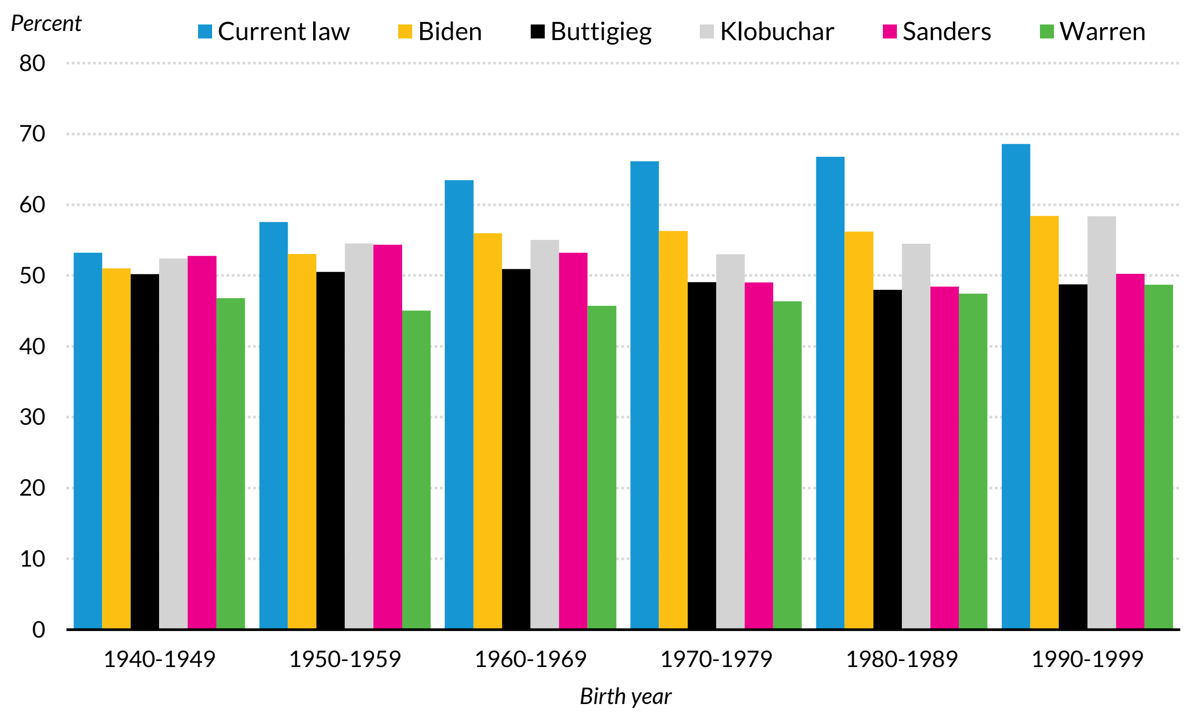
Notes: Figures include all adults born between 1940 and 1999 who survive to age 65 with lifetime earnings in selected quintiles. Restricting the sample to people who survive to age 65 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income on expected benefits. Couples split benefits, taxes, and earnings in years in which they are married. Taxes include both employer and worker Social Security payroll taxes and the Social Security net investment income tax. The present value is calculated at age 65 using a 2.6 percent real discount rate.

Focusing on the narrow issue of personal returns to contributions and ignoring the insurance protections that Social Security provides, we project that about one-half of adults born between 1940 and 1949 who survive to age 65 will receive lifetime benefits under the current-law-payable scenario that fall short of their lifetime contributions (figure 14).[40] Because the benefit cuts required under that scenario significantly reduce future benefits, we project that this share will increase for successive birth cohorts and approach 70 percent for those born in the 1990s. All candidates' plans would reduce the projected share of age-65 survivors who receive lifetime benefits that fall short of their contributions. By focusing on people who survive to age 65, however, we exclude those who die before qualifying for Social Security retirement benefits. According to Social Security projections, roughly 20 percent of men and 12 percent of women born in 1960 will die between ages 18 and 64, and survivors tend to have higher incomes and education than the early decedents (Favreault 2019).

FIGURE 14

Percentage of Adults Surviving to Age 65 Who Pay More in Social Security Payroll Taxes Than They Receive in Lifetime Benefits

By birth year and reform plan, under payable scenarios



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Source: DYNASIM4 ID980.

Notes: Figure includes all adults born between 1940 and 1999 who survive to age 65. Restricting the sample to people who survive to age 65 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income. Couples split benefits and taxes in years in which they are married. Taxes include both employer and worker Social Security payroll taxes and the Social Security net investment income tax. The present value is calculated at age 65 using a 2.6 percent real discount rate.

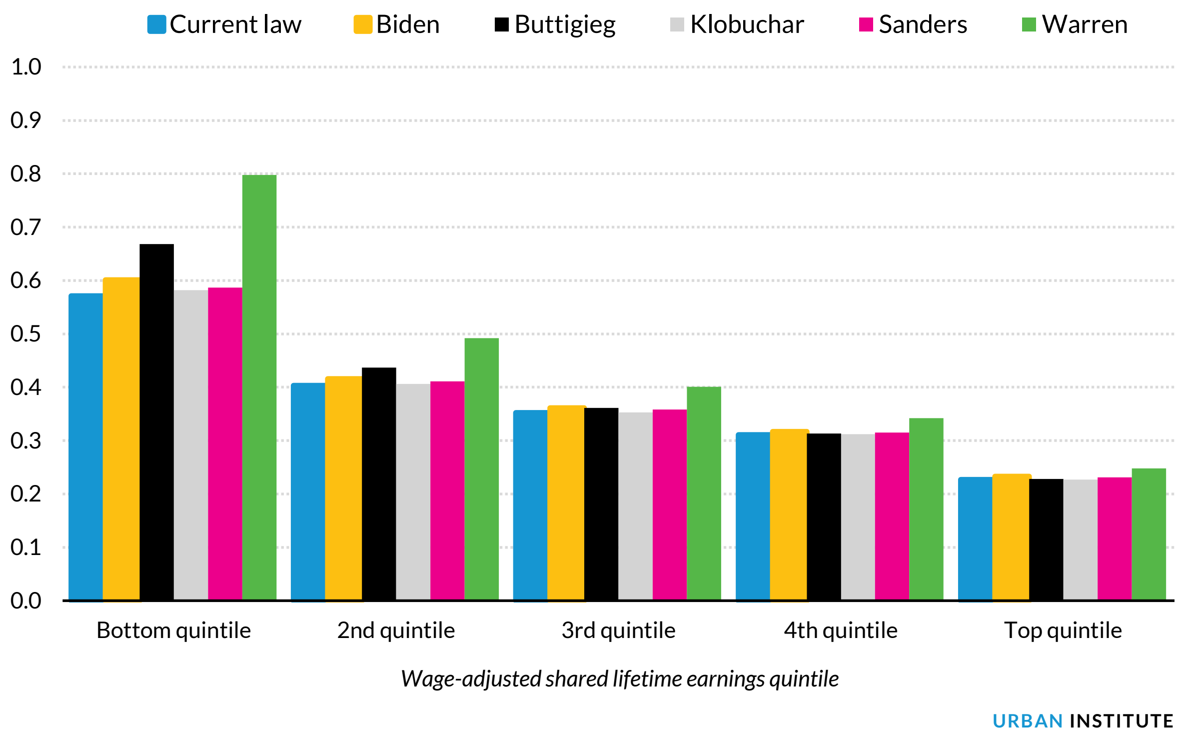
Replacement Rates

An important indicator of retirement security is a person's capacity to replace his or her preretirement earnings in old age.[41] For adults born between 1956 and 1965 who survive to age 70, we project that the median ratio of per capita Social Security benefits to per capita average wage-indexed lifetime earnings is 0.35 under the current-law-payable scenario for workers in the middle of the lifetime earnings distribution (figure 15). Because the benefit formula is progressive, the ratio rises to 0.57 for workers in the bottom fifth of the earnings distribution and falls to 0.23 for workers in the top fifth of the distribution.

FIGURE 15

Median Ratio of Annual Per Capita Social Security Benefits to Average Lifetime Earnings, Age 70

By lifetime earnings quintile and reform plan under payable scenarios, adults born between 1956 and 1965



Source: DYNASIM4 ID980.

Notes: Figure includes all individuals born between 1956 and 1965 who survive to age 70. Couples split benefits and earnings in years in with they are married. The lifetime earnings measure is the annual average of the top 35 years of wage-indexed shared earnings. Restricting the sample to people who survive to age 70 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income.

Warren's Social Security plan would lead to an increase in the age-70 benefit replacement rate across the income distribution for adults born between 1956 and 1965, but the impact would be strongest for those with limited lifetime earnings. Under her plan, the projected median ratio would

increase to 0.80 in the bottom quintile of the earnings distribution and 0.49 in the second quintile. All beneficiaries born from 1956 to 1965 would gain from Warren's $200 monthly benefit increase, but that bonus would represent a larger share of earnings for low lifetime earners than for high lifetime earners. Many beneficiaries with limited lifetime earnings would also gain from Warren's minimum benefit, which covers existing beneficiaries. Buttigieg's plan, which does not include an across-the-board benefit increase but includes a minimum benefit that covers existing beneficiaries, would generate a smaller increase in the benefit replacement rate for 70-year-olds in the bottom lifetime earnings quintile. Because the minimum benefit included in Biden's and Sanders's plans would exclude existing beneficiaries, their plans would barely increase the benefit replacement rate for 70-year-olds born between 1956 and 1965.

Our projections show that the share of earnings replaced by Social Security at age 70 will fall over time. Under the current-law-payable scenario, the median Social Security replacement rate for adults born between 2006 and 2015 in the middle of the lifetime earnings distribution will reach a ratio of only 0.29, 6 points less than for individuals born between 1956 and 1965 (figure 16). The projected replacement rate is lower for later cohorts because the current-law-payable scenario assumes that Social Security benefits will be cut across the board after 2035 when the Social Security trust funds run out. Moreover, beneficiaries born after 1959 face a higher Social Security retirement age, and hence larger actuarial benefit reductions, than those born earlier.

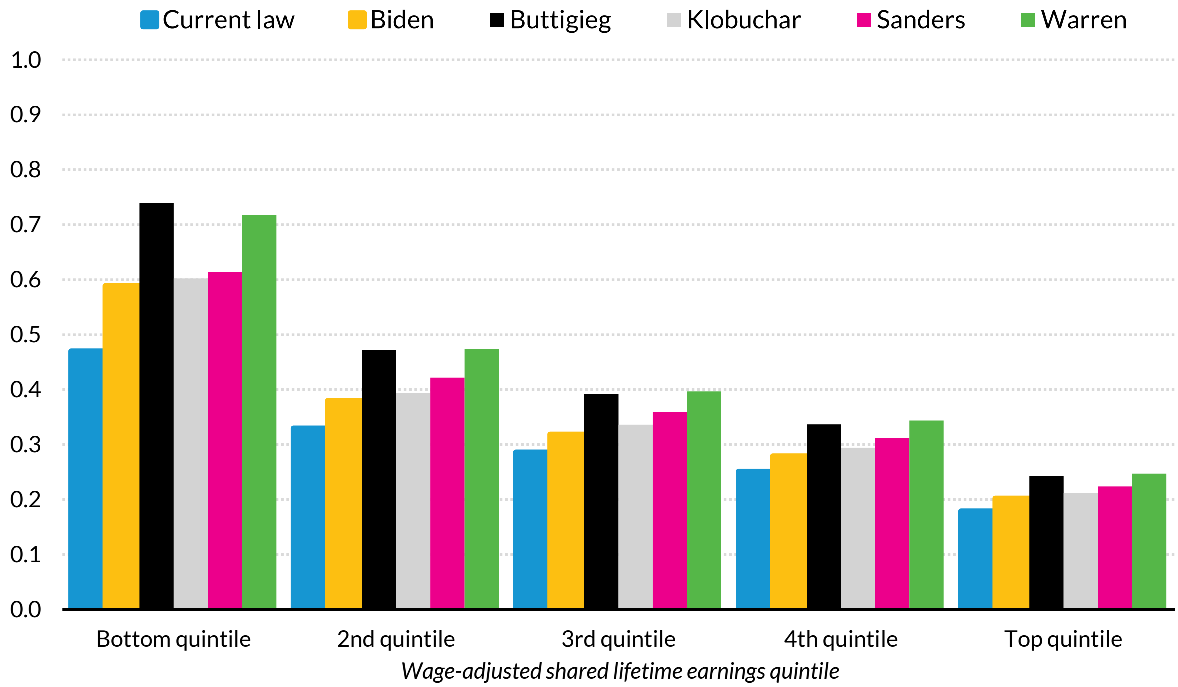
A usual goal for retirement planning is to maintain one's preretirement living standards, and replacing 75 percent or more of preretirement earnings is a common rule of thumb for adequate retirement income (Cosic, Johnson, and Smith 2018). The target is less than 100 percent because retirees do not pay payroll taxes or save for retirement, and their children have usually left home. We next compare total income (not just Social Security benefits) to average annual earnings received between ages 50 and 59.

We project that the share of 70-year-olds unable to replace 75 percent of their preretirement income will increase over time, partly because of the scheduled increase in Social Security's full retirement age and benefit reductions expected after 2035 when the Social Security trust funds are depleted, assuming no further Congressional action (figure 17). Current-law-payable benefits will be 20 to 23 percent lower for all beneficiaries after 2035 when the trust funds are depleted, affecting everyone in our sample of 70-year-olds born after 1965. Those cuts will also affect beneficiaries born before 1965, but not until after they reach age 70.

FIGURE 16

Median Ratio of Annual Per Capita Social Security Benefits to Average Lifetime Earnings, Age 70

By shared earnings quintile and reform plan under payable scenarios, adults born between 2006 and 2015



Source: DYNASIM4 ID980.

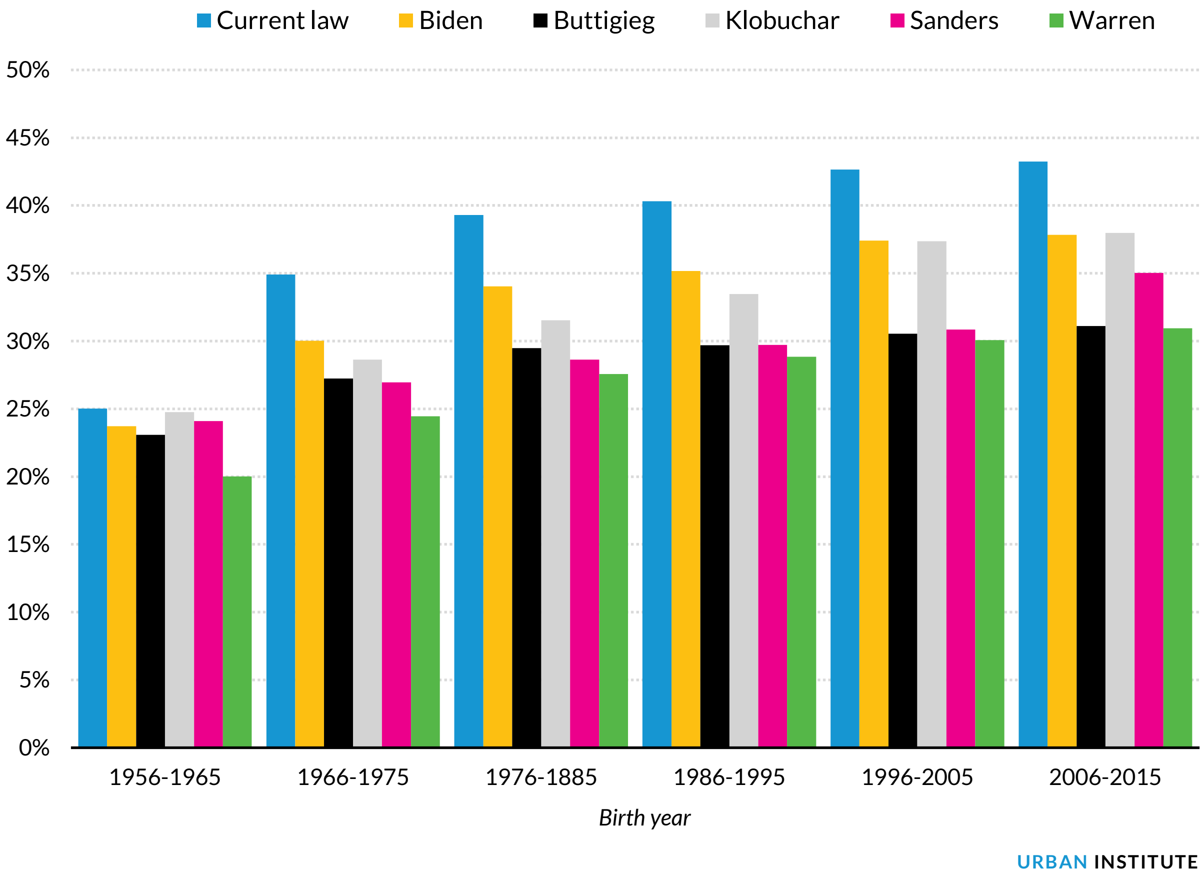
Notes: Figure includes all adults born between 2006 to 2015 who survive to age 70. Couples split benefits and earnings in years they are married. The lifetime earnings measure is the annual average of the top 35 years of wage-indexed shared earnings. Restricting the sample to people who survive to age 70 helps to illustrate the effects for typical retirees, but understates the effects of differential mortality by income.

All candidates' plans would reduce the share of 70-year-olds unable to replace 75 percent of their preretirement income. Under payable scenarios, Biden's and Klobuchar's plans do less to shore up retirement incomes and leave more seniors falling short than Buttigieg's, Sanders's, and Warren's plans. Warren's plan helps more 70-year-olds than the other candidates' plans, though the projected share of 70-year-olds with retirement income below 75 percent of preretirement earnings rises over time for all modeled plans. Policy changes that increase benefits for low-income beneficiaries help reduce the share of seniors who fall short of the 75 percent replacement rate target. Buttigieg's, Sanders's, and Warren's plans, which most improve Social Security's long-term financing, also best support low-income beneficiaries, who are disproportionately harmed by the across-the-board benefit reductions that would occur if no Social Security reforms are adopted and the trust funds run out.

FIGURE 17

Percentage of Adults Unable to Replace 75 Percent of Their Preretirement Earnings at Age 70

By birth year and reform option, under payable scenarios



Source: DYNASIM4 ID980.

Notes: Figure includes all individuals born from 1956 to 2015 who survive to age 70. Couples split incomes and benefits in years they are married. The analysis compares age-70 per capita family income to average annual earnings received from ages 50 to 59, both measured in inflation-adjusted 2018 dollars. The age-70 income measure includes Social Security, earnings, partnership and S-corporation income, defined-benefit pensions, Supplemental Security Income, other cash benefits, and the annual income from an annuity valued at 80 percent of financial assets (including retirement accounts). Restricting the sample to people who survive to age 70 helps illustrate the effects for typical retirees but understates the effects of differential mortality by income.

Economic Hardship

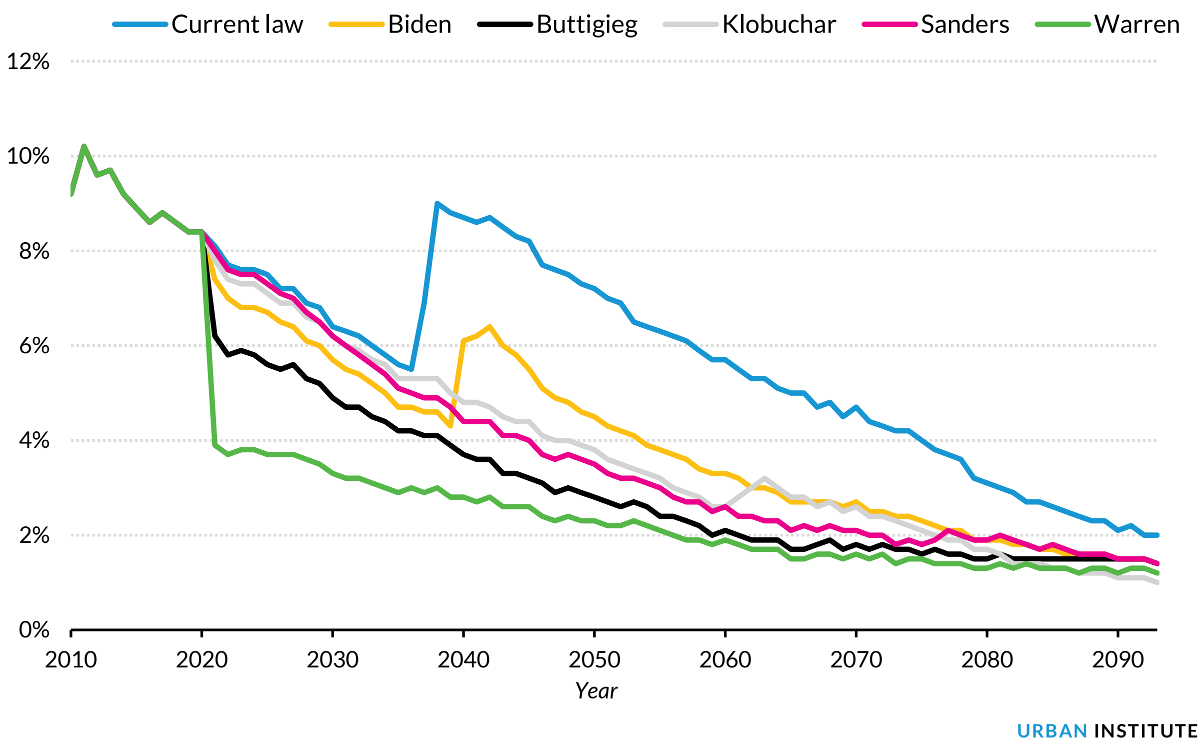
Economic growth, which raises lifetime earnings and future Social Security benefits, will reduce poverty rates for older adults and people with disabilities (figure 18). We project that between 2011 and 2035, the current-law poverty rate for Social Security beneficiaries will fall from 10.2 percent to 5.5 percent. However, our projections show that poverty rates will spike to 9.0 percent in 2037 under current law if Congress allows the Social Security trust funds to run out and the program is forced to cut benefits. The

poverty rate would then continue to fall as economic growth continues to raise future Social Security benefits.

FIGURE 18

Annual Poverty Rate among Aged and Disabled Beneficiaries, 2010–93 (%)

Under current law and each reform plan, for payable scenarios



Source: DYNASIM4 ID980.

Notes: Figure shows the share of all adult Social Security beneficiaries with incomes below the federal poverty level.

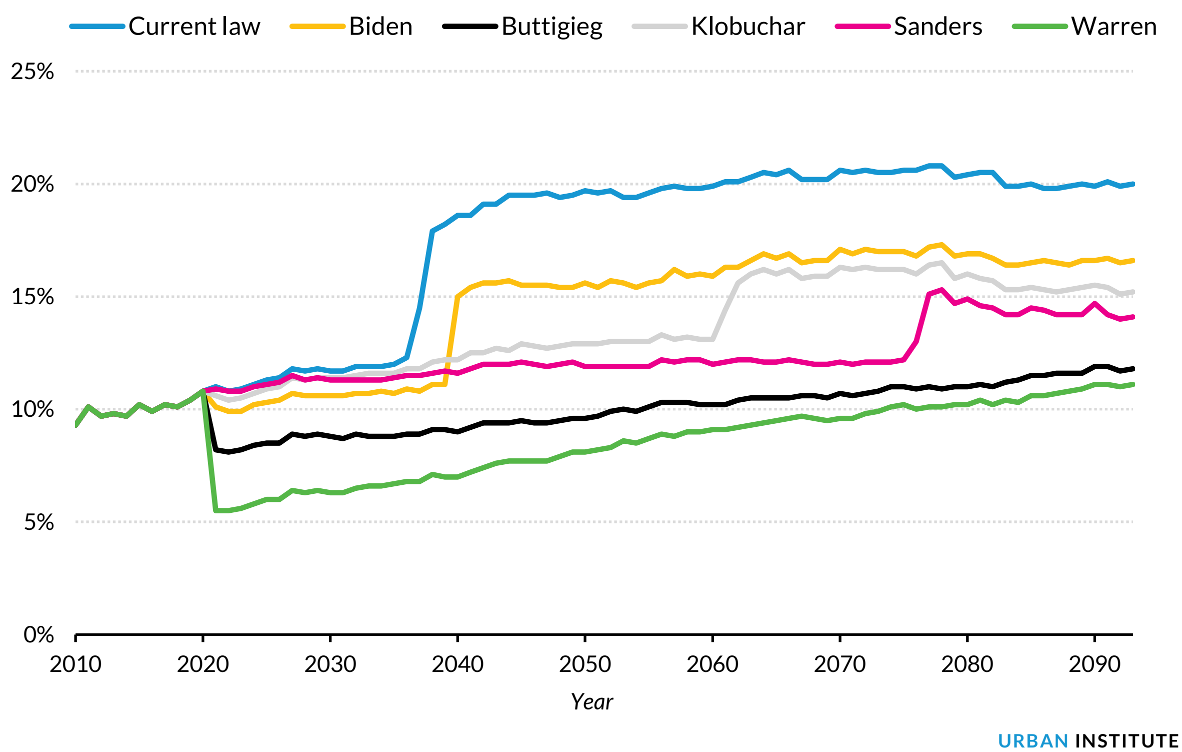
Upon implementation, Biden's, Warren's, and Buttigieg's plans would immediately reduce the poverty rate for Social Security beneficiaries. Warren's and Buttigieg's plans would provide a minimum benefit that would prevent beneficiaries with long-term work histories from falling into poverty. Warren's plan provides an annual $2,400 Social Security bonus. In 2021, the poverty rate for Social Security beneficiaries would fall about 4 percentage points under Warren's plan, 2 percentage points under Buttigieg's plan, and 1 percentage points under Biden's plan, and it would continue to decline in subsequent years. The other reform plans would reduce poverty rates more gradually, although they would all lead to substantially lower poverty rates than the current-law-payable scenario after the Social Security trust funds run out.

Another way to assess the financial security of Social Security beneficiaries is to compare their income to earnings received by workers and define inadequate income as family income that falls short of 25 percent of average economy-wide earnings. Using this definition, we project that the share of adult Social Security beneficiaries with inadequate income would gradually increase over time, rather than declining like the poverty rate, and would spike in 2037 if Congress were to allow the Social Security trust funds to run out (figure 19). Buttigieg's and Warren's plans would reduce the share of Social Security beneficiaries with inadequate incomes in 2021, and the share would then slowly increase. The minimum-benefit provisions in their plans are indexed to inflation, which generally grows

FIGURE 19

Percentage of Beneficiaries with Incomes below 25 Percent of Average Earnings, 2010–93

Under current law and each reform plan, for payable scenarios



Source: DYNASIM4 ID980.

Notes: Estimates include all adult Social Security beneficiaries.

more slowly than average wages. Under Biden's and Sanders's plans, which include minimum-benefit provisions that are indexed to wage growth, the share with inadequate incomes would not change much. Nonetheless, the benefit enhancements in Buttigieg's and Warren's plans would lead to a lower prevalence of inadequate income than would current law or the other Democratic candidates' plans. The share of beneficiaries with low incomes would spike under Biden's, Klobuchar's, and Sanders's plans

when those plans require solvency-related benefit reductions, but those shares would remain well below the share that would prevail under the current-law-payable scenario.

Income of Aged and Disabled Adults

Under the current-law-payable scenario, the projected median per capita net income of older adults and people with disabilities in 2065 is $36,500 (table 12). Median incomes are lower for Black people, Hispanic people, women, people age 85 or older, divorced or never-married adults, and people who receive disability benefits, especially at younger ages. Outcomes also vary sharply by educational attainment. Median income for college graduates is more than four times as high as the median for adults who did not complete high school and more than twice as high as the median for high school graduates who never attended college.

Our projections indicate that median per capita net income would increase under all the candidates' plans. Median net income in 2065 would be 9 percent higher under Biden's and Klobuchar's plans, 20 percent higher under Sanders's plan, 21 percent higher under Buttigieg's plan, and 25 percent higher under Warren's plan. Each plan would increase median incomes across all demographic groups, but certain groups would gain more than others. Although specific impacts vary by plan, the largest percentage gains would generally go to beneficiaries with the lowest incomes and lowest lifetime earnings, including Disability Insurance beneficiaries; Black people and Hispanic people; less-educated adults; women; the oldest adults; and widowed, divorced, and never-married beneficiaries. Warren's plan generally would increase projected median income for the lowest-income subgroups more than the other candidates' plans, including a 63 percent increase for those in the bottom income quintile, a 61 percent increase for those in the bottom lifetime-earnings quintile, a 32 percent increase for individuals with fewer than 10 years of work, and a 65 percent increase among individuals without a high school diploma. These subgroups would benefit from Warren's $200 monthly benefit increase, minimum-benefit provisions, and caregiver credits. Buttigieg's plan would also increase net incomes for the lowest-income subgroups, but gains for each subgroup would generally be somewhat smaller than under Warren's plan. However, Buttigieg's plan's more generous caregiver credit increases net incomes more for people with fewer work years than Warren's plan.

TABLE 12

Median Per Capita Net Income under Current Law and Projected Percentage Increase under Each Reform Plan, 2065

By personal characteristics for aged and disabled adults, under payable scenarios

	Current law	Percentage Increase under Each Plan				
	(2018 dollars)	Biden	Buttigieg	Klobuchar	Sanders	Warren
All	**36,500**	**9**	**21**	**9**	**20**	**25**
DI take-up age						
Never receive DI	38,700	8	19	8	19	23
35 or younger	23,500	14	33	17	34	40
36–45	24,900	13	33	15	33	38
46–55	28,200	12	34	15	30	38
56–67	30,200	11	29	13	28	31
Age						
0–61	28,400	11	30	14	28	34
62–69	39,700	5	14	6	13	14
70–74	38,300	8	20	9	20	22
75–79	36,300	9	21	10	22	25
80–84	35,600	12	23	11	24	29
85 and older	33,300	14	33	12	27	44
Sex						
Female	35,600	10	24	10	21	28
Male	37,400	8	19	8	19	21
Education						
No high school diploma	13,000	25	70	22	37	65
High school graduate	25,600	13	32	13	27	36
Some college	35,100	9	21	10	21	26
College graduate	54,100	5	12	6	13	15
Race and Hispanic origin						
White non-Hispanic	42,600	7	17	8	18	21
Black non-Hispanic	31,000	11	25	10	23	29
Hispanic	25,300	12	32	12	26	36
Other	40,400	8	19	8	19	22
Marital status						
Married	42,400	6	15	6	15	16
Widowed	37,800	13	27	12	25	36
Divorced	32,700	11	26	11	24	30
Never married	24,200	12	31	13	31	34
Own work years						
0–9	9,400	18	38	16	20	32
10–14	16,500	15	45	18	30	45
15–19	16,300	18	50	18	34	48
20–24	17,200	19	52	18	34	54
25–29	20,800	15	46	14	31	48
30–34	25,200	13	35	13	28	37
35–39	30,400	10	28	11	23	30
40 or more	47,700	6	14	7	15	17
Lifetime earnings quintile						
Bottom	13,700	24	61	19	39	61
Second	23,500	13	36	13	29	40
Third	35,400	9	20	9	21	25
Fourth	50,300	6	13	6	14	15
Top	77,000	3	8	3	8	8
Income quintile						
Bottom	10,900	28	62	20	44	63

	Current law (2018 dollars)	Percentage Increase under Each Plan				
		Biden	Buttigieg	Klobuchar	Sanders	Warren
Second	22,700	14	36	14	31	40
Third	36,600	9	21	9	20	25
Fourth	57,000	5	12	5	12	13
Top	104,000	2	5	2	4	3

Source: DYNASIM4 ID980.

Notes: DI=Disability Insurance. Table includes all adults age 62 and older and younger adults receiving Social Security benefits. Net income is calculated on a per capita basis and includes earnings, partnership and S-corporation income, Social Security benefits, Supplemental Security Income, defined-benefit pension income, other cash benefits, interest, dividends, rental and royalty income, capital gains, and taxable retirement account withdrawals, all minus federal and state income tax, worker Social Security and Medicare payroll taxes (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premium. Incomes are reported in 2018 inflation-adjusted dollars.

Biden's and Klobuchar's payable plans, which can afford to pay the least generous benefits of the candidates' plans because of financing constraints, would still help the most vulnerable aged and disabled adults. Biden's plan's minimum benefit, caregiver credit, benefit increases for some widows and widowers, and 20-year beneficiary increase target the lowest-income subgroups. However, Biden's tax increase would not be sufficient to avert solvency-related benefit cuts once the trust funds run out if Congress takes no further action. Nonetheless, his targeted benefit increases would help the most vulnerable subgroups. Klobuchar's plan includes fewer benefit enhancements than Biden's plan, but it generates comparable income gains in 2065 because funding constraints would require both plans to reduce benefits that year to match available tax revenues. However, Biden's plan would better target benefits to the lowest lifetime earners and lowest-income beneficiaries than would Klobuchar's plan, thus raising incomes for those beneficiaries somewhat more.

The candidates' plans would also help higher-income beneficiaries. The PIA and COLA increases in Sanders's plan, for example, would be available to all beneficiaries regardless of income. His plan would increase net incomes for more-advantaged subgroups more than Biden's or Klobuchar's plans, raising projected median incomes for college graduates 13 percent and for adults with 40 or more work years 15 percent. Despite increases in payroll taxes and the newly added OASDI net investment income surtax, median net incomes for top earners and high-income families would be higher under all the candidates' plans than under the current-law-payable scenario.

Provisions designed to help women and widowed beneficiaries would raise income for those groups. All five candidates' plans would increase median income more for women than for men, both in absolute dollars and percentage terms. Although these gains partly reflect policy changes targeted at lower-income beneficiaries, who are disproportionately women, they also reflect the introduction of caregiver credits that would mostly benefit women.

How Are Tax and Benefit Changes Distributed?

An important question when evaluating policy proposals is how the costs and benefits of the policy option are distributed across the population. If the goal of the Democratic candidates' Social Security plans is to redistribute resources to needy retirees and people with disabilities, it is instructive to measure the share of new benefits provided by each plan that go to low-income Social Security beneficiaries and the share of new taxes that are paid by high-income taxpayers. Our analysis examines the distribution of new taxes and benefits under each plan in 2065, when the candidates' proposals would be fully implemented.

Change in Taxes by Income

The change in tax revenues generated by each candidate's plan varies because of differences in how they would treat investment income and high-wage earners and how much they would increase taxable Social Security benefits. On the low end, Biden's plan would raise annual taxes by $209 billion in 2065 and Klobuchar's plan would raise annual taxes by $212 billion (table 13). Klobuchar's plan would generate slightly more revenue because it would pay higher Social Security benefits, some of which would be taxable, than Biden's plan. The other plans would increase tax collection much more, with Sanders's plan collecting an additional $464 billion, Buttigieg's collecting an additional $774 billion, and Warren's collecting an additional $915 billion relative to the current law. Sanders's and Warren's plans would both tax investment income, but Warren's would collect nearly twice as much additional tax as Sanders's because hers would impose a higher payroll and investment income tax rate (14.8 versus 12.4 percent) and would tax partnership and S corporation income, unlike the other plans. Buttigieg's plan would apply an additional 17 percent surtax on high earnings in 2065 to achieve Social Security solvency.

All five candidates' plans would concentrate tax increases among high-income taxpayers, with the top 20 percent of taxpayers paying between 74 and 87 percent of the additional tax. In 2065, the top 20 percent of taxpayers would pay 78 percent of the additional tax under both Biden's and Klobuchar's plans. The share of the burden borne by the top 20 percent would be higher under Buttigieg's plan (87 percent) and Warren's plan (84 percent) because Buttigieg's plan would add a surtax on workers with high earnings and Warren's would add a surtax on investment income and partnership and S corporation income, which are highly concentrated among high-income adults. The top 1 percent of taxpayers would pay 62 percent of the additional taxes collected by both Warren's and Buttigieg's plans. Although the payroll and investment income tax increases target upper-income taxpayers, some

taxpayers in the bottom 80 percent of the income distribution would face higher income tax liabilities on the additional Social Security benefits paid by the plans. Taxing up to 85 percent of Social Security benefits requires current beneficiaries to contribute to Social Security and Medicare financing.

TABLE 13

Tax Increases Relative to Current Law, 2065

By total income percentile and reform plan, under payable scenarios

Total income percentile	Biden	Buttigieg	Klobuchar	Sanders	Warren
Total additional taxes (billions of 2018 dollars)	**209**	**774**	**212**	**464**	**915**
Distribution of tax increase (%)					
All	100	100	100	100	100
Bottom quintile	3	2	3	2	1
Second quintile	3	2	3	3	2
Third quintile	7	4	7	9	5
Fourth quintile	8	5	9	12	8
Top quintile	78	87	78	74	84
Bottom 80 percent	22	13	22	26	16
80–90th percentile	4	3	5	7	6
90–95th percentile	7	5	7	6	5
95–99th percentile	19	16	19	13	11
Top 1 percent	48	62	48	48	62

Source: DYNASIM ID980.

Notes: Tax changes are calculated relative to current-law-payable in 2065. Total income includes adjusted gross income plus tax deferred contributions to pension plans, employer paid payroll tax, employer-paid health insurance premiums, tax-exempt interest income, Social Security income excluded from adjusted gross income, Supplemental Security Income, and other nontaxable cash benefits. Total tax includes federal and state income tax, Social Security and Medicare payroll tax (including the additional Medicare tax and the net investment income surtax), and income-related Medicare Part B and Part D premiums above the base premium. Individuals are grouped by current-law tax-unit total income percentile.

Change in Benefits by Lifetime Earnings

Although the candidates' tax changes would be targeted at high-income taxpayers, the spending changes included in their plans would be much more evenly distributed across the earnings distribution. Despite several progressive benefit changes, beneficiaries in the top quintile of lifetime earners would receive between 27 and 31 percent of the additional benefits paid, while beneficiaries in the bottom earnings quintile would receive between 15 and 22 percent of additional benefits (table 14 and figure 20). Of Biden's plan's $386 billion additional expenditure in 2065, 28 percent would be paid to beneficiaries in the top quintile of lifetime earners. Warren's plan adds over two and a half times as much additional spending as Biden's plan ($1,047 billion), and 27 percent would go to the top quintile of lifetime earners. Of Klobuchar's plan's additional $381 billion in spending, 30 percent is paid to top-quintile earners. Buttigieg's and Sanders's plans spend 27 percent and 31 percent, respectively, on top-quintile earners.

TABLE 14

Benefit Increases Relative to Current Law, 2065

By lifetime earnings percentile and reform plan, under payable scenarios

Lifetime earnings percentile	Biden	Buttigieg	Klobuchar	Sanders	Warren
Total additional benefits *(billions of 2018 dollars)*	**386**	**909**	**381**	**863**	**1,047**
Distribution of benefit increase (%)					
All	100	100	100	100	100
Bottom quintile	21	22	17	15	20
Second quintile	16	17	15	16	17
Third quintile	16	16	17	17	17
Fourth quintile	19	18	21	21	19
Top quintile	28	27	30	31	27
Bottom 80 percent	72	73	70	69	73
80-90th percentile	12	11	14	14	12
90-95th percentile	7	6	8	8	7
95-99th percentile	6	6	6	6	5
Top 1 percent	3	4	3	3	3

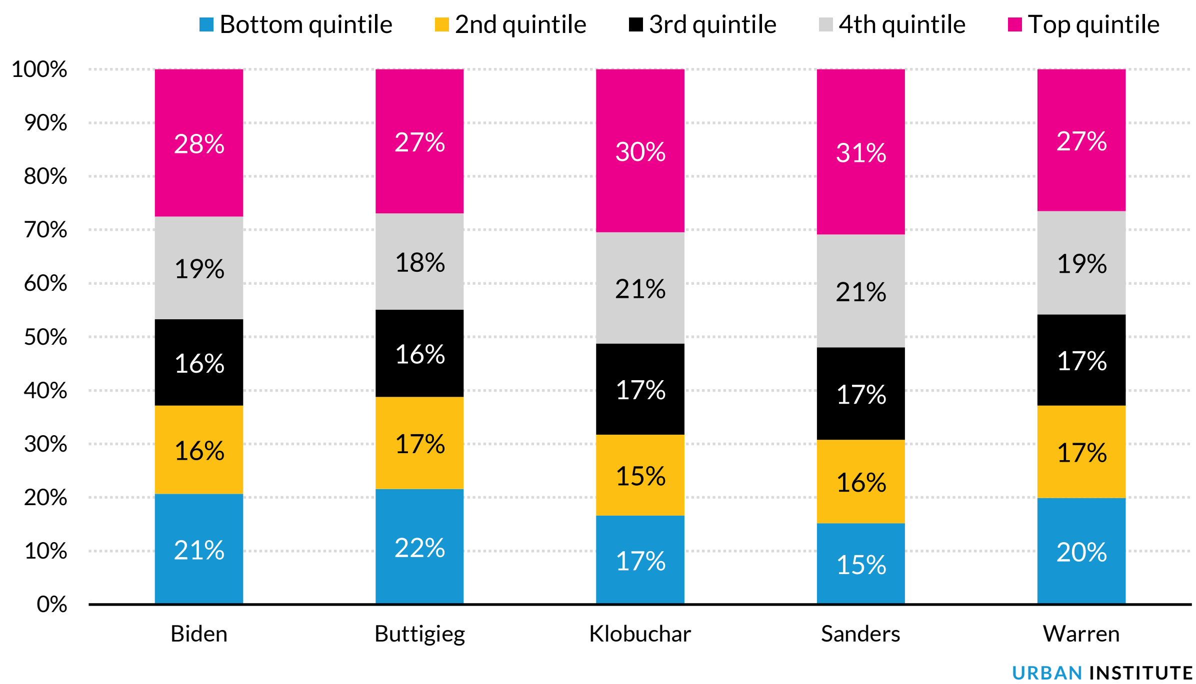
Source: DYNASIM ID980.

Notes: Changes are calculated relative to the current-law-payable scenario in 2065 in billions of 2018 price-adjusted dollars. Benefits include Social Security, Supplemental Security Income, and other cash benefits. The table is limited to people who receive positive benefits in 2065. Couples split earnings and benefits in years they are married.

FIGURE 20

Distribution of the Increase in Total Expenditures Relative to Current Law, 2065 (%)

By lifetime earnings percentile and reform plan, under payable scenarios



Source: DYNASIM ID980.

Notes: Changes are calculated relative to current-law payable in 2065 in billions of 2018 price-adjusted dollars. Total expenditures include Social Security, Supplemental Security Income, and other cash benefits. The table is limited to people with positive expenditures in 2065. Couples split earnings and benefits in years they are married.

Table 15 shows the percentage of the increased Social Security expenditure that would go to beneficiaries in the bottom fifth of the lifetime earnings distribution in 2065 under each reform provision in the candidates' plans, relative to current law. To highlight the impact of benefit provisions and exclude the confounding impact of financing changes, we focus on benefits provided by each plan under scheduled scenarios and compare them with benefits that would be available under the current-law-scheduled scenario. We also show the share of new aggregate benefits relative to current law, combining all provisions with interactions, going to the bottom fifth of lifetime earners. For comparison, we repeat the aggregate benefit analysis for payable scenarios.

More than half of the benefit increases that would be provided by the caregiver credits and between about one-third and one-half of the payments provided by the minimum benefit would go the bottom fifth of lifetime earners. By contrast, the training benefits, COLA increase, PIA increase, long-term beneficiary bonus, and especially repeal of the WEP and GPO spend proportionately less on low lifetime earners. Before benefit reductions required to maintain solvency, 48 percent of new benefits under Klobuchar's plan and 41 percent of new benefits under Buttigieg's plan would go to the bottom fifth of lifetime earners compared with 22 percent under Sanders's plan, 29 percent under Biden's plan, and 31 percent under Warren's plan. Accounting for the benefit reductions required to maintain solvency lowers the share of additional expenditures paid to the bottom fifth of lifetime earners. Compared with current-law payable, middle and high lifetime earners disproportionately benefit from smaller benefit reductions required under each candidates' plans.

TABLE 15

Percentage of Benefit Increases Going to the Bottom Fifth of Lifetime Earners, 2065

By provision and reform plan

Provision	Biden	Buttigieg	Klobuchar	Sanders	Warren
Scheduled scenario					
Increase monthly benefits by $200					21
Increase first PIA bend point				17	
Increase minimum benefit	49	36		48	36
Increase the COLA by tying to the CPI-E	15			15	15
Increase payments to long-term beneficiaries	19				
Income benefits for some survivors	23		23		23
Create caregiver credit	54	52	62		55
Repeal WEP and GPO	4				4
Add student benefit				27	28
Remove minimum age for disabled widow benefits					39
Create job training benefit					8
All provisions combined, including interactions	29	41	48	22	31
Payable scenario					
All provisions combined, including interactions	21	22	17	15	20

Source: DYNASIM ID980.

Notes: COLA = cost-of-living adjustment; CPI-E = consumer price index for the elderly; GPO = Government Pension Offset; PIA = primary insurance amount; SSI = Supplemental Security Income; WEP = Windfall Elimination Provision. Changes are calculated relative to the current law. Total expenditure includes Social Security, SSI, and other cash benefits. The table is limited to people receiving benefits in 2065. Couples split earnings and benefits in years they are married.

Conclusions

In response to Social Security's long-term financing gap and the economic pressures squeezing some older adults and people with disabilities, many candidates for the 2020 Democratic presidential nomination developed detailed plans to reform the program. These plans embody many of the Social Security reform ideas circulating among centrist and left-leaning policymakers and policy analysts.

All the plans we examined would improve Social Security's finances by collecting more revenue from high-income taxpayers, but the plans differ in how much they would raise tax rates and what additional income sources they would tax to help fund Social Security. Biden's plan would raise the least amount of additional revenue, only extending Social Security's payroll tax to earnings above $400,000 a year. Warren's plan would raise taxes most, extending the payroll tax on earnings above $250,000 a year and imposing a higher tax rate on those earnings than on lower earnings. Her plan would also tax investment income received by high-income people and distributions to active participants in partnerships, S corporations, and limited-liability companies, income sources that are not currently subject to Social Security taxes. We project that Warren's plan would raise program revenues about 45 percent relative to current law in 2045 and that these changes would eliminate Social Security's financial shortfall over the next 75 years. Buttigieg's plan, which would eventually tax high-earning workers even more than Warren's plan, is the only other plan we examine that would achieve long-term Social Security solvency. Although the other plans we examine would not eliminate Social Security's long-term financing gap, they would significantly improve Social Security's finances and delay the date when the program trust funds are expected to run out and substantial benefit cuts would be necessary.

The significant tax hikes included in many of these plans could deter economic growth. In the short run, tax increases would reduce disposable income and could limit consumer spending, depressing employment, but this could be partially offset by benefit increases, which increase retirees' disposable income. In the long run, boosting marginal tax rates on wages and investment income can discourage work, entrepreneurial activity, and savings, reducing economic growth. Our analysis does not account for such macroeconomic impacts, which could affect our solvency estimates.

The Democratic plans we examine would use some of the additional revenues they collect to significantly expand Social Security and increase payments to beneficiaries. In 2065, compared with the current law under payable scenarios, program spending would increase about 50 percent under Warren's plan, more than 40 percent under Buttigieg's and Sanders's plans, and nearly 20 percent under Klobuchar's and Biden's plans. The plans would boost median incomes and reduce economic hardship for older adults and people with disabilities, increase lifetime benefits as a share of lifetime earnings, and raise the share of preretirement earnings that Social Security replaces.

Many of the benefit enhancements, including the introduction of a significant minimum benefit and caregiver credits, would target low-income adults. Other benefit provisions, such as the COLA increase, Sanders's PIA increase, and Warren's $200 monthly benefit bonus, would boost payments to all beneficiaries regardless of income. Biden's benefit bump-up for long-term beneficiaries (who are more likely to survive to older ages than younger beneficiaries) and the elimination of the WEP and GPO would favor higher-income beneficiaries. Much of the increased spending provided by the candidates' plans would result from avoiding, at least temporarily, potential benefit cuts prompted by the depletion of Social Security's trust funds. Because those cuts would hit beneficiaries receiving large payments hardest, avoiding the cuts would favor high-income beneficiaries. Overall, more of the additional benefits paid by the candidates' plans would go to beneficiaries in the top fifth of the lifetime earnings distribution than to beneficiaries in the bottom fifth of the distribution.

The timing of benefit increases relative to tax increases affects which generations pay for and benefit from the reforms. Under most of the candidates' plans, people born in the late 1950s and early 1960s would receive many of the added benefits without having to pay much of the cost. Collecting added program revenue from workers largely exempts earlier generations from having to pay for a better-funded system, but those earlier generations would receive higher benefits for much of their retirement. Taxing investment income would force some of today's high-income seniors to contribute to Social Security financing. Plans that rely solely on earnings-based financing relegate more of the financing burden to later cohorts.

Other plan details also matter. Minimum benefits that promise payments equal to 125 percent of the FPL to workers with 30 or more years of work help current beneficiaries more than future beneficiaries. Most people with 30 or more years of work currently receive or will receive incomes above the FPL; most people with income below the FPL, including people with disabilities and caregivers, have worked relatively few years (Favreault 2010, 2018). Reform plans that limit minimum benefits to new beneficiaries help fewer low-income seniors than those that provide minimum benefits to all beneficiaries.

Caregiver credits help many low-income beneficiaries, particularly those who care for disabled spouses and children. These caregivers experience income losses from both their own reduced employment and their disabled family member's lack of employment. Caregiver credits paired with enhanced minimum benefits increase both their own Social Security benefits and the spousal and dependent benefits they generate for eligible family members.

Strengthening protections outside of Social Security could also help low-income older adults and people with disabilities. Modest increases in SSI benefits could cost less than providing caregiver

credits, tying COLAs to the CPI-E, or guaranteeing a minimum benefit, but they could do more to reduce the poverty rate for older adults and people with disabilities than any of those provisions.

Ultimately, the choice between more or less generous retirement and disability supports is a political decision. All the Democratic candidates have opted for a more generous social insurance system and avoid cutting scheduled payments to even the highest-income beneficiaries. Buttigieg's, Sanders's, and Warren's plans show that we can provide retirees and people with disabilities much more generous benefits as long as we are willing to increase program funding. Biden's and Klobuchar's plans are less generous in terms of new benefits but illustrate how modest changes in benefits and financing can nonetheless improve the financial security of older and disabled Americans. Many of the Democratic candidates, including Biden, also propose significant expansions to SSI. Increasing SSI benefits and relaxing eligibility requirements could reduce poverty rates for older adults and people with disabilities more than the minimum benefit increases in many of the candidates' Social Security plans because SSI does not impose a work history requirement.

Many Republican and centrist plans to deal with Social Security's long-term financing gap include benefit cuts, unlike the Democratic candidates' plans. The Social Security Reform Act of 2016, introduced by representative Sam Johnson (R-TX), would increase the program's retirement age, reduce benefits for high-wage workers, and eliminate federal income taxes on Social Security benefits (among other changes).[42] The Bipartisan Policy Center plan would achieve solvency through a mix of tax increases and benefit reductions (Bipartisan Policy Center 2016). A plan proposed by the Committee for a Responsible Federal Budget would reform Social Security to promote work and savings by counting all work years, not just the 35 highest-earning years, in the benefit formula and creating supplemental retirement accounts financed by additional payroll deductions (Goldwein, Macguineas, and Towner 2019). President Donald Trump has recently proposed suspending Social Security payroll taxes, which would further erode trust fund balances without Congressional action to hold the funds harmless. He also proposed permanently eliminating payroll taxes if reelected, which would quickly deplete trust fund reserves and make it impossible to pay Social Security benefits after 2023 (Goss 2020).

The decision about how to address Social Security's long-term financing challenges must be made within a larger budgetary context. Expanding Social Security and reducing the program's shortfall solely through increased revenues will leave federal policymakers with fewer resources to address other budgetary shortfalls, such as Medicare's long-term deficit and the broader federal debt, and to meet other public priorities.

Appendix: Estimated Long-Term Effects of Candidates' Proposals on Social Security's Finances

Appendix tables A.1 to A.5 show our DYNASIM4 projections of how each candidate's reform plan would affect Social Security's long-term finances. These projections are similar to the cost estimates provided by the Social Security Administration's Office of the Chief Actuary.

These tables also show how each plan would change net federal revenue (revenue minus expenditure) from 2021 to 2030, in nominal dollars. Modeled revenues include the federal income tax, Social Security and Medicare payroll tax, net investment income tax, additional Medicare tax, income-related Medicare Part B and Part D premiums above the base premiums, and Social Security net investment income surtax. Modeled expenditures include Social Security benefits, SSI benefits, and other federal cash benefits.

Biden’s Plan

TABLE A.1

Estimated Financial Impact of Biden's Plan

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, tax wages above $400,000 at the 12.4 percent rate. Tax all earnings once the taxable maximum exceeds $400,000. Do not provide benefit credit for additional taxed earnings.	1.84	2.35	593
Beginning in 2021, reconfigure the special minimum PIA for workers becoming newly eligible or dying after 2019: (a) A year of coverage (YOC) is defined as a year in which 4 quarters of coverage are earned. (b) For those becoming newly eligible or dying in 2021 with 30 or more YOCs, set the minimum PIA equal to 125 percent of the 2020 Department of Health and Human Services monthly poverty level. For those with under 30 YOCs, the PIA per YOC in excess of 10 YOCs is 125 percent of this poverty level calculation, divided by 20. (c) For workers becoming newly eligible or dying after 2021, index the initial PIA per YOC by growth in the national average wage index. The 30 and 10 YOC levels apply for all workers, including those who die or become disabled under age 62.	-0.20	-0.42	-25
Beginning in 2021, reduce the dual-earner, single-earner survival benefit disparity by ensuring that widow(er)s automatically receive the highest of: (1) 75% of combined household benefits, capped at the benefit level a household with two workers with average career earnings would receive; (2) 100% of their deceased spouse’s benefits; or (3) 100% of their own worker benefit.	-0.12	-0.09	-138
Use the increase in the Consumer Price Index for the Elderly rather than the increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers to calculate the cost-of-living adjustment (COLA), effective for December 2021 and later COLAs. Social Security Administration estimates this computation would increase the annual COLA by about 0.2 percentage point, on average.	-0.37	-0.49	-122
Beginning in 2021, provide a new “20-year benefit bump-up” that provides an additional benefit equal to 5 percent of an average wage worker in their year of entitlement. The enhancement is phased in over five years (1 percent per year). Eligibility is defined by the earliest eligibility age for retirees and the determination of disability for disabled workers.	-0.19	-0.22	-146

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, provide credit toward Social Security for family and other unpaid caregivers. Caregivers of a child, elderly, or disabled dependent will be awarded up to 5 years of credit toward Social Security benefits as if they earned the half the average earnings of workers outside the home. The credit is reduced by half of wages earned while providing care. Credit can be claimed for caregiving for children under age 12. The credit would be restricted to caregiving before claiming Social Security.	-0.12	-0.23	-8.3
Beginning in 2021, repeal the Windfall Elimination Provision and Government Pension Offset.	-0.15	-0.16	-227
Total scheduled for all provisions including interactions	**0.68**	**0.69**	**-83**
Total payable for all provisions including interactions	**2.42**	**3.38**	**-83**

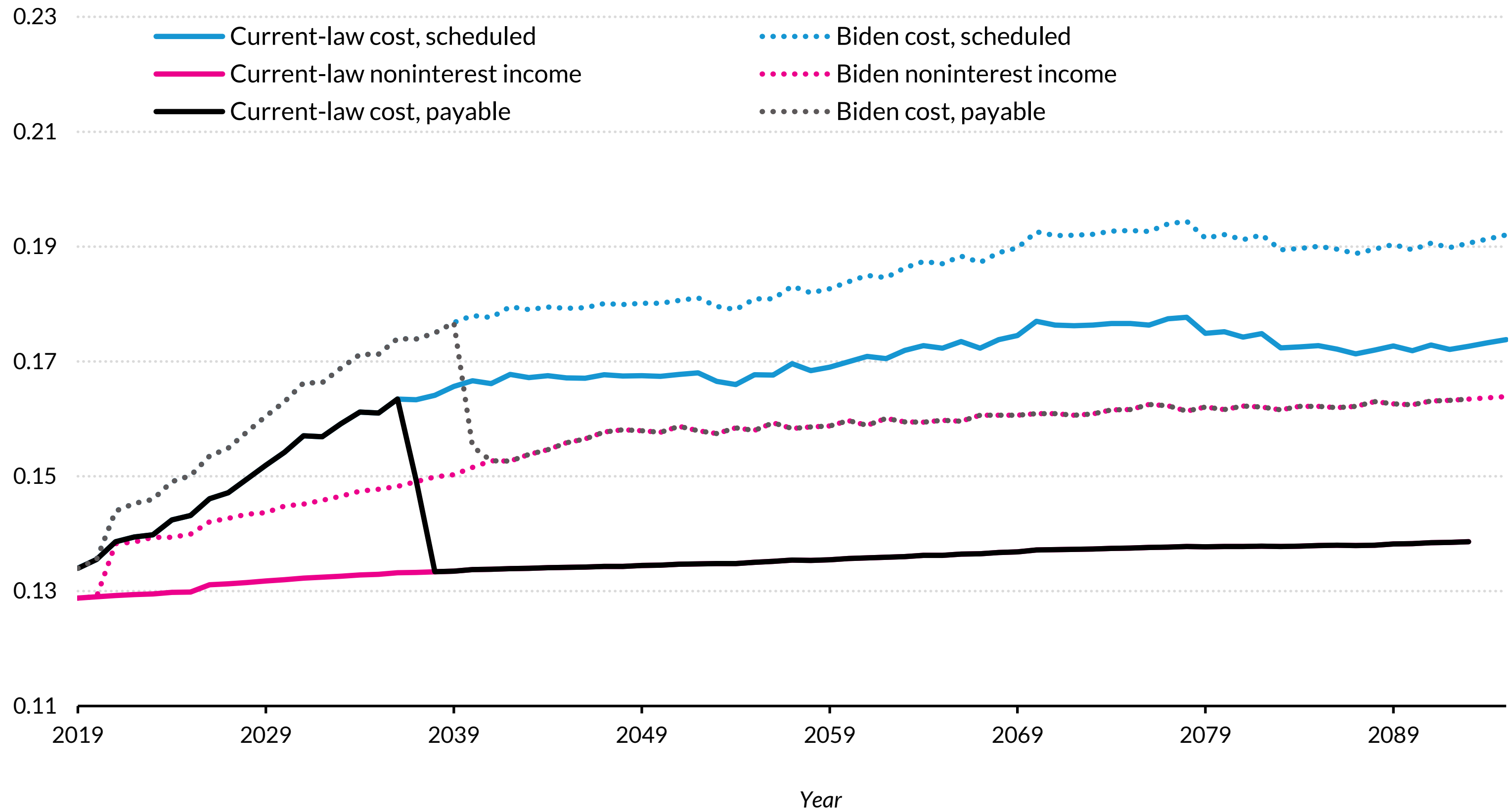
Source: DYNASIM4 ID980.

Notes: Long-term OASDI actuarial balance is the 75-year present value from 2019 to 2093. Modeled revenues include federal income tax, OASDI payroll tax, Medicare payroll tax, net investment income tax, additional Medicare tax, and income-related Medicare Part B and Part D premiums above the base premium. Modeled expenditures include Social Security benefits, Supplemental Security Income benefits, and other cash benefits. The 10-year net federal revenue is modeled revenue minus modeled expenditure from 2021 to 2030 in $billions of nominal dollars.

FIGURE A1

Projected Social Security Costs and Noninterest Income, 2019–95

Current law and Biden's plan, as a percentage of taxable payroll



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Source: DYNASIM4 ID980.

Buttigieg's Plan

TABLE A.2

Estimated Financial Impact of Buttigieg's Plan

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, tax wages above $250,000 at the 12.4 percent rate. Tax all earnings once the taxable maximum exceeds $250,000. Credit the additional earnings for benefit purposes by calculating a second monthly average earnings (AIME+) reflecting only earnings above the taxable maximum. Apply a 2 percent replacement for AIME+ earnings and add this to current-law PIA.	1.97	2.11	959
Automatically increase high earners' payroll tax contributions to keep Social Security solvent without cutting benefits.	2.24	3.25	0
Beginning in 2021, any person who has 30 years of Social Security-covered work will receive an annual benefit of at least 125% of the federal poverty line. (a) A year of coverage (YOC) is defined as a year in which 4 quarters of coverage are earned. (b) For beneficiaries with 30 or more YOCs, set the minimum PIA equal to 125 percent of the Department of Health and Human Services monthly poverty level. For those with under 30 YOCs, the PIA per YOC in excess of 10 YOCs is 125 percent of this poverty level calculation, divided by 20. The 30 and 10 YOC levels apply for all workers, including those who die or become disabled before age 62.	-1.00	-0.42	-1,384
Beginning in 2021, provide credit toward Social Security for family and other unpaid caregivers. Caregivers of a child, elderly, or disabled dependent will be awarded credit toward Social Security benefits as if they earned the average earnings of workers outside the home, with no limits on the number of years for which caregivers can claim the credit. Credit can be claimed for caregiving for children under age 18. The credit would be restricted to caregiving before claiming Social Security.	-0.51	-1.06	-21
Total for all provisions including interactions (scheduled and payable)	2.39	3.38	-445

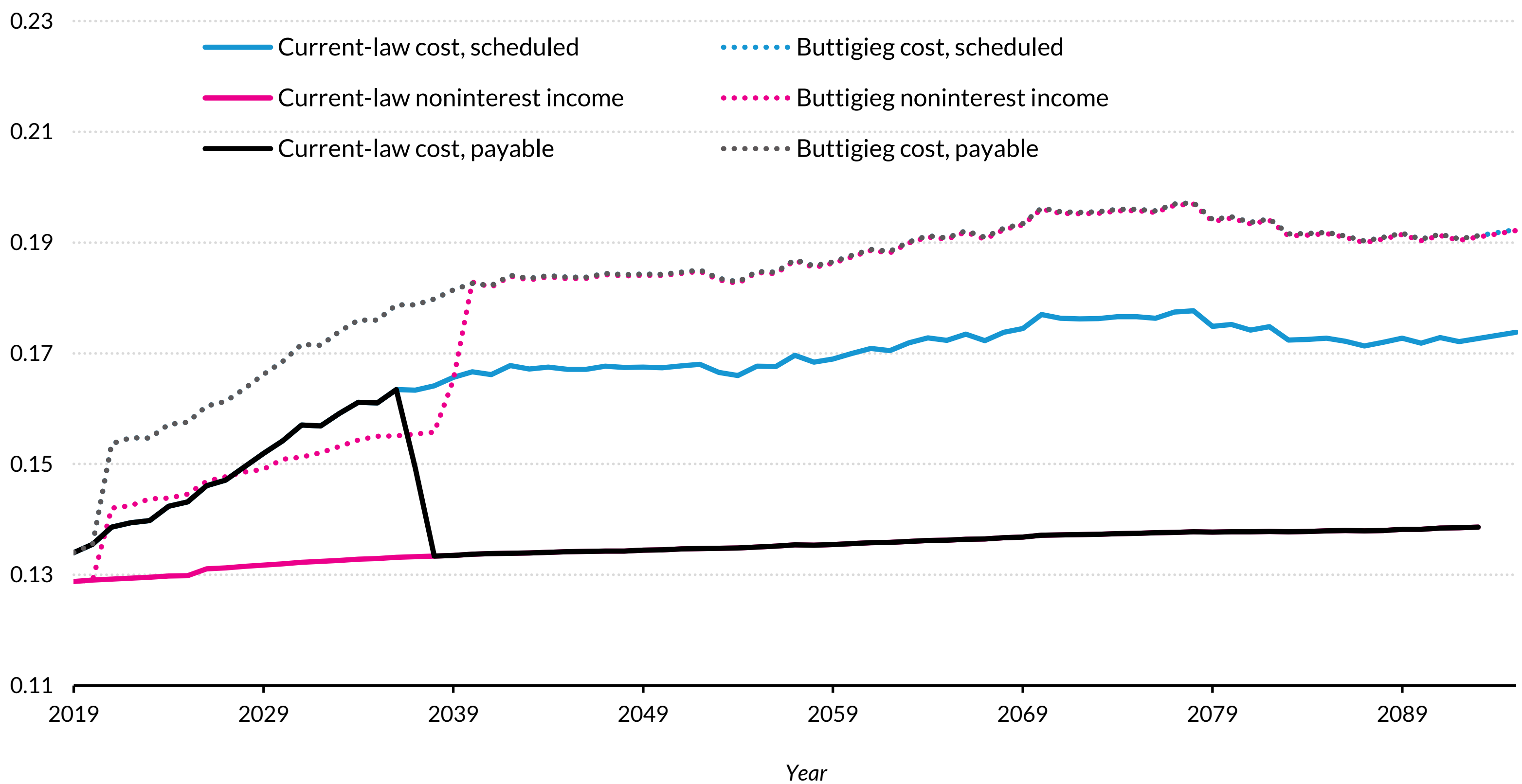
Source: DYNASIM4 ID980.

Notes: Long-Term OASDI actuarial balance is the 75-year present value from 2019 to 2093. Modeled revenues include federal income tax, OASDI payroll tax, Medicare payroll tax, net investment income tax, additional Medicare tax, and income-related Medicare Part B and Part D premiums above the base premium. Modeled expenditures include Social Security benefits, Supplemental Security Income benefits, and other cash benefits. The 10-year net federal revenue is modeled revenue minus modeled expenditure from 2021 to 2030 in $billions of nominal dollars.

FIGURE A.2

Projected Social Security Costs and Noninterest Income, 2019–95

Current law and Buttigieg's plan, as a percentage of taxable payroll



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Source: DYNASIM4 ID980.

Klobuchar's Plan

TABLE A3

Estimated Financial Impact of Klobuchar's Plan

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, tax wages above $250,000 at the 12.4 percent rate. Tax all earnings once the taxable maximum exceeds $250,000. Do not provide benefit credit for additional taxed earnings.	2.05	2.35	959
Beginning in 2021, reduce the dual-earner, single-earner survival benefit disparity by ensuring that widow(er)s automatically receive the highest of: (1) 75% of combined household benefits, capped at the benefit level a household with two workers with average career earnings would receive; (2) 100% of their deceased spouse's benefits; or (3) 100% of their own worker benefit.	-0.12	-0.09	-138
Beginning in 2021, provide credit toward Social Security for family and other unpaid caregivers. Caregivers of a child, elderly, or disabled dependent will be awarded credit toward Social Security benefits as if they earned half the average earnings of workers outside the home, with no limits on the number of years for which caregivers can claim the credit. Credit can be claimed for caregiving for children under age 6. The credit would be restricted to caregiving before claiming Social Security.	-0.12	-0.27	-5
Total scheduled for all provisions including interactions	1.81	1.99	816
Total payable for all provisions including interactions	2.44	3.40	816

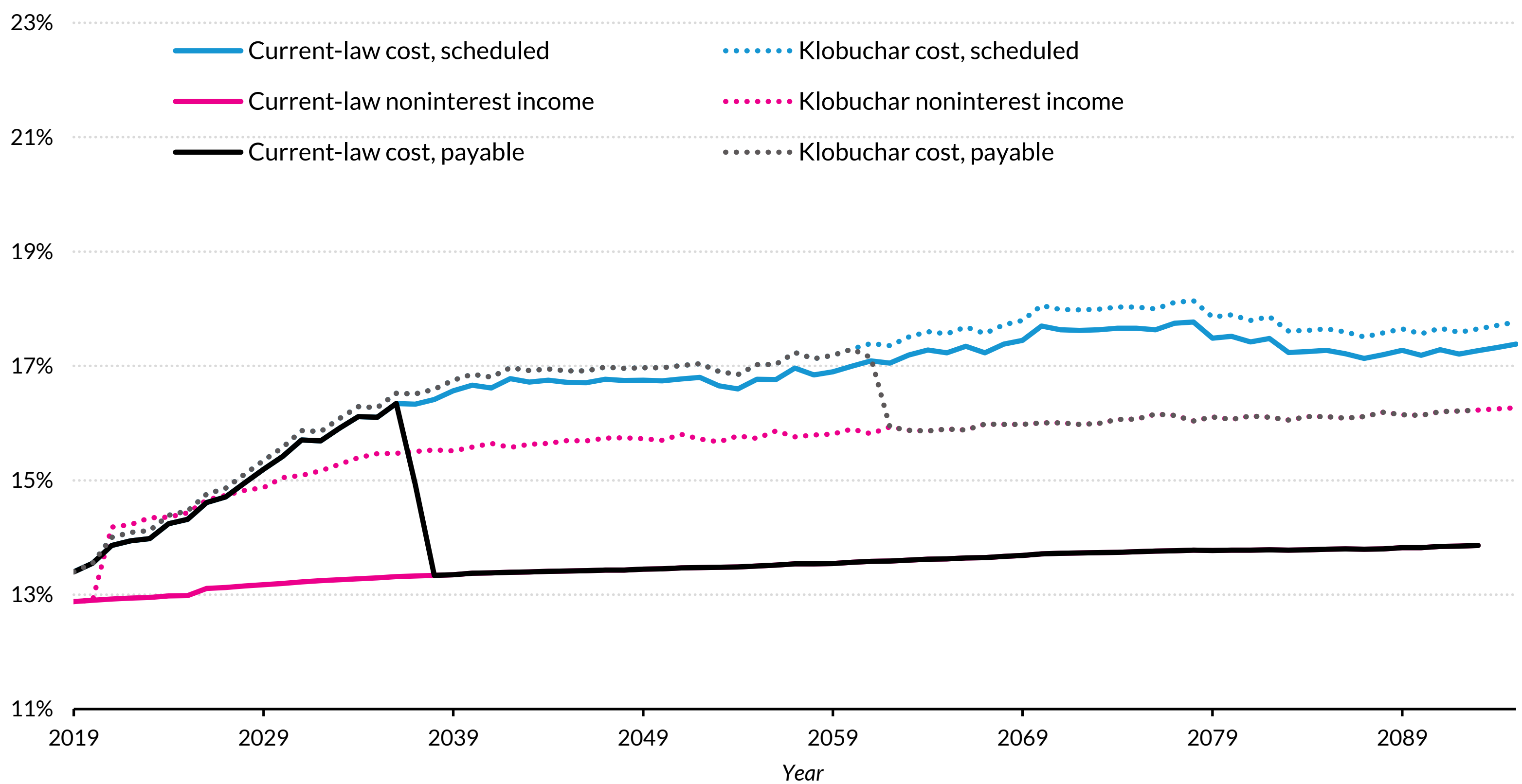
Source: DYNASIM4 ID980.

Notes: Long-Term OASDI actuarial balance is the 75-year present value from 2019 to 2093. Modeled revenues include federal income tax, OASDI payroll tax, Medicare payroll tax, net investment income tax, additional Medicare tax, and income-related Medicare Part B and Part D premiums above the base premium. Modeled expenditures include Social Security benefits, Supplemental Security Income benefits, and other cash benefits. The 10-year net federal revenue is modeled revenue minus modeled expenditure from 2021 to 2030 in $billions of nominal dollars.

FIGURE A3

Projected Social Security Costs and Noninterest Income, 2019–95

Current law and Klobuchar's plan, as a percentage of taxable payroll



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Source: DYNASIM4 ID980.

Sanders's Plan

TABLE A4

Estimated Financial Impact of Sanders's Plan

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2020, tax wages above $250,000 at the 12.4 percent rate. Tax all earnings once the taxable maximum exceeds $250,000. Do not provide benefit credit for additional taxed earnings.	2.07	2.35	959
Beginning in 2020, apply a separate 6.2 percent tax on investment income as defined in the Affordable Care Act (ACA), with unindexed thresholds as in the ACA ($200,000 single filer, $250,000 for married filing joint). Tax the lesser of investment income or Modified Adjusted Gross Income above these thresholds. Proceeds go to the OASDI trust funds.	1.03	1.34	748
Beginning in 2020, reconfigure the special minimum PIA for workers becoming newly eligible or dying after 2019: (a) A year of coverage (YOC) is defined as a year in which 4 quarters of coverage are earned. (b) For those becoming newly eligible or dying in 2020 with 30 or more YOCs, set the minimum PIA equal to 125 percent of the 2019 Department of Health and Human Services monthly poverty level. For those with under 30 YOCs, the PIA per YOC in excess of 10 YOCs is 125 percent of this poverty level calculation, divided by 20. (c) For workers becoming newly eligible or dying after 2020, index the initial PIA per YOC by growth in the national average wage index. The 30 and 10 YOC levels apply for all workers, including those who die or become disabled under age 62.	-0.21	-0.44	-31
Use the increase in the Consumer Price Index for the Elderly rather than the increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers to calculate the cost-of-living adjustment (COLA), effective for December 2021 and later COLAs. Social Security Administration estimates this computation would increase the annual COLA by about 0.2 percentage point, on average.	-0.37	-0.49	-100
Beginning in 2021, continue benefits for children of disabled or deceased workers until they attain age 22 if the child is in high school, college or vocational school.	-0.05	-0.05	-43
Increase the first PIA bend point above the current-law level for workers becomingly newly eligible for retirement or disability benefits or dying after 2024. Phase in an ultimate 15-percent increase in the first bend point by raising it 1 percent above the current-law level for workers becoming newly eligible or dying in 2025, 2 percent for workers becoming newly eligible or dying in 2026, and so on, until it reaches 15 percent for workers becoming newly eligible or dying in 2039 and later.	-0.38	-0.65	-7

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, establish a new Social Security trust fund by combining the reserves of the separate OASI and DI trust funds and managing all future operations of the program on a combined basis.	0	0	0
Total scheduled for all provisions, including interactions.	2.12	2.09	1,526
Total payable for all provisions, including interactions	2.41	3.39	1,526

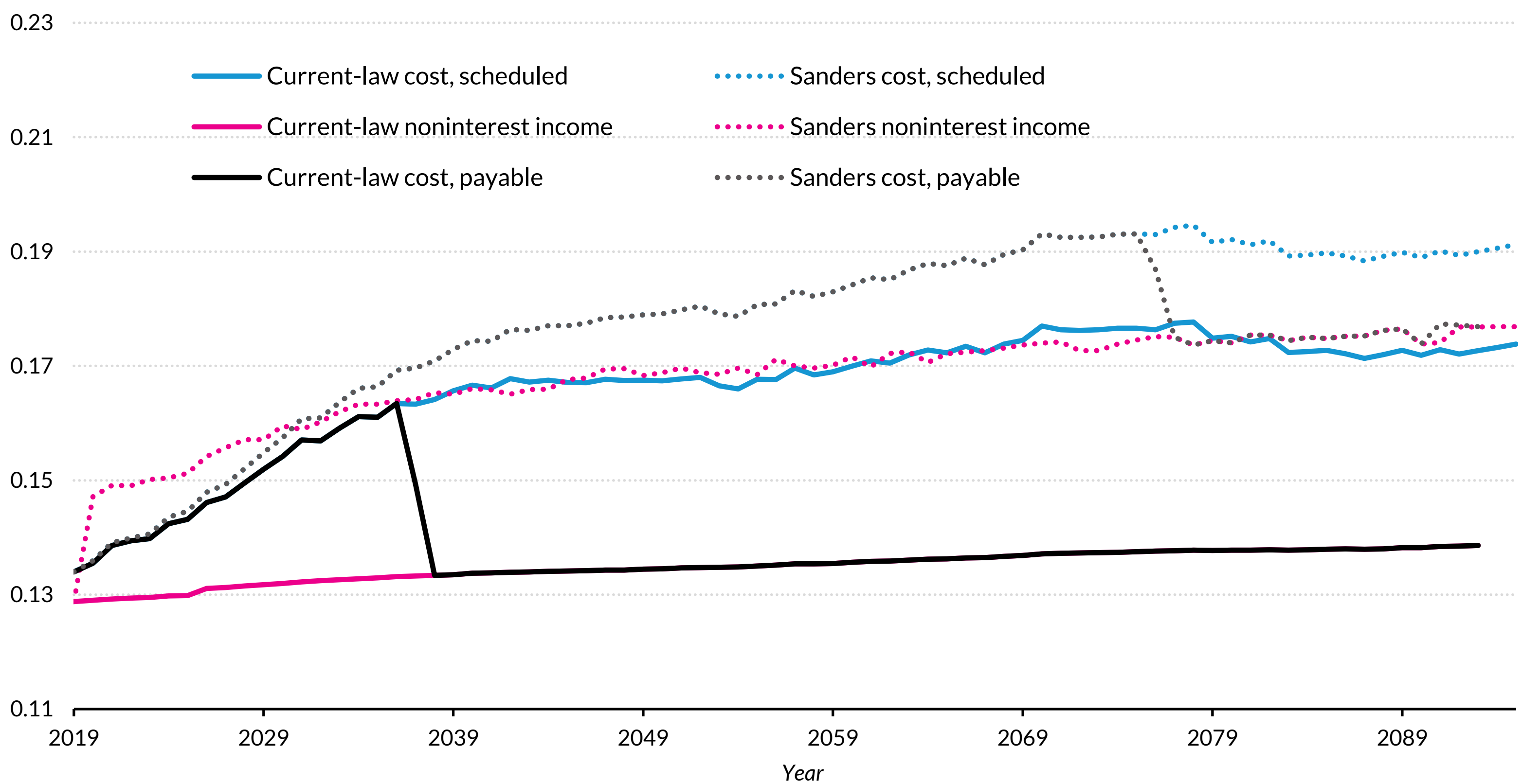
Source: DYNASIM4 ID980.

Notes: Long-Term OASDI actuarial balance is the 75-year present value from 2019 to 2093. Modeled revenues include federal income tax, OASDI payroll tax, Medicare payroll tax, net investment income tax, additional Medicare tax, income-related Medicare Part B and Part D premiums above the base premium, and Social Security net investment income surtax. Modeled expenditures include Social Security benefits, Supplemental Security Income benefits, and other cash benefits. The 10-year net federal revenue is modeled revenue minus modeled expenditure from 2021 to 2030 in $billions of nominal dollars.

FIGURE A4

Projected Social Security Costs and Noninterest Income, 2019–95

Current law and Sanders's plan, as a percentage of taxable payroll



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Source: DYNASIM4 ID980.

Warren’s Plan

TABLE A5

Estimated Financial Impact of Warren’s Plan

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Beginning in 2021, tax wages above $250,000 at the 14.8 percent rate. Tax all earnings once the taxable maximum exceeds $250,000. Do not provide benefit credit for additional taxed earnings.	2.42	2.77	1,173
Beginning in 2021, apply a separate 14.8 percent tax on investment income as defined in the Affordable Care Act (ACA), with unindexed thresholds as in the ACA ($250,000 single filers, $400,000 for married filers). Tax the lesser of net investment income or Modified Adjusted Gross Income above these thresholds. Proceeds go to the OASDI trust funds.	2.21	3.05	1,432
Broaden the investment income tax base to include gross income and gains from any trades or businesses of an individual not otherwise subject to the payroll tax. This would modify the current definition of net investment income to include the distributions received by active S corporation shareholders, active limited partners, and active LLC members, and the proceeds from the sale of business property by non-trading active business partners.	0.25	0.30	242
Beginning in 2021, any person who has done 30 years of Social Security-covered work will receive an annual benefit of at least 125% of the federal poverty line. (a) A year of coverage (YOC) is defined as a year in which 4 quarters of coverage are earned. (b) For beneficiaries with 30 or more YOCs, set the minimum PIA equal to 125 percent of the Department of Health and Human Services monthly poverty level. For those with under 30 YOCs, the PIA per YOC in excess of 10 YOCs is 125 percent of this poverty level calculation, divided by 20. The 30 and 10 YOC levels apply for all workers, including those who die or become disabled under age 62.	-1.00	-0.42	-1,384
Beginning in 2021, reduce the dual-earner, single-earner survival benefit disparity by ensuring that widow(er)s automatically receive the highest of: (1) 75% of combined household benefits, capped at the benefit level a household with two workers with average career earnings would receive; (2) 100% of their deceased spouse’s benefits; or (3) 100% of their own worker benefit.	-0.12	-0.09	-138
Beginning in 2021, provide credit toward Social Security for family and other unpaid caregivers. Caregivers of a child, elderly, or disabled dependent will be awarded credit toward Social Security benefits as if they earned the average earnings of workers outside the home, with no limits on the number of years for which caregivers can claim the credit. Credit can be claimed for caregiving for children under age 6. The credit would be restricted to caregiving before claiming Social Security.	-0.30	-0.67	-13

Provision	Change in long-term OASDI actuarial balance (% of payroll)	Change in annual balance for 75th year (% of payroll)	Ten-year change in net federal revenue (2021-2030, ($ billions, nominal)
Use the increase in the Consumer Price Index for the Elderly rather than the increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers to calculate the cost-of-living adjustment (COLA), effective for December 2021 and later COLAs. Social Security Administration estimates this computation would increase the annual COLA by about 0.2 percentage point, on average.	-0.37	-0.49	-122
Beginning in 2021, $200 per month increase in Social Security benefits. All current and future Social Security benefits will be eligible for and receive at least $200 more.	-0.76	-0.15	-1510
Beginning in 2021, repeal the Windfall Elimination Provision and Government Pension Offset.	-0.15	-0.16	-227
Beginning in 2021, continue benefits for children of retired, disabled, or deceased workers until they attain age 24 if the child is in high school, college or vocational school.	-0.06	-0.06	-52
Beginning in 2021, eliminate minimum age for widow(er)s with disabilities. Currently, a widow(er) with disabilities must wait until age 50 to start claiming Social Security survivor benefits if a spouse dies. Repeal the age requirement so widow(er)s with disabilities can receive their full survivor benefits at any age and without a reduction.	-0.03	-0.02	-42
Provide a job training credit. Let workers in job training and apprenticeship programs elect to exclude up to three years in those programs from their lifetime earnings calculation for Social Security benefits, thereby producing a higher average lifetime earnings total.	-0.02	-0.04	0
Total for all provisions (scheduled and payable)	2.70	4.72	159

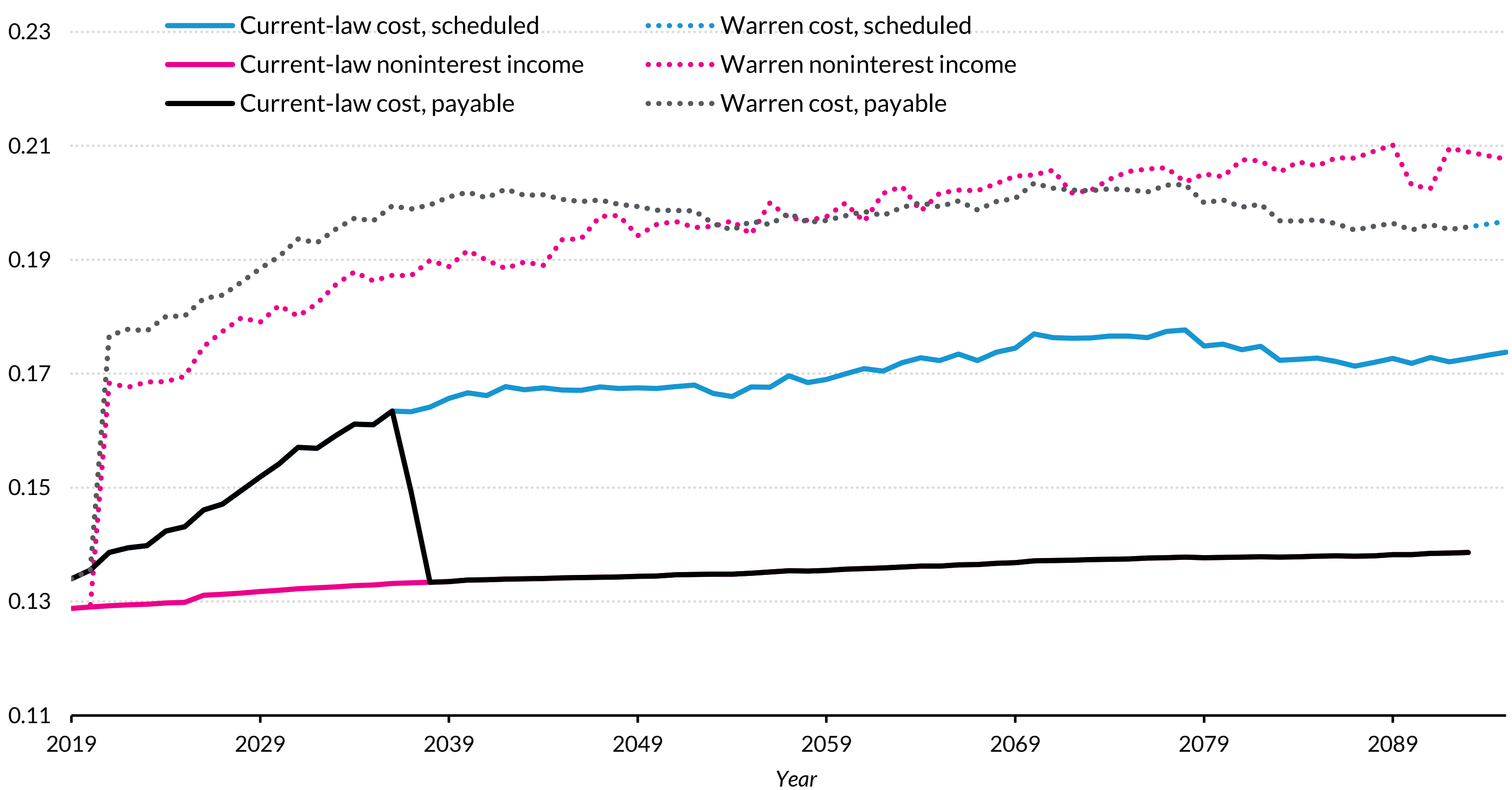
Source: DYNASIM4 ID980.

Notes: Long-Term OASDI actuarial balance is the 75-year present value from 2019 to 2093. Modeled revenues include federal income tax, OASDI payroll tax, HI payroll tax, net investment income tax, additional Medicare tax, income-related Medicare Part B and Part D premiums above the base premium, and Social Security net investment income surtax. Modeled expenditures include Social Security benefits, Supplemental Security Income benefits, and other cash benefits. The 10-year net federal revenue is modeled revenue minus modeled expenditure from 2021 to 2030 in $billions of nominal dollars.

FIGURE A5

Projected Social Security Costs and Noninterest Income, 2019–95

Current law and Warren's plan, as a percentage of taxable payroll



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Source: DYNASIM4 ID980.

Note: Warren's scheduled and payable costs are the same, so those two lines overlap.

Notes

[1] "Monthly Statistical Snapshot, July 2020," Social Security Administration, August 2020, https://www.ssa.gov/policy/docs/quickfacts/stat_snapshot/index.html?qs.

[2] "Monthly Statistical Snapshot, July 2020," Social Security Administration, August 2020.

[3] The Social Security 2100 Act, H.R. 860, 116th Cong. (2019). The Senate version of the bill is S. 269, 116th Cong. (2019).

[4] The Social Security discussion in a draft party platform, released in July 2020, closely mirrored text from the Biden-Sanders Unity task force recommendations. See "2020 Democratic Party Platform," DemConvention.com, uploaded July 21, 2020, https://www.demconvention.com/wp-content/uploads/2020/07/2020-07-21-DRAFT-Democratic-Party-Platform.pdf ; and "Biden-Sanders Unity Task Force Recommendations," Biden 2020 presidential campaign, accessed October 5, 2020, https://assets.documentcloud.org/documents/6983111/UNITY-TASK-FORCE-RECOMMENDATIONS.pdf.

[5] The Trump administration has not proposed significant changes to Social Security. However, the president's 2021 budget proposal, released in February 2020, would tighten eligibility for Social Security disability benefits and require the Social Security Administration to review disability beneficiaries more frequently to ensure that they remain unable to work and eligible for payments (Office of Management and Budget 2020).

[6] See, for example, Diamond and Orszag (2004).

[7] In years without a COLA, the maximum taxable earnings does not increase, even if the average wage index increases. This occurred in 2010, 2011, and 2016.

[8] For the full retirement age schedule and reduction factors by birth year, see "Benefits Planner: Retirement | Retirement Age and Benefit Reduction | SSA," US Social Security Administration, accessed October 8, 2020, https://www.ssa.gov/planners/retire/agereduction.html.

[9] The Congressional Budget Office (2019) projected a larger shortfall, equivalent to 4.6 percent of taxable payroll. Those projections do not account for the COVID-19 pandemic.

[10] "Social Security Expansion Act," S. 478, 116th Cong. (2019).

[11] Biden's caregiver provisions are described in "The Biden Plan for Full Participation and Equality for People With Disabilities," and his Social Security provisions are described in "The Biden Plan for Older Americans," available on the campaign website (https://www.joebiden.com). Buttigieg's provisions are described in "Dignity and Security in Retirement." Klobuchar's provisions are described in "Senator Klobuchar's Plan for Seniors." Warren's provisions are described in "Evaluating Senator Warren's Social Security Plan."

[12] We did not receive a response from the Klobuchar campaign.

[13] In 2019, the Social Security trustees projected that the taxable maximum would exceed $250,000 in 2035 and $400,000 in 2048 (Board of Trustees 2019).

[14] S corporations are corporations with no more than 100 shareholders that elect to pass corporate income, losses, deductions, and credits through to their shareholders for federal tax purposes. See US Department of the Treasury (2016) for more information on investment income and the employment tax base.

[15] The minimum benefit would be based on the poverty guidelines published each year by the US Department of Health and Human Services. The proposal defines a year of employment as a year in which a worker earns four quarters of coverage. In 2020, workers earned a quarter of coverage by earning $1,410 in covered employment. The minimum benefit would equal 6.25 percent of the FPL for beneficiaries with 10 years of covered

employment, and it would increase by 6.25 percent of the FPL with each additional year of covered employment, until it reaches 125 percent for those with 30 years of covered employment.

[16] "Description of Proposed Provision: A6: Starting December 2021, Compute the COLA Using the Consumer Price Index for the Elderly (CPI-E)," Social Security Administration, accessed October 5, 2020, https://www.ssa.gov/oact/solvency/provisions/charts/chart_run092.html.

[17] Whitman and Shoffner (2013) discuss differences between old-age benefit supplements that are tied to the average benefit compared to one's own benefit.

[18] Proposals seeking to reduce this type of inequity have been advanced since at least the 1970s (US Department of Health, Education, and Welfare 1979).

[19] Caregiver credits may not increase payments to spouse and survivor beneficiaries who collect benefits based on their (deceased) spouse's earnings or to workers whose credited earnings do not displace any of their top 35 years of earnings.

[20] Equal Treatment of Public Servants Act, H.R. 6933, 115th Cong. (2018); Social Security 2100 Act, H.R. 860, 116th Cong. (2019).

[21] Beginning in 1939, Social Security paid dependent benefits up to age 18, when children were no longer considered dependent. In 1965, Social Security expanded benefits to full-time students up to age 22, who often still depended on parental support. However, many observers perceived these student benefits, which totaled more than $1.3 million to almost 900,000 students in 1977, as a form of student aid. Although the benefit was popular among parents and students, it depended on self-reports of school enrollment and could be abused (DeWitt 2001). Social Security child benefits for full-time students older than 18 were eliminated in 1981.

[22] In 2018, Social Security paid disabled widow and widower benefits to about 255,000 people, less than 1 percent of the Social Security beneficiary population (Social Security Administration 2019a, table 5.A1).

[23] We make this adjustment for illustrative purposes. As Huston (2020) discusses, it is unclear what actions the Social Security Administration would take if the program becomes insolvent.

[24] We classify the income-related portion of Medicare premiums as a tax because higher-income beneficiaries who pay higher premiums than lower-income beneficiaries do not receive any additional benefits.

[25] Changes to Social Security can affect eligibility for SSI and spending on that program.

[26] The federal government tracks two slightly different poverty measures. The poverty guidelines determine eligibility for income-based programs, and the poverty thresholds determine poverty rates. We follow that convention in our modeling.

[27] For example, the National Academies of Sciences, Engineering, and Medicine (2015) and Favreault (2019) consider survivors to age 51. Other literature considers all people regardless of survival age.

[28] The Social Security Advisory Board's Technical Panel on Assumptions and Methods has highlighted the potential importance of this assumption (2011 Technical Panel on Assumptions and Methods 2011; 2019 Technical Panel on Assumptions and Methods 2019).

[29] More information about DYNASIM4, including documentation, reports, and interactive validation tools, is available at https://www.urban.org/policy-centers/cross-center-initiatives/program-retirement-policy/projects/dynasim-projecting-older-americans-future-well-being.

[30] "Brief Description of the Tax Model," Urban-Brookings Tax Policy Center, last updated August 23, 2018, https://www.taxpolicycenter.org/resources/brief-description-tax-model.

[31] Self-employed workers, who pay both halves of the payroll tax, may be especially responsive.

[32] For workers facing a payroll tax increase of less than $10,000, we shift 1 percent of their earnings above the second tier threshold to tax-exempt compensation. The rate increases by 1 percentage point for each additional $5,000 of payroll tax liability until it reaches 10 percent for payroll tax increases of $55,000 or more.

[33] "Brief Description of the Tax Model," Urban-Brookings Tax Policy Center, last updated August 23, 2018, https://www.taxpolicycenter.org/resources/brief-description-tax-model.

[34] In 2019, the Social Security actuaries projected, based on their intermediate assumptions, that the program faces a 75-year actuarial deficit of 2.78 percent of taxable payroll and the trust funds will run out in 2035 (Board of Trustees 2019). DYNASIM projects more revenue from taxation of benefits than the actuaries, which generates a smaller actuarial deficit.

[35] We assume that this surcharge would be collected through federal income tax filings without any employer contributions.

[36] We use the training model developed for AARP's Innovation Challenge to impute job training (Whitman 2018). This model uses estimates of the probability of receiving training from ages 30 to 64 estimated from the Panel Study of Income Dynamics. The probability of seeking and completing training is higher for younger adults, women, and people who attended college but did not earn a degree than for other people.

[37] The Social Security actuaries (provision A3) assume the chained CPI will be 0.3 percentage points lower on average than the CPI-W.

[38] DYNASIM4 models state income tax revenue, but our analysis of federal revenues generated by each reform plan considers only federal taxes.

[39] The analysis considers only spending on Social Security benefits, SSI benefits, and other government benefit programs, including unemployment benefits, veteran's benefits, sickness payments, worker's compensation, and TANF and other welfare payments.

[40] Leimer (1995) discusses how various analytical choices can affect estimates of money's worth measures.

[41] For further discussion of replacement rates and review of the literature on alternative specifications, see Johnson and Favreault (2020).

[42] Social Security Reform Act of 2016, H.R. 6489, 114th Cong. (2016).

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Smith has written extensively on demographic and economic trends, and their implications for the retirement well-being of current and future cohorts. She has contributed chapters to numerous books, including *Closing the Deficit: How Much Can Later Retirement Help?; Redefining Retirement: How Will Boomers Fare?; Reshaping Retirement Security: Lessons from the Global Financial Crisis;* and *Social Security and the Family*. She has also published articles in various scholarly journals, including the *Social Security Bulletin*, *National Tax Journal*, and *Journal of Aging & Social Policy*. She has served on advisory panels for the National Academy of Science, Canadian Employment and Social Development Department, Brookings Institution, and Mathematica Policy Research.

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