Social Security's Role in the Federal Debt Explosion: Past, Present, and the Reform Imperative

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Abstract

Social Security is not just the largest federal program but also a key contributor to the United States' fiscal imbalance. This chapter argues that the program's financing challenge does not stem solely from demographic shifts but also from its earnings-related benefit design, real benefit growth over time, and political inertia that has delayed structural reform. Since 2010, Social Security has run continuous cash-flow deficits, adding more than $1.5 trillion to the national debt, with projections of $3.4 trillion more by 2032. From a unified budget perspective, the program's 75-year unfunded obligation totals $32 trillion. Drawing on international experience, and the Cato Social Security model, this chapter evaluates policy options that could reduce the program's contributions to structural US deficits and debt.

Keywords: Social Security, federal debt, Social Security trust fund, population aging, political economy

JEL codes: H55, H60, J14, J26, J32

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Social Security is the largest US federal program, accounting for 22.5% of total US federal government spending in 2025, or 5.2% of gross domestic product (GDP). Under both the Social Security Administration's and the Congressional Budget Office's (CBO) projections, assuming the program continues to pay scheduled benefits, Social Security is projected to absorb a growing share of economic output over time, with its spending rising to about 6% of GDP by 2056 (Board of Trustees 2026; CBO 2026a).[1]

Social Security has run continuous cash-flow deficits since 2010, contributing to federal deficits and debt. In the Appendix, we show that, after accounting for the interest costs associated with the debt generated by these cash-flow shortfalls, the program added more than $1.5 trillion to federal debt between 2010 and 2025, and is projected to add another $3.4 trillion by 2032, when the trust fund is projected to be depleted.

From a unified budget perspective, the program's 75-year unfunded obligation totals $32 trillion. That is the present value of the difference between the benefits that Congress has promised and what the government expects to collect in dedicated taxes. The program also faces a $74-trillion infinite-horizon unfunded obligation, representing the present value of the additional funding needed to finance the program in perpetuity (Authors' calculations; Board of Trustees 2026).

Social Security's growing financing shortfall is occurring against the backdrop of a broader deterioration in the federal fiscal outlook, characterized by large federal deficits, publicly held debt at 100% of GDP and rising, and historically high interest costs (CBO 2026a).

This chapter makes two key contributions. First, it highlights Social Security's role in the worsening US fiscal outlook by focusing on its annual cash-flow deficits that add directly to federal deficits and debt. Second, it demonstrates that the program's financing problem is not solely a product of well-known demographic pressures. We argue that benefit design choices, together with political incentives that have both worsened the program's finances and delayed structural reform, are key drivers of Social Security's long-term imbalance.

Social Security policy debates often focus on the program's projected insolvency date, currently 2032, when its Old-Age and Survivors Insurance (OASI) trust fund will exhaust its reserves and trigger benefit cuts of about 22% (Board of Trustees 2026). Yet these reserves, composed entirely of special-issue securities issued by the US Department of the Treasury (hereafter, the Treasury), have no cash value and matter only in the intragovernmental accounting context. Evaluating the program from a unified budget perspective rather than from a trust fund perspective provides a clearer picture of how Social Security already contributes to federal borrowing. When Social Security redeems special-issue securities to cover its cash-flow shortfalls, the Treasury must borrow from the public to finance those redemptions.

We analyze how earnings-related benefits, substantial windfalls to early retiree cohorts, real benefit growth over time, and outdated inflation adjustments contribute to the program's growth and to persistent funding shortfalls. This chapter also highlights the political economy forces that have produced these outcomes. Drawing on public choice theory, we explain why policymakers may continue to rely on borrowing (after trust fund exhaustion) rather than enact politically costly changes.

We then demonstrate the negative fiscal and economic consequences of debt-financed Social Security and show that, while stronger economic growth can partially alleviate the program's financing challenges, it is unlikely to close the funding gap on its own.

We argue that structural reforms are necessary. Drawing on international experiences from Canada, Germany, New Zealand, and Sweden, a selection of Organisation for Economic Co-operation and Development (OECD) countries that have adopted reforms since the 1990s (GAO 2008), we outline policy options that reduce benefit costs, more closely align the program with demographic realities, and limit reliance on future borrowing.

These reform options are evaluated using the Cato Institute's Social Security model, which focuses exclusively on the OASI program.[2]

Beyond Trust Fund Accounting

Social Security is a pay-as-you-go (PAYG) program, in which current revenues from payroll taxes and the taxation of benefits (hereafter, tax revenues) finance current retirees' benefits. The 1983 Social Security reforms, which accelerated scheduled payroll tax increases, delayed cost-of-living adjustments and introduced benefit taxation, among other changes (Schieber and Shoven 1999, pp. 192–203), generated temporary cash-flow surpluses—defined as tax revenues exceeding total program expenditures. These surpluses were credited to the Social Security trust funds in the form of non-marketable, special-issue securities. The interest earned on these securities is likewise credited in the form of special-issue securities (Pattison 2015).

Between 1983 and 2009 (the last year in which the program's combined Old-Age and Survivors Insurance and Disability Insurance (OASDI) trust funds recorded a cash-flow surplus), the surpluses and accrued interest totaled $2.5 trillion in Treasury securities (Board of Trustees 2026). These holdings, which the Social Security Administration (SSA) refers to as 'reserves,' are effectively intragovernmental IOUs: claims on the Treasury backed by prior cash-flow surpluses and accrued interest.

Throughout this chapter, we use three distinct metrics commonly used to analyze Social Security's finances: cash-flow balance, trust fund solvency, and unfunded obligation. Table 1 defines each concept.

Table 1 here

Past Social Security surpluses and publicly held debt. A critical feature of the Treasury-trust fund arrangement is that the federal government has used past cash-flow surpluses for non-Social Security purposes. Assuming other government spending and revenues were unchanged, these surpluses would have increased national saving by decreasing publicly held debt. Empirical evidence, however, does not support this assumption.

Smetters (2004) found that Social Security surpluses likely enabled Congress to increase spending or decrease taxes elsewhere in the federal budget, more than offsetting the surpluses and increasing publicly held debt. Similarly, Nataraj and Shoven (2004) found that surpluses across all federal trust funds have largely been offset by increased deficits in the rest of the government.

Thus, trust fund reserves reflect past surpluses that provided no lasting fiscal improvement and, in fact, may have worsened the long-term US fiscal outlook by facilitating the expansion of federal entitlement programs and tax reductions, adding permanent and growing federal liabilities.

Social Security's current contribution to federal debt. Since 2010, the Social Security system has run cash-flow deficits, requiring the redemption of the intragovernmental IOUs to cover benefits. In principle, Congress could have offset those shortfalls through spending cuts or tax increases elsewhere, in which case Social Security deficits would not have translated into additional borrowing. Yet this did not happen. To finance IOU redemptions, the Treasury has been borrowing from the public, increasing publicly held debt.

Given the rapidly deteriorating US fiscal outlook, analyzing the program solely through the trust fund lens means ignoring how it adds to federal deficits. As Dynan (2026) shows, Social Security, alongside Medicare, is projected to be a key driver of the US long-term fiscal imbalance.

For these reasons, we primarily use the unified-budget perspective when evaluating the program's finances.

Using SSA data, we estimate that the Treasury borrowed $1.3 trillion to cover the OASI trust fund's annual shortfalls between calendar years 2010 and 2025 and is projected to borrow an additional $2.7 trillion between 2026 and trust fund insolvency in 2032, for a total of approximately $4 trillion (Authors' calculations; Board of Trustees 2026).

Notably, these figures exclude interest costs on borrowing to finance those shortfalls. As we show in the Appendix, when accounting for such interest costs on a fiscal-year basis, the program's debt contribution is $1.5 trillion for fiscal years 2010–2025 and a projected $3.4 trillion for fiscal years 2026–2032, for a total of about $5 trillion.

Based on CBO projections, OASI's annual financing gaps are projected to account for a growing share of unified federal deficits, rising from about 15% of the total deficit in 2026 to 22% by 2032 (CBO 2026a). Although CBO's assumptions differ from those used by the Social Security Trustees (see Note 1), these estimates illustrate the program's growing role in the worsening of the US fiscal outlook. Notably, CBO projections assume Social Security will continue paying scheduled benefits after trust fund insolvency.

Under this assumption, total federal outlays rise from 23.3% of GDP in 2026 to 24.4% in 2036. Over the same period, Social Security spending increases from 5.2% of GDP to 5.9%, making it one of the three contributors to rising federal outlays, alongside Medicare (rising from 3.3% of GDP to 4.2%) and interest costs (from 3.3% to 4.6% of GDP). The overall increase in spending is partially offset by projected reductions in discretionary spending and other mandatory and health care programs as a share of GDP.

From a unified budget perspective, which excludes trust fund reserves and assumes the program pays scheduled benefits, Social Security's 75-year unfunded obligation (see Table 1) is about $32 trillion (Board of Trustees 2026).

According to the Treasury's Fiscal Year 2025 Financial Report, in addition to Social Security's unfunded obligation ($28 trillion at the time), Medicare's 75-year unfunded obligation amounted to $60.4 trillion. The rest of the noninterest budget was projected to run an $8.8 trillion surplus, bringing the total government unfunded obligation to $79.6 trillion, less than the combined total of Social Security and Medicare's unfunded obligations (Treasury 2026).

Social Security's infinite-horizon unfunded obligation, which extends beyond the 75-year window and accounts for the funding gap across all past and future cash flows, is $74 trillion (Board of Trustees 2026).

Trust fund accounting versus annual cash flows. Because the OASI trust fund is not projected to exhaust its intragovernmental IOUs until 2032, this date—often referred to as 'trust fund insolvency' (see Table 1)—tends to dominate Social Security policy debates. This is not without basis. Insolvency will trigger automatic benefit cuts under the current law, creating a statutory deadline. Politically, this legal deadline may compel congressional action, as lawmakers face pressure to enact reforms before cuts take effect, though we question the strength of this political forcing mechanism in the political economy section below.

As we argue above, trust fund accounting obscures the program's role in the federal government's deteriorating fiscal outlook, which has important policy implications for Social Security.

Focusing solely on trust fund solvency while ignoring the program's annual cash flows could lead to misguided reforms. If a reform aimed at restoring solvency relied on large initial surpluses (followed by deficits), those surpluses are unlikely to be used to pay down publicly held debt and increase national saving, as past experience suggests (Nataraj and Shoven 2004; Smetters 2004).

When the program later returns to cash-flow deficits, the redemption of accumulated IOUs will again require the Treasury to transfer funds to Social Security. Notably, the required amount will exceed the earlier surpluses because the Treasury must repay the trust fund with interest. In effect, taxpayers would first pay taxes in excess of benefit costs and later bear the burden of even larger Treasury transfers.

The Role of Benefit Design Decisions in Social Security's Financing Challenges

Social Security's primary source of revenue is payroll taxes collected from younger workers, while its largest expenditure is old-age benefits paid to seniors. As an intergenerational transfer system, its cash-flow balance depends critically on the ratio of workers to beneficiaries.

As life expectancy has risen and fertility declined, and as the program expanded benefits beyond retired workers to include their dependents and survivors, the ratio of covered workers to OASI beneficiaries fell from about 16 in 1950 to about 3 in 2025 (Board of Trustees 2026; SSA, n.d.-a), significantly straining the program's PAYG structure.

While demographic shifts have unquestionably been a key driver of the program's financing challenges, we argue that congressional choices regarding benefit design are another major reason for the program's spending growth in excess of dedicated revenues.

Earnings-related benefits. President Franklin D. Roosevelt (FDR) envisioned Social Security as a program that would provide poverty protection in old age. When signing the Social Security Act in 1935, he stated: ‘We can never insure one hundred percent of the population against one hundred percent of the hazards and vicissitudes of life, but we have tried to frame a law which will give some measure of protection to the average citizen and to his family against the loss of a job and against poverty-ridden old age’ (SSA n.d.-b, para. 3).

Similarly, the key architects of the original Social Security Act and its subsequent modifications viewed the program as a basic floor of protection upon which individuals would build through personal savings and employer plans (Altmeyer 1968; Brown 1972; Schieber and Shoven 1999).

To ensure broad political support, the program’s framers adopted a contributory social insurance model, under which eligibility requires covered earnings and payroll tax contributions. FDR explicitly acknowledged the political motive, noting that ‘With those taxes in there, no damn politician can ever scrap my Social Security program’ (Schlesinger 2003, p. 292). The logic was that payroll taxes would create the perception that benefits are an earned right and that participants receive only what they paid into the system. As we show in the following section, this was indeed only a perception rather than reality.

Furthermore, the decision to make benefits earnings-related was driven by a combination of economic and political considerations. It was intended to broaden support for the program among higher earners and incentivize work, as individuals who worked longer and contributed more would receive higher benefits in retirement (Schieber and Shoven 1999).

This earnings-related system has several important implications. First, many recipients receive benefits below the poverty line. According to SSA data, in 2024, roughly 28% of retired-worker beneficiaries received below $15,600 in annual benefits, a threshold slightly above the single-senior poverty line of $15,050 (SSA 2025; US Census Bureau 2025).

Second, for higher earners, benefits often exceed what poverty protection would require. As an earnings-related program, Social Security aims to replace a portion of beneficiaries' pre-retirement earnings. While lower earners receive a higher share of their pre-retirement earnings due to the progressive benefit formula, higher earners receive larger benefits in absolute terms.

In 2024, the average annual benefit was approximately $24,432, or about 1.6 times the poverty threshold, while 13.2% of beneficiaries received at least $39,600 annually—2.63 times the poverty threshold (SSA 2025; US Census Bureau 2025).

These comparisons use the single-senior poverty line as a benchmark, but 59% of Americans age 65+ live with a spouse or partner (US Administration for Community Living 2024). In 2024, the poverty threshold for a two-person household with a householder (the individual owning or renting the housing unit) age 65+ was about $18,980 per year. A senior couple who both received an average Social Security benefit would collect $48,864 annually—about 2.6 times their poverty threshold.

Furthermore, the largest share of Social Security benefits flows to middle- and upper-income retirees. Census Bureau research shows that in 2013, 63% of Social Security benefits were paid to individuals with incomes above the median for the elderly population. Moreover, the top two income deciles received roughly the same total benefits as the bottom four deciles combined (Bee and Mitchell 2017).

Another implication of earnings-related benefits is that individuals who rely least on Social Security receive the largest benefits. CBO analysis of Social Security wealth (the present value of expected future benefits) finds that it represents only 10% of total assets for families in the top income quintile, compared with approximately 50% for families in the bottom quintile and 44% for those in the second quintile (Ash and Karamcheva 2026). Yet under current law, lifetime high-earning retirees who claim benefits at age 70 in 2026 can receive annual Social Security benefits exceeding $62,000—roughly four times the poverty threshold for seniors (SSA n.d.-d).

Some argue that government retirement programs should also serve a consumption-smoothing function, rather than solely alleviate senior poverty (Barr and Diamond 2006). This design choice is a key driver of the program's imbalances. In this chapter, we demonstrate that a benefit structure more focused on poverty alleviation than earnings replacement would be much less expensive.

Early windfalls. While the political rhetoric behind payroll taxes and 'earned benefits' commensurate with what individuals paid into the system was effective at securing broad public support, this principle was violated from the program's outset.

In its early years, a favorable worker-to-beneficiary ratio enabled policymakers to grant substantial windfalls to the earliest cohorts. The 1939 Amendments allowed individuals with limited payroll tax contribution histories to receive generous, long-lasting benefits and introduced spousal and survivor benefits unrelated to individual wage records (Schieber and Shoven 1999). The 1950 Amendments compounded this further, raising the average Social Security benefit by nearly 80% (Schieber and Shoven 1999).

The magnitude of these windfalls was substantial. For example, among birth cohorts born before 1901, the ratio of the present value of lifetime OASI benefits to lifetime payroll tax contributions was approximately 12, discounted at the rate of return on OASI trust fund assets (Leimer 2007). Such high returns would have been unattainable through the private retirement savings mechanisms available at the time (Schieber and Shoven 1999).

These early windfalls not only departed from the purported principles of the system but also contributed to the program's long-term financing imbalance, ensuring that Social Security became a substantially worse deal for subsequent generations (Schieber and Shoven 1999). The benefits-to-taxes ratio fell below 1 for the 1932 cohort (those turning 65 in 1997), meaning that this cohort, and all subsequent cohorts, are projected to receive less in OASI benefits than they paid in taxes (Leimer 2007).

Meanwhile, current workers face a 10.6% OASI payroll tax rate, compared to the initial 2% rate paid by the earliest cohorts, who contributed far less than they ultimately received in benefits (SSA n.d.-c).

Wage indexing and overstated inflation adjustments. Beyond the outsized benefits granted to early cohorts, Congress further strained Social Security's finances by ensuring that benefits would increase in real terms over time.

As part of the 1977 Social Security Amendments, Congress introduced wage indexing of lifetime earnings in the calculation of initial benefits. Because wages tend to rise faster than prices, the wage indexing policy led to inflation-adjusted initial benefit levels increasing across successive retiree cohorts.

Cogan and Heil (2023) examine a counterfactual scenario in which Congress adopted price indexing of initial benefits (i.e., holding initial benefits constant in inflation-adjusted terms) and find that such an approach would have generated consistent cash-flow surpluses from the mid-1980s on, avoiding the deficits that emerged after 2010, and preserving long-term solvency.

Wage indexing of initial benefits has important policy implications. As discussed in the following section, this policy partially offsets the positive effects of economic growth on Social

Security's finances: increases in tax revenues driven by wage growth are followed by rising benefit obligations, as benefits are also tied to wages.

Once initial Social Security benefits are calculated, they are adjusted annually for inflation through cost-of-living adjustments (COLAs). Under current law, COLAs are based on the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), which reflects the price changes in the basket of goods and services purchased by about 32% of US households. CPI-W overstates the effects of the rise in the cost of living relative to the more representative Chained Consumer Price Index for All Urban Consumers (C-CPI-U), which covers 87% of the US population and, unlike CPI-W (and CPI-U), accounts for consumer behavior of substituting items with alternatives in response to price increases (Early 2023). Adopting C-CPI-U for COLAs would provide a more accurate measure of inflation and further moderate the growth in Social Security benefits.

Political Economy Constraints on Reform and the Implications of Delayed Structural Changes

Congress has been reluctant to adopt changes to address Social Security's financing gap. Political economy dynamics explain reform delay.

Political incentives and fiscal illusion. The tendency of democracies to run persistent budget deficits is grounded in political incentives. Government spending that delivers tangible benefits is popular among voters, whereas taxes impose direct and immediate costs on voters and are therefore politically unpopular (Buchanan and Wagner 1977). As financing government spending becomes increasingly difficult to sustain, politicians often engage in ‘fiscal illusion,’ a practice of obscuring the true cost of government spending (Buchanan 1967).

These dynamics are directly observable in the history of Social Security policymaking. The high worker-to-beneficiary ratio in the early years allowed Congress to expand benefits without commensurate payroll tax increases, effectively concealing the true cost of those expansions. While it was widely acknowledged that these unfunded expansions would ultimately burden future generations, policymakers of the time prioritized short-term political gains over intergenerational fairness.

Notably, both Edwin Witte, executive director of the Committee on Economic Security that developed the Social Security Act, and Arthur Altmeyer, the program’s first commissioner, opposed the benefit expansions explicitly on intergenerational fairness grounds (Schieber and Shoven 1999).

Later, in the 1970s, Congress adopted wage indexing despite warnings from a panel of Social Security experts and the availability of the more fiscally responsible alternative of price indexing. At the time, the panel questioned ‘the fairness and wisdom of now promising benefits at such a level that we must commit our sons and daughters to a higher tax rate than we ourselves are willing to pay’ (Cogan and Heil 2023, para. 9).

These historical examples help explain both continued benefit expansions and the postponement of Social Security reform. Closing the program’s funding gap requires either raising payroll taxes, reducing benefits, or some combination of the two—options that impose visible and politically unpopular burdens on voters.

Moreover, because Social Security's trust fund is not projected to exhaust its intragovernmental IOUs until 2032, it creates the misleading impression that the financing problem lies in the future, despite the fact that its annual imbalances have added to federal debt every year since 2010.

Even after the trust fund is exhausted, which under current law requires roughly 22% benefit cuts, it is plausible that lawmakers would amend the law or adopt workaround measures to continue paying scheduled benefits through general revenues and borrowing, rather than enact politically costly tax increases or benefit reductions.

Fiscal and economic consequences of debt-financed Social Security. Avoiding policy adjustments and relying on borrowing to pay scheduled benefits would have severe fiscal and economic consequences. CBO's baseline assumes that Social Security will continue paying scheduled benefits after trust fund insolvency, financed through additional borrowing (Penn Wharton Budget Model 2019b).

In its latest Budget and Economic Outlook, CBO analyzed an alternative scenario, consistent with current law, under which OASI benefits would be reduced by an average of 28% between 2033 and 2036.[3] Under that scenario, the federal deficit in 2036 would total $1.2 trillion instead of $2.1 trillion—a 43% reduction. Publicly held debt would rise to 112% of GDP instead of 120%. Put differently, choosing to borrow to sustain scheduled benefits rather than aligning benefit costs with available revenues would increase the 2036 deficit by roughly $0.9 trillion and debt by eight percentage points as a share of GDP (CBO 2026a).

The economic effects would also be significant. Lower benefit costs would raise GDP by 1% in 2036 relative to CBO's baseline. This reflects higher labor supply, as some individuals choose to work more; increased private investment, as some workers save more to offset lower benefits; and more capital available for private investment, driven by lower interest rates resulting from reduced deficits.

Importantly, these macroeconomic feedback effects would further improve Social Security's finances. Lower government debt boosts private investment, wages, and the payroll tax base, which, in turn, increases Social Security's revenues. For example, the Penn Wharton Budget Model (2018) projected that Social Security's annual cash-flow shortfall in 2048 would be 77% larger when accounting for the negative effects of rising debt than projected by the Social Security Trustees, who do not incorporate such feedback effects.

Limits of economic growth in addressing Social Security's financing problem. Policymakers sometimes point to stronger economic growth as a way to address Social Security's financing gap without resorting to politically difficult benefit or tax reforms (CRFB 2023; Republican Study Committee 2026). Higher economic growth raises wages and payroll tax revenues, which improve Social Security's near-term finances. Yet, because initial benefits are wage-indexed, higher wage growth also raises long-term benefit obligations, limiting the extent to which growth can meaningfully reduce the program's deficits.

Stronger wage growth also increases revenues from the taxation of benefits, as the tax thresholds that determine how much benefit income is subject to taxation are not indexed to wage growth or inflation. Nevertheless, benefit taxation is a small component of the program's finances, accounting for 4.7% of total tax revenues in 2025 (Board of Trustees 2026).

Using the Cato Institute's Social Security model (see Online Appendix), which assumes a baseline average real wage growth rate of 1.13%, we illustrate changes in the program's cash-flow balances as a percent of taxable payroll over the next 75 years (2025–2099) under alternative wage growth assumptions of 1.63% and 2.13%. While economic growth can be modeled directly, wages have constituted a declining share of national income over recent decades (US Bureau of Economic Analysis 2026). As such, wage growth serves as a more direct measure of how economic growth translates into changes in Social Security's finances.

We focus on annual cash-flow balances as the primary sustainability metric, since, as described above, they reveal the program's contribution to the worsening US fiscal outlook more clearly than trust fund solvency.

Figure 1 shows that even substantially higher real wage growth would not prevent persistent cash-flow deficits. Higher wage growth meaningfully improves the program's finances: by 2099, the deficit narrows from 4.85% of taxable payroll under the baseline to 3.65% under the 1.63% scenario and 2.63% under the 2.13% scenario. Yet under no scenario does the program approach cash-flow balance at any point over the 75-year projection horizon.

Figure 1 here

To achieve 75-year solvency through real wage growth alone, Cato's Social Security model projects that real wages would need to grow by 5% annually, about 340% higher than assumed under both the model's baseline and the Trustees' projections (Board of Trustees 2025, 2026). Under realistic economic growth paths, including those modeled in this chapter, Social Security would continue adding to federal debt each year.

The effects of inflation on Social Security's finances. We also examine the effects of inflation on Social Security's finances. Higher inflation leads to larger COLAs, which directly increase benefit outlays. Inflation also increases tax revenues through higher nominal wages and by causing more benefits to become subject to income taxation.

Moreover, we illustrate how a severe inflation episode, combined with a broader economic decline, could affect the program's finances. Specifically, we replicate the historical stagflation experience of 1973–1982, the period that largely prompted the 1977 and 1983 Amendments (Schieber and Shoven 1999), applied to the years 2032–2041.

Figure 2 shows the effects of higher inflation and a potential stagflation episode on Social Security's cash flows. We model two alternative average annual CPI-W growth rates—2.9% and 3.4% (the model's baseline is 2.4%). The stagflation scenario uses the actual year-by-year CPI-W and average wage index (AWI) growth rates from that period, combined with an assumed 1 percentage point annual decline in employment. After 2041, all assumptions revert to baseline.

Figure 2 here

Figure 2 illustrates that higher inflation leads to minor improvements in Social Security's cash flows. By 2099, the baseline deficit is 4.85% of taxable payroll, compared with 4.73% under the 2.9% CPI-W scenario and 4.6% under the 3.4% scenario. This reflects the timing dynamics between inflation's effects on revenues and benefits. Higher inflation raises taxable payroll immediately, while the resulting COLA increase is applied to benefits with approximately a one-year lag. Nevertheless, these improvements are negligible compared to what would be required to place the program on a fiscally sustainable path. Notably, according to Cato's Social Security model, no inflation path would achieve 75-year solvency.

Under the stagflation scenario between 2032 and 2041, cash-flow deficits deteriorate sharply, reaching about 5.6% of taxable payroll in 2041—more than 1.5 percentage points higher than the model's baseline for that year. The cumulative impact in nominal terms is also substantial:

the stagflation episode would increase Social Security's nominal cash-flow shortfall over the 2032–2041 period from approximately $5.8 trillion to $8.8 trillion—a roughly $3 trillion increase. After 2041, as the assumptions revert to the baseline, cash flows gradually converge with the baseline trajectory by the end of the projection period.

International Reform Lessons Under Fiscal and Economic Stress

Based on the latest CBO projections, US federal debt held by the public is 100% of GDP in 2026 and is projected to exceed its historical maximum of 106% in 2030 (CBO 2026a). Net interest on the public debt now exceeds defense spending and surpassed $1 trillion for the first time in fiscal year 2025 (CBO 2025).

As shown in earlier sections, Social Security is a significant contributor to this worsening US fiscal outlook: the OASI program ran a deficit of approximately $260 billion in 2025, roughly 15% of the total federal deficit that year (Authors' calculations; CBO 2026a). Although addressing Social Security's financial challenges is constrained by political disincentives, international experience suggests that fiscal or economic crises often serve as catalysts for politically difficult but necessary retirement reforms. In 2008, the Government Accountability Office (GAO) reviewed international entitlement reforms to identify lessons for Congress. The report found that nearly all OECD member countries enacted retirement reforms in the 1990s, 'with a clear trend toward reduced benefit promises' (GAO 2008, p. 9). As GAO notes, reforms often began in response to rising fiscal pressures and economic shocks (GAO 2008).

Below, we draw policy lessons for the United States from the experiences of Canada, Germany, New Zealand, and Sweden—all among the OECD countries that implemented reforms during the period analyzed by GAO.

While the predominant pattern across these cases was cost containment, these countries did not rely exclusively on benefit reductions: Canada also increased payroll taxes and permitted its pension fund to invest in equities, and Sweden introduced mandatory individual accounts. These cases also differ substantially in their local contexts, including labor markets, political institutions, demographic trajectories, and retirement systems. We do not argue that their experiences are directly replicable in the United States. Rather, we identify overarching patterns relevant to the current US environment. This includes the potential for crises to serve as catalysts for politically difficult reforms, the tendency to prioritize cost containment over tax increases, and the use of automatic stabilizers to limit the need for repeated political intervention. We examine these countries' retirement systems in greater detail in Boccia and Nachkebia (2025).

Fiscal and economic pressures as catalysts for retirement reform. Canada, Germany, New Zealand, and Sweden enacted politically sensitive retirement reforms when confronted with fiscal or economic pressures.

Canada reformed the Canada Pension Plan (CPP), a payroll-tax-financed PAYG program, after the 1995 CPP actuarial report projected that maintaining scheduled benefits would require gradually increasing payroll taxes from 5.4% in 1995 to 10.1% in 2016 and 14.2% by 2030 (Department of Finance Canada 1997). These projections coincided with mounting fiscal pressures, including a federal deficit of 5.1% of GDP and federal debt of 71% of GDP. Addressing the CPP's unsustainability thus became part of a broader effort to improve the worsening fiscal outlook (Speer 2017).

In Germany, demographic projections by the mid-1980s indicated that, in the long term, the Statutory Pension Insurance (*gesetzliche Rentenversicherung*, GRV) would require significant payroll tax hikes or benefit reductions. In response, the German government enacted reforms in the 1990s. These reforms proved insufficient as rising unemployment through the 1990s and an economic downturn in the early 2000s further strained GRV finances. These conditions led to additional reforms in 2004 and 2007 (GAO 2008).

Sweden's experience followed a similar pattern. By 1983, demographic pressures pushed its PAYG ATP program into deficits that were covered by transfers from its reserve fund. Without corrective action, projections showed the fund would be depleted between 2010 and 2025, depending on economic growth (Pension Working Group 1992). These pressures coincided with a severe recession in the early 1990s—the country's worst since the Great Depression—which drove government debt from 40% of GDP to 74% between 1990 and 1994 and pushed government spending to 76% of GDP by 1995. These developments led to an overhaul of Sweden's retirement system in 1998 (Lundberg 2020).

New Zealand likewise reformed its retirement system in response to fiscal and economic stress. Benefit expansions and population aging increased old-age spending from 3% of GDP in 1971–1972 to 7% by 1978–1979 (Preston 2008). This trend coincided with the oil shocks of the 1970s, when economic growth declined from 7.2% in 1974 to -2.6% by 1978, placing further pressure on government finances (Reddell and Sleeman 2008). This triggered a series of retirement reforms in the 1980s and 1990s, aimed at reducing old-age spending.

Reducing unsustainable benefits while limiting reliance on payroll tax increases. As the GAO report (2008) emphasizes, most OECD countries reformed their programs with a clear trend toward reducing benefit costs. This includes Germany, Sweden, and New Zealand.

In Germany, the 1992 reforms modified indexation rules to slow benefit growth and raised the normal retirement age from 63 to 65. Subsequent debates leading up to the 1999 reforms recognized that further payroll tax increases would be economically harmful, given already high labor costs. Policymakers instead focused on cost containment, including by raising women's retirement age to match men's, at 65.

Persisting demographic pressures and structural unemployment led to further reforms in the early 2000s. In 2004, Germany introduced an automatic stabilizer, called the 'sustainability factor,' that reduces benefit growth when the contributor-to-beneficiary ratio declines, and in 2007, it legislated a gradual increase in the retirement age from 65 to 67 (GAO 2008).

Similarly, Sweden avoided raising payroll taxes when implementing its 1998 reforms (Lundberg 2020). As part of the reform package, the notional defined contribution (NDC) Income Pension and mandatory individual accounts replaced the defined benefit (DB) ATP program, while a means-tested Guarantee Pension replaced a universal basic benefit. Because NDC systems still operate on a PAYG basis, they remain vulnerable to demographic pressures. To address this, Sweden implemented an automatic balancing mechanism in the Income Pension, which slows benefit growth when the system's liabilities exceed its assets. Sweden later strengthened this automatic framework by adding a second stabilizer in 2022 linking eligibility ages to life-expectancy increases (Norlin and Prytz 2023).

New Zealand likewise focused on cost containment in its 1980s and 1990s reforms. These included introducing an income test for the previously universal New Zealand Superannuation (NZS) benefit in 1985, eliminating tax preferences for private retirement saving in 1988, reducing NZS benefits in 1989, and gradually increasing the retirement age from 60 to 65 between 1992 and 2001. Although the income test was later repealed in 1998, the cumulative effect of these reforms was to reduce old-age program spending from 8% of GDP in 1980 to about 5% by the late 1990s (Preston 2008).

Canada is the only country among the four that relied on payroll tax increases. To avoid an eventual increase to 14.2%, policymakers front-loaded CPP payroll tax increases from 5.85% in 1997 to 9.9% in 2003. Beyond this revenue-increasing measure, the reform package slowed benefit growth, allowed CPP surpluses to be invested in non-governmental securities, and introduced an automatic balancing mechanism that slows benefit growth and raises payroll taxes if policymakers fail to reach agreement when long-term imbalances reemerge (Department of Finance Canada 1997).

Automatic stabilizers to depoliticize actuarial adjustments. Given the political difficulty of adopting retirement program changes, Canada, Germany, and Sweden have now built automatic stabilizers into their PAYG systems. These tools mitigate the effects of policy inertia by triggering regular, rule-based actuarial adjustments when policymakers are reluctant to act, effectively depoliticizing retirement policy (OECD 2021).

Germany and Sweden have adopted mechanisms that automatically slow benefit growth in response to demographic or financial pressures (GAO 2008). Canada’s CPP includes a similar safeguard: if long-term shortfalls arise and politicians fail to agree on a solution, an automatic mechanism will slow benefit growth and increase payroll taxes (Department of Finance Canada 1997).

Sweden further enhanced its automatic framework in 2022 by linking eligibility ages across all old-age programs to increases in life expectancy, ensuring the system adjusts continuously to demographic change (Norlin and Prytz 2023). Notably, one in four OECD countries has incorporated such a link into the nation’s old-age program (OECD 2023).

Lessons for the United States

These international experiences highlight a consistent pattern: retirement reforms were typically enacted when deteriorating fiscal or economic conditions coincided with projected actuarial imbalances or significant increases in old-age spending. In the United States, rising debt, Social Security's chronic cash-flow deficits, and adverse demographic trends increasingly resemble the conditions that triggered reforms abroad.

Other advanced economies responded to fiscal and demographic pressures by prioritizing benefit reductions over tax increases, adjusting retirement programs to account for worsening demographics, and adopting automatic stabilizers to mitigate the risks of political delay (GAO 2008).

Social Security's contribution to the accelerating growth in publicly held debt is driven by both benefit design and adverse demographic trends. As in many other OECD countries, reform in the United States should address both factors to reduce the program's cash-flow deficits. In this section, we outline specific policy options and evaluate their effects using the Cato Institute's Social Security model.

We further examine how tax increases could be structured to minimize economic distortions. We conclude by assessing two reform proposals considered by Congress: partially privatizing Social Security and establishing a debt-financed government investment fund. We do not conduct a holistic distributional analysis of these reform options, as the analysis that follows primarily aims to illustrate options for reducing Social Security's fiscal burden. Where relevant, however, we discuss their likely distributional effects qualitatively. Lastly, several limitations of the Cato Institute's Social Security model are worth noting before presenting the results (the full model methodology is in the Online Appendix).

The model covers only the OASI program and cannot be used to analyze the DI program. It also assumes every beneficiary household is a married couple filing jointly, which slightly affects projected benefit-taxation revenue and outlays, though the overall effect appears negligible.

Claiming age is fixed at 67, so the model does not capture whether people would retire earlier or later under different policies. Furthermore, because fully solving how the economy adjusts year by year to a policy change is computationally demanding, the model instead compares two long-run snapshots—before and after the reform—and assumes a smooth transition path between them, an approach developed by Mankiw and Weinzierl (2006). It is also worth noting that the model is calibrated to the 2025 Trustees report's assumptions, while most SSA figures cited elsewhere in this chapter draw on the 2026 report.

Transitioning to flat-benefit design. Social Security's earnings-related benefits design, which focuses on lifetime earnings replacement, results in benefits for many retirees that exceed what is necessary for poverty protection. Reorienting the program's benefit design toward old-age poverty alleviation is one of the options that can significantly reduce the program's fiscal burden.

An example of such a system is New Zealand's NZS, which offers flat benefits to all retirees who meet residency requirements, regardless of lifetime earnings (Te Ara Ahunga Ora Retirement Commission 2022). To avoid work disincentives associated with benefits entirely independent of work history, a Social Security flat benefit could be conditioned on years of covered employment. Below, we model a reform that replaces Social Security's current benefit formula with a flat benefit payable to individuals with 40 years of work, regardless of lifetime earnings. Eligibility requires at least 15 years of work, with benefits prorated for shorter careers.

Given the scope of this change, the reform would be phased in to avoid disrupting retirement planning for current and near-retirees. Individuals age 60+ in 2026 would not be affected by the reform. The phase-in begins in 2029, when the first affected cohort—those born in 1967—reaches age 62. The transition would gradually eliminate the 32% and 15% bend-point factors while increasing the 90% bend-point factor. The federal poverty line (FPL) of $15,650 in 2025 serves as the benchmark for calibrating the flat benefit during the transition (US Department of Health and Human Services 2025). Both the FPL and the first bend point ($1,226 in 2025) are projected forward to 2028, the final pre–phase-in year. The FPL projection is based on CBO's CPI-U growth assumptions, while the bend-point projection follows SSA's AWI (Board of Trustees 2025; CBO 2026a).

From 2029 through 2036 (the transition period), bend points grow at the same rate as the FPL, which is indexed to the CPI-U. This preserves the intended alignment and effectively introduces a form of price indexing of initial benefits during the transition. Beginning in 2029, the 90% factor increases by two percentage points annually until it reaches 102% in 2034. The 32% factor declines by four percentage points per year from 2029, reaching zero in 2036. The 15% factor declines by three percentage points per year from 2029, reaching zero in 2033. A worker's applicable bend point factors would be determined by the year they attain age 62 (the first year of eligibility), regardless of when they claim benefits. For example, a worker who turns 62 in 2032 is subject to the 2032 factors whether they claim at 62 or later.

By 2036, the reform would be fully phased in, with replacement factors of 102%, 0%, and 0%. At this point, the earnings-related formula would be replaced by a flat benefit calibrated to the FPL, meaning that past earnings would no longer play a role in benefit determination. All workers with 40 years of covered work would receive the full flat benefit regardless of their earnings history.

The full flat benefit in 2036 would equal 102% of the first bend point as projected to 2036. After the transition, this amount would be indexed to the chained CPI-U (C-CPI-U) rather than CPI-U. This would decouple the benefit from the FPL, while providing more accurate cost-of-living adjustments and preserving real benefit value over time.

The flat-benefit reform would significantly reduce Social Security spending as a share of GDP, with cost savings increasing over time. Under this reform, OASI spending would fall from 5.5% of GDP in 2035 under the model's baseline to 4.9%. By 2055, spending would decline from 5.7% of GDP to 3.03%, and by 2099 from 6.2% to 1.6%.

As Figure 3 shows, the reform would also substantially improve the program's cash flows. In 2042, the OASI program would record its first cash-flow surplus of 0.2% of taxable payroll, compared with a deficit of 3.55% under the baseline. Surpluses would continue to grow thereafter, reaching about 6.6% of taxable payroll by 2099, compared with a 4.9% deficit under the baseline. These increasing surpluses reflect the fact that the flat benefit would be indexed to inflation, while payroll tax revenues would grow with wages, which are projected to increase faster than prices.

Figure 3 here

As we note above, approximately 28% of retired-worker beneficiaries currently receive benefits below the poverty level (SSA 2025; US Census Bureau 2025). This reform would reduce that share among early cohorts, since it would raise the scheduled benefits of the lowest earners toward the poverty threshold. That reduction in the share of retirees with below-poverty benefits, however, would erode for future cohorts as the flat benefit gradually falls below the poverty threshold. To ensure the flat benefit remains at or above the federal poverty level, Congress could instead set it at a higher percentage of the FPL than 100%. Alternatively, after establishing its initial value relative to the FPL, policymakers could continue indexing the benefit to CPI-U rather than C-CPI-U.

Under the modeled reform, those with scheduled benefits at or above the poverty threshold, excluding individuals age 60+ in 2026, would see reductions from the outset. These lower old-age transfers would reduce consumption among asset-poor senior households, especially among earlier cohorts. Yet it should be noted that comparing the reform's effects relative to scheduled benefits ignores the fact that these benefits will be cut by 22% under current law by 2032. Arguably, the payable-benefits scenario, which assumes these cuts will occur, is the more appropriate baseline against which to measure any changes.

Moreover, while this change would reduce consumption among near-term retirees, these effects would be muted over the longer term. This is because the growing surpluses generated under this proposal would create room to gradually reduce the payroll tax from its current level, which could increase savings among workers. For example, the projected 2.8% of taxable payroll surplus in 2055 means an equivalent decrease in the payroll tax rate would be possible, easing the burden on younger workers and increasing their take-home pay, thus enabling greater private saving. This could be especially beneficial for lower earners, as it would enable them to save more for retirement in higher-return assets (Kotlikoff et al. 2007).

The Cato Social Security model is limited in its ability to conduct broader macroeconomic analysis, including the proposal's effects on work incentives. Yet the feature linking benefits to years of work would partially alleviate concerns about work incentives associated with lower benefits for the same payroll taxes. Moreover, as Shin and Smetters (2026) explain, while understanding the ultimate effects requires dedicated computation, a modest flat benefit could encourage more work and household savings to compensate for reduced benefits.

Beyond its broader economic effects, the flat-benefit reform also raises a political economy question. As mentioned above, giving higher earners higher benefits was motivated in part by the desire to build broad political support for the program (Schieber and Shoven 1999). Some have therefore argued that flat benefits would make Social Security resemble a welfare program, potentially weakening its political support and making it more vulnerable to future benefit reductions (Primus et al. 2026).

Whether such a reform would diminish political support and lower benefits over time is ultimately a speculative question. Nevertheless, two points are worth noting. First, transitioning Social Security to a flat-benefit structure would not transform it into a welfare program, as higher earners would continue to receive benefits. Rather, it would make the program's already progressive benefit formula more progressive. Second, even means-tested programs have expanded over the past few decades. For example, spending on Medicaid, the largest means-tested federal program, grew by about 89% as a share of GDP between fiscal years 2000 and 2025, compared with 29% for Social Security and 82% for Medicare (CBO 2026a).

Slowing benefit growth. If the current earnings-related structure were maintained, Congress could achieve substantial savings by slowing the growth in benefits. This could be done by indexing initial benefits to prices instead of wages and adopting a more accurate measure for COLAs.

Several approaches exist for price indexing initial benefits. Biggs et al. (2005) describe four methods: indexing lifetime earnings to prices rather than wages; indexing bend points to prices rather than wages; a combination of earnings and bend points indexing; and 'PIA Factor Indexing.'

We model the latter here because, according to Biggs et al. (2005), it results in the largest improvement in the program's finances among the four options, and it is the only method that keeps average initial benefit levels constant over time in real terms. Under this method, workers' lifetime earnings and the bend points continue to be indexed to wages, but the bend point factors—currently 90%, 32%, and 15%—are multiplied annually by the ratio of price growth to wage growth. A worker's applicable factors would be determined by the year they attain age 62. This option can be paired with adopting C-CPI-U for COLAs, ensuring more accurate inflation adjustments. Under this combined reform, C-CPI-U is also used to measure price growth in the initial benefit indexing formula.

Below, we present the effects of these combined options on Social Security's finances, assuming full implementation beginning in 2029. As Figure 4 illustrates, these combined changes would significantly reduce Social Security spending as a share of GDP. Spending would fall from 5.5% of GDP in 2035 under the baseline to 5.1%, from 5.7% to 3.8% in 2055, and from 6.2% to 1.7% by the end of the projection period in 2099. Social Security would begin running cash-flow surpluses in 2049, and by 2099, the program would record a surplus of 6.4% of taxable payroll, compared with a 4.9% deficit under the baseline. These widening surpluses again reflect that the program's spending would grow with inflation while its revenues would rise with wage growth.

Figure 4 here

Price indexing initial benefits would reduce scheduled benefits for future retiree cohorts. This would result in lower consumption among near-term retirees, especially those who lack assets that generate non-Social Security income. Moreover, because the PIA Factor Indexing method increasingly reduces Social Security's replacement rates over time, benefit reductions would be larger for later cohorts. Yet later cohorts would also face lower payroll taxes over their lifetimes, which would free up resources for greater private saving in higher-return assets. For example, by 2060, the payroll tax rate could be reduced by 1.6 percentage points. Furthermore, this policy change would guarantee that Social Security benefits maintain their purchasing power across retiree cohorts, and it would also mean that two individuals with the same earnings histories in real terms would not receive different benefits simply because they retired at different times. Economic growth would also become a stronger factor in improving the program's finances.

Although we model only two policy options in this subsection, lawmakers have additional tools to slow benefit growth. These include adjusting bend points or modifying bend point factors to reduce replacement rates for higher earners. For example, lawmakers could introduce an additional bend point with a lower replacement rate or directly lower the 32% and 15% factors applied to higher portions of earnings.

Policymakers could also consider incorporating an automatic balancing mechanism—similar to those adopted in other PAYG systems—to reduce reliance on political action for actuarial adjustments. A Social Security balancing mechanism, similar to that of Sweden's Income Pension, could automatically align program costs with its revenues by slowing benefit growth when financial pressures intensify. If projected revenues were insufficient to finance scheduled benefits, automatic adjustments, such as slower benefit indexation or lower bend points, could be triggered until long-term balance was restored.

Aligning Social Security eligibility ages with demographic trends. Another option for reducing Social Security's fiscal burden is to directly address the demographic shifts that have strained its finances by raising retirement ages. Once higher eligibility ages are phased in, they could be linked to gains in life expectancy, as in Sweden, allowing the system to adjust continuously.

Since Social Security's first benefit payment in 1940, life expectancy at age 65 increased by 6.5 years for men and 7.1 years for women (Board of Trustees 2026). Meanwhile, the fertility rate has fallen to a historic low (Board of Trustees 2026). Notably, Einav and Finkelstein (2026) find that the 2.4-year increase in average life expectancy at age 66 between 1993 and 2017 consisted entirely of additional healthy years, without the physical or cognitive limitations that typically emerge later in life. This suggests that older Americans are not only living longer but also remaining capable of working for longer.

Despite these shifts, the full retirement age (FRA) has increased by only two years since the program's inception, from 65 to 67. As a result, fewer workers now finance each retiree's benefits, while retirees receive benefits for longer periods on average. US policymakers could align Social Security with these demographic realities by raising the early eligibility age (62), the FRA (67), and the delayed claiming age (70).

We model the effects of increasing these thresholds by three years each for individuals reaching age 62 in 2029, followed by indexing all eligibility ages to life expectancy. For the life-expectancy link, we use an approach highlighted by the SSA that maintains a constant ratio of expected years in retirement (projected life expectancy at the FRA) to years of work (the FRA minus 20). The SSA estimates that maintaining this ratio would require increasing the FRA by one month every two years (SSA 2026). We apply the same adjustment to the early eligibility age and the delayed claiming ages.

As Figure 5 shows, this change would not close the program's cash-flow gap over the projection period, reinforcing our argument that demographic change alone does not explain Social Security's funding challenges. Yet raising retirement ages would still significantly reduce the program's share in federal borrowing. The cash-flow shortfall would decline from 3.9% of taxable payroll in 2055 under the baseline to 1.2%, and from 4.9% in 2099 to 1%. Under this scenario, Social Security spending would fall from 5.7% of GDP in 2055 under the baseline to 4.7%, and in 2099, from 6.2% to 4.6%.

Figure 5 here

A common concern with raising retirement ages is that gains in longevity have differed across income groups. For example, Einav and Finkelstein (2026) find that although individuals below the median income also experienced gains in healthy life expectancy, those gains were smaller than for individuals above the median, 2.0 years compared with 2.8 years.

A comprehensive assessment of the distributional effects across income groups is beyond the scope of this chapter. Yet several studies suggest that lower earners will not be disproportionately affected by increases in retirement ages because they are more likely to receive disability benefits, which are largely unaffected by changes to the FRA. This also means that some of the savings in the OASI program would be offset by higher DI spending. For example, Mermin and Steuerle (2006) modeled the effects of raising the early eligibility age to 65 and the FRA to 69 years and 8 months and found that the policy would reduce lifetime OASDI benefits least for individuals in the lowest earnings quintile, precisely because they are more likely to receive disability benefits. Similarly, CBO (2024) finds that increasing the FRA to 69 would reduce lifetime benefits, measured as a share of lifetime earnings, by the smallest amount for workers in the lowest earnings quintile.

Although lower earners may not be disproportionately affected by increases in retirement ages, they would still experience absolute reductions in benefits, which would constrain their retirement consumption. Pairing the eligibility age change with a flat-benefit reform that increases benefit levels for lower earners could partially offset those reductions.

Raising payroll tax revenue. Social Security's cash-flow shortfalls could also be addressed by raising payroll tax revenues. We examine the effects of increasing the payroll tax rate to a minimum level sufficient to restore Social Security's 75-year solvency, if the policy took effect in 2029. Although 75-year solvency is a flawed measure of sustainability, it provides a useful benchmark for the size of tax hikes required under this approach.

Using the Cato Institute's Social Security model, we estimate that achieving 75-year solvency of the OASI trust fund would require raising the combined payroll tax rate from 12.4% to 17.6% beginning in 2029 for all covered workers. Figure 6 shows that a broad-based payroll tax increase would initially produce a cash-flow surplus of 2.4% of taxable payroll in 2029. This would gradually turn into a 0.01% taxable payroll deficit by 2074. Deficits would persist until 2088, after which the program would return to surpluses, reaching a surplus of 0.4% of taxable payroll by 2099.

Figure 6 here

This payroll tax hike would increase labor costs, reduce workers' take-home pay, and could reduce savings and capital accumulation (Kotlikoff et al. 2007). It would also place most of the burden of fixing Social Security's finances on younger generations, who have a higher incidence of poverty and whose median net worth is substantially lower than that of seniors (Bee et al. 2025; Federal Reserve 2023), thereby exacerbating intergenerational inequities.

A second frequently proposed revenue-raising option is eliminating the maximum taxable earnings cap, set at $184,500 in 2026. Because the cap also determines the maximum earnings counted toward benefit calculations, removing it can also increase benefit costs if additional earnings are credited toward benefits. We model this approach in this chapter, although some proposals would eliminate the cap without increasing benefits. The elimination of the taxable earnings cap would have much more modest effects on the program's cash flows (Figure 6). This change would produce a large initial reduction in deficits, but its impact deteriorates thereafter, with the cash-flow balance eventually converging with the baseline trajectory.

These modest improvements in the program's finances would come with high economic costs. For affected workers, it would raise marginal tax rates on labor income by 12.4 percentage points, pushing combined marginal tax rates well above 60% in some states (Riedl 2024). Such high marginal rates can discourage work, innovation, and investment in human capital, reducing economic growth (Akcigit et al. 2021; Blandin 2021). If additional payroll tax revenues prove politically or fiscally unavoidable, a less distortionary alternative would be to broaden the payroll tax base by including nonwage forms of compensation (commonly referred to as fringe benefits) such as employer-provided health insurance. Excluding these benefits from taxable wage income creates incentives for employers to shift compensation toward this tax-advantaged option. Moreover, this tax preference primarily benefits higher earners with more comprehensive compensation packages (Michel 2024). Including fringe benefits in the payroll tax base would raise revenues, and, for some workers, increase benefits by expanding the earnings base used in benefit calculations.

As Figure 6 shows, taxing fringe benefits would improve Social Security's cash flows. In 2029, the cash-flow shortfall would fall to 0.7% of taxable payroll, compared with a 2.83% deficit in the baseline. Shortfalls would then gradually widen to 2.3% in 2055, compared with 3.9% of taxable payroll under the baseline. By 2099, the deficit would reach 3.6% of taxable payroll, compared with 4.9% under the baseline. The overall pattern is that these revenue-raising options produce initial jumps in cash flow (Figure 6). Because none of them address the projected growth in benefit spending, this initial improvement erodes over time in each case, as rising benefit costs outpace additional revenue growth. All three scenarios, however, show a modest recovery by the end of the projection period.

This pattern largely reflects underlying demographic dynamics. As the projected ratio of covered workers to beneficiaries falls steadily through the middle decades of the projection, benefit spending rises relative to the payroll tax base, eroding the initial gains from these revenue options. As the worker-to-beneficiary ratio stabilizes and modestly recovers from the mid-2080s, it produces a modest improvement in cash-flow balance seen in each scenario toward the end of the projection period (Board of Trustees 2025).

Partial privatization of Social Security. We conclude this section by addressing two additional proposals that have been considered by Congress. The first—partial privatization through individual accounts—was particularly popular in the early 2000s (Biggs 2025b), while the second—a debt-financed government investment fund—has emerged more recently as a bipartisan proposal aimed at fixing the program's finances without explicit tax increases or benefit reductions (Cassidy and Kaine 2025).

Partial privatization typically refers to diverting a portion of payroll taxes into individually owned defined contribution (DC) accounts. Under such a system, younger workers would gain greater control over a share of their payroll taxes and direct ownership of real economic assets, which could contribute to capital accumulation (Feldstein 2005). Over time, the program would also become more financially self-sustaining, as benefit obligations would be less dependent on inflows from new workers' payroll taxes and instead be pre-funded and backed by economic assets.

Yet transitioning to individual accounts without addressing existing shortfalls would significantly worsen Social Security's near-term finances and the broader US fiscal outlook.

Diverting payroll tax revenue would immediately widen imbalances, requiring even more borrowing than is projected today.

Because the impact depends heavily on reform specifics—including the share of payroll taxes diverted, the phase-in timeline, and adoption rates—we model three simplified scenarios and their effects on Social Security's cash flows over 30 years: a 20%, 30%, and 50% reduction in payroll tax revenues.

Under the baseline, Social Security faces a cumulative nominal cash-flow shortfall of approximately $21 trillion between 2025 and 2054. A 20% payroll tax revenue loss would increase this shortfall by $14 trillion, to $35 trillion. Losses of 30% and 50% would add $20 trillion and $33 trillion, bringing cumulative shortfalls to $41 trillion and $54 trillion, respectively. These additional shortfalls would translate directly into increased federal borrowing, plus associated interest costs. In short, while partial privatization may improve Social Security's long-run outlook and yield broader economic benefits, it would dramatically increase its cash deficits and federal debt over the next 30 years.

Debt-financed investment fund. Sens. Bill Cassidy (R-LA) and Tim Kaine (D-VA) recently proposed establishing a sovereign wealth fund (SWF) to address Social Security's funding gap (Cassidy 2025). SWFs are government entities that invest with the goals of capital accumulation for future generations, reducing volatility in government revenues, making strategic investments in domestic or foreign firms, or some combination of all three (International Forum of Sovereign Wealth Funds n.d.).

SWFs are, by their nature, vulnerable to political influence and have a varied track record in this dimension. Bernstein et al. (2013) find that greater involvement of political leaders is associated with SWFs investing in overvalued assets and subsequently underperforming. Notably, this association holds regardless of a fund’s stated objective. Both strategic funds (e.g., those pursuing domestic industrial development) and non-strategic funds (e.g., pension funds aiming to maximize returns) tend to underperform when political involvement is high.

The Cassidy-Kaine proposal, however, raises questions beyond political risks. Unlike major SWFs around the world, like Norway’s Government Pension Fund Global, which was funded through surplus oil revenues, this plan would be financed through borrowing.

As Biggs (2025a) notes, this proposal more resembles a ‘pension obligation bond,’ a strategy used by some underfunded state pensions in the United States in which governments borrow funds to invest in higher-yielding assets in the hope that investment returns exceed borrowing costs. Such strategies carry substantial risk: if projected returns fail to materialize, taxpayers will bear the burden (Biggs 2025a).

Specifically, Cassidy and Kaine propose borrowing $1.5 trillion to create an investment fund separate from the Social Security trust funds, investing primarily in equities and other high-return assets. The fund would accumulate returns over 75 years, with the Treasury financing Social Security’s $32-trillion funding gap over that period. Under the plan’s assumed nominal return of 8.9% (or a 6.5% real return after adjusting for the Social Security Trustees’ projected inflation rate of 2.4%), the accumulated assets would be used to repay both the initial $1.5 trillion investment and the $32 trillion in additional borrowing required to cover the 75-year funding gap (Cassidy and Kaine 2025).

A Monte Carlo analysis by Chen et al. (2026), based on 10,000 simulations, finds that even under the plan’s own return assumptions, it would fully repay all borrowing only 36 out of 100 times—working only at the 64th percentile of simulated outcomes.[4]

Yet the authors argue that the assumed 6.5% real return, which is based on historical equity performance, is optimistic and ran simulations based on a more realistic 4% real return derived from the Gordon Growth Model. Under this scenario, the investment fund would only repay 19% of total borrowing at the median outcome and repay fully only at the 83rd percentile, succeeding in just 17 out of 100 scenarios.

Finally, incorporating macroeconomic effects of the additional borrowing—higher interest rates and lower GDP growth reducing equity returns—yields a projected real return of 3.5% (Chen et al. 2026). Under this scenario, the Cassidy-Kaine investment fund offsets 21% or less of total borrowing in 95 out of 100 simulated outcomes.

Conclusion

Social Security's cash-flow deficits are worsening federal budget deficits each year and amount to $32 trillion in unfunded obligations over the next 75 years. This chapter argues that the program's unsustainable benefit design, not just demographic pressures, drives its spending growth and rising contribution to federal debt. Earnings-related benefits, windfalls to early retiree cohorts, real benefit growth over time, and outdated inflation adjustments interact with population aging to generate chronic cash deficits that add directly to publicly held debt.

The path of least political resistance, maintaining current benefit levels through additional borrowing, would be the economically costliest response. Such an approach would accelerate debt accumulation, raise interest costs, and reduce economic growth, undermining the program's revenue base. Neither faster economic growth nor higher inflation can, by themselves, close Social Security's funding gap under any realistic scenario. The implication is clear: restoring Social Security's long-term solvency will require structural reforms to the program's benefit design, financing, or both. Delaying those reforms will only increase the economic and fiscal costs of adjustment.

International experience demonstrates that retirement program reforms that are typically constrained by political economy forces become feasible during crises. Other advanced economies facing similar demographic and fiscal pressures have enacted reforms that reduced benefits, raised taxes, adjusted eligibility conditions to reflect gains in life expectancy, and introduced automatic stabilizers to limit reliance on repeated political intervention.

International case studies and Cato modeling suggest that policy options such as converging benefits toward anti-poverty levels, price-indexing initial benefits, and raising retirement ages in line with longevity gains could place Social Security and the broader federal budget on a sounder long-term trajectory by reducing excess benefit growth and adjusting eligibility to account for demographic aging.

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Appendix: Estimating Social Security's Contribution to Federal Deficits and Associated Interest Costs

Throughout this chapter, Social Security's contribution to annual federal deficits is measured using a cash-flow metric—the difference between annual tax revenues and spending—drawn from Table IV.B1 of the 2026 Social Security Trustees report (Board of Trustees 2026).

This metric understates the program's full deficit contribution because it includes intragovernmental transfers. CBO (2026a, Table 1–4) calculates the combined OASDI program's deficit contribution by excluding all intragovernmental transactions, including trust fund interest, payroll taxes paid by the federal government on behalf of its employees, and administrative expenses. Because we rely on SSA data throughout the chapter for consistency with our model, replicating CBO's methodology exactly is not possible. SSA does not isolate the federal employer share of payroll taxes. We estimate this share using CBO data and apply it to SSA figures.

Specifically, we use CBO's annual Baseline Projections for Social Security Trust Funds documents, published each year since 2007, which break out the components of trust fund finances in detail, allowing us to estimate the payroll taxes paid by the federal government (CBO n.d.). We then pair these estimated shares with annual payroll tax collection figures from SSA.

We also exclude other intragovernmental transactions such as administrative expenses and railroad program transfers. For consistency with CBO data, we draw on OASI trust fund tables reported on a fiscal-year basis (rather than the calendar-year basis used elsewhere in the chapter) from the 2015, 2020, 2025, and 2026 Trustees Reports.

To provide a fuller picture of the program's fiscal impact, we estimate the cumulative interest generated by these deficit contributions. When OASI's revenues fall short of its outlays, the federal government must borrow from the public to cover the gap. Each year's cash-flow deficit adds to the publicly held debt, and that added debt accrues interest in subsequent years. The interest cost component of OASI's contribution to the federal deficit in a given year reflects the financing cost of all debt the program has added to the publicly held debt stock since 2010.

Each year, OASI-attributable debt grows by two amounts: the new deficit incurred during that year, and the interest accrued on the OASI-attributable debt at the end of the previous year. The interest itself is added to the principal, so each year's interest is calculated on a base that includes all prior years' accumulated interest:

$$(1)\ D_x = D_{x-1} + CF_x + I_x$$

where D_x= cumulative OASI-attributable debt at the end of year x, CF_x = cash-flow deficit in year x, and I_x = interest accrued in year x. The interest accrued in year x equals the debt at the end of year x-1 multiplied by the effective interest rate in year x:

$$(2)\ I_x = D_{x-1} \times r_x$$

where r_x is CBO's average interest rate on federal debt, defined as net interest payments in the current fiscal year divided by debt held by the public at the end of the previous fiscal year. CBO publishes these interest rate series in its Long-Term Budget Outlook (CBO 2026b).

Table A.1 summarizes the results. In 2025, OASI's cash-flow deficit was $245.2 billion. Once all intragovernmental transfers are excluded, this figure rises to $254.9 billion. Adding $42.4 billion in interest accrued on past cash-flow deficits brings OASI's total annual contribution to federal debt to $297.3 billion that year. Cumulatively, these annual contributions total $1.5 trillion over fiscal years 2010 through 2025, with an additional $3.4 trillion projected between 2026 and 2032. In total, the OASI trust fund is projected to add approximately $5 trillion to federal debt between 2010 and 2032.

Table A.1 here

Notes

[1] Both the CBO and the Social Security Board of Trustees produce long-term Social Security projections, but their estimates differ because of varying assumptions and modeling approaches. CBO's projections generally show a larger actuarial imbalance, largely because the agency assumes lower fertility rates, longer life expectancies, a smaller payroll tax base, lower long-term interest rates, and a slower nominal GDP growth rate (CBO 2018; Huston 2023). We rely on the Social Security trustees for baseline program projections, such as cash-flow shortfalls, the insolvency date, and benefit reductions under current law. The Cato Institute Social Security model is calibrated to the Trustees' assumptions. We rely on CBO projections for Social Security's impact on unified budget deficits. Sources are specified where relevant. When presenting the model results, the term 'Social Security' refers to the OASI program.

[2] The model's methodology, assumptions, and limitations are documented in the Online Appendix.

[3] These are the required benefit cuts under CBO's projections. Note that CBO's Social Security projections differ from those of the SSA; see Note 1.

[4] Note that Chen et al. (2026) rely on the $25.1 trillion unfunded obligation figure from the 2025 Trustees Report for the combined OASDI program, measured from the trust fund perspective. The corresponding figure from the 2026 Trustees Report is $29 trillion on a trust fund basis and $32 trillion on a unified budget basis, as used elsewhere in this chapter.

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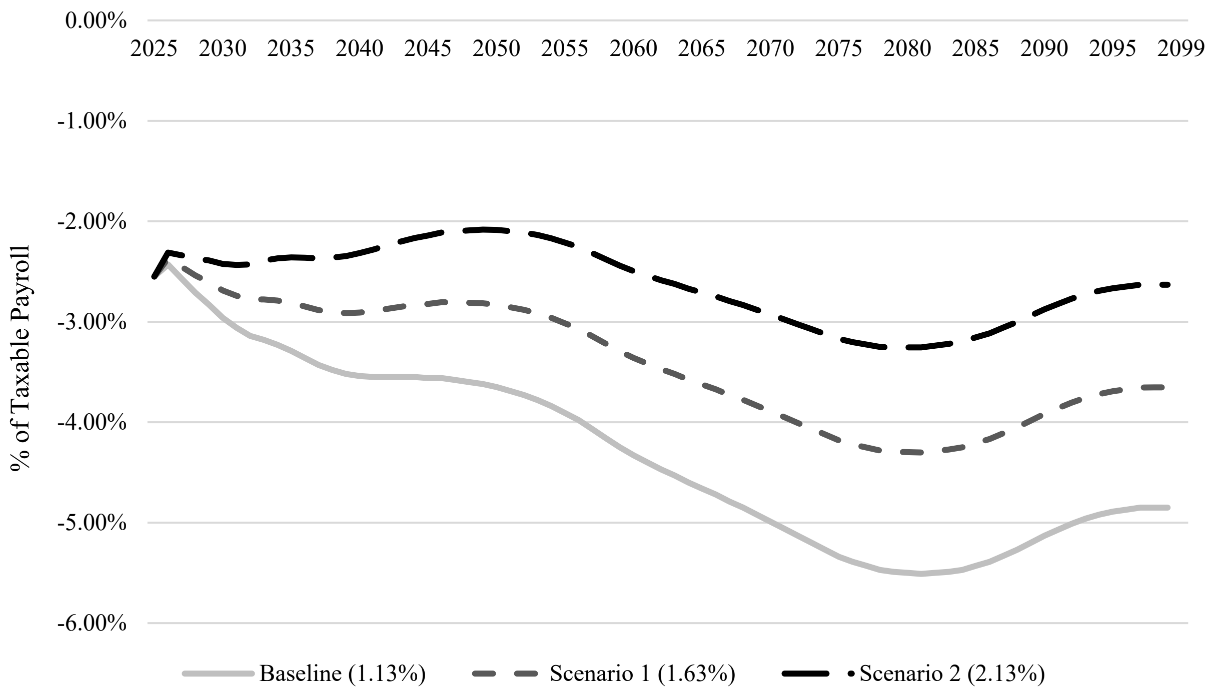
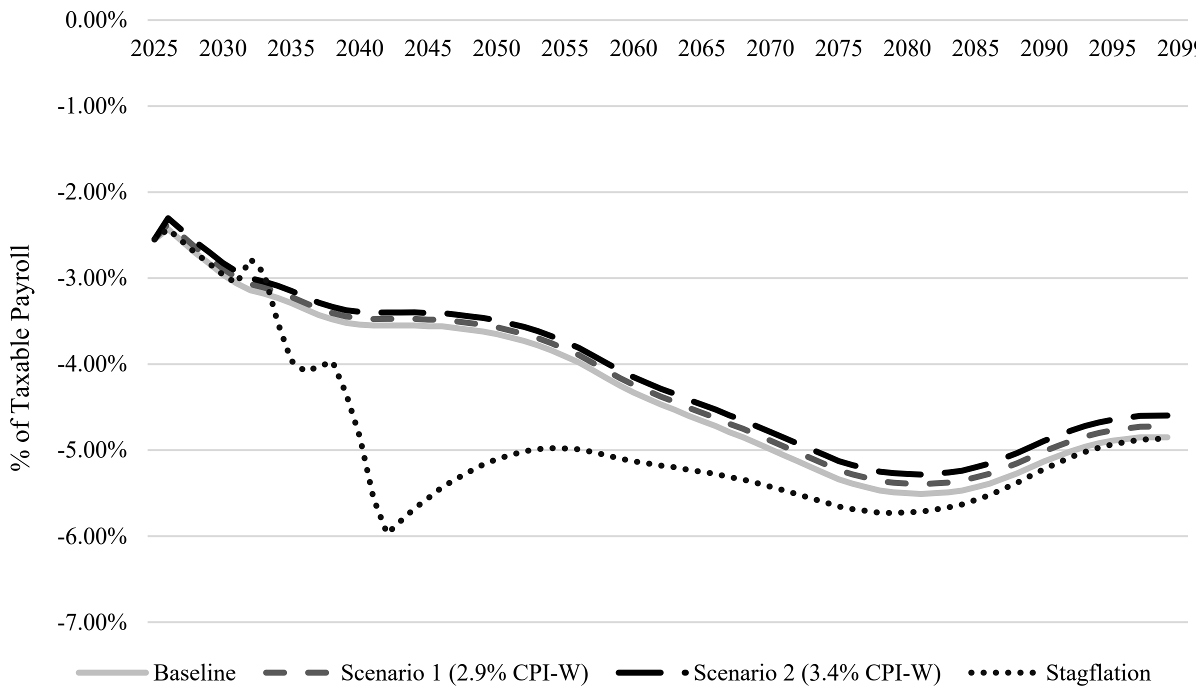
Figure 1. Social Security Cash-Flow Balance Under Alternative Real Wage Growth Assumptions, 2025–2099



Notes: ‘Social Security’ refers to the Old-Age and Survivors Insurance (OASI) program. Baseline assumes 1.13% average real wage growth. Alternative scenarios assume 1.63% and 2.13% real wage growth.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

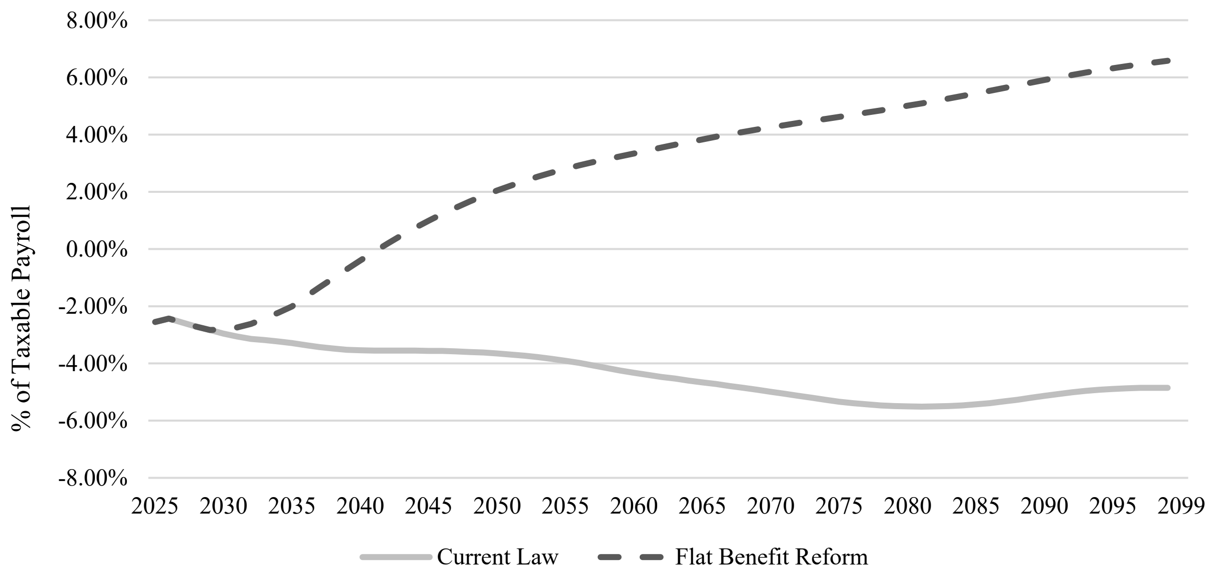
Figure 2. Social Security Cash-Flow Balance Under Alternative Inflation and Stagflation Scenarios, 2025–2099



Notes: 'Social Security' refers to the OASI program. Baseline assumes 2.4% average annual CPI-W growth. Alternative inflation scenarios assume 2.9% and 3.4% CPI-W growth. The stagflation scenario replicates the historical CPI-W and AWI trajectories from 1973–1982, applied to the period 2032–2041, combined with an assumed 1 percentage point annual decline in employment over that period.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

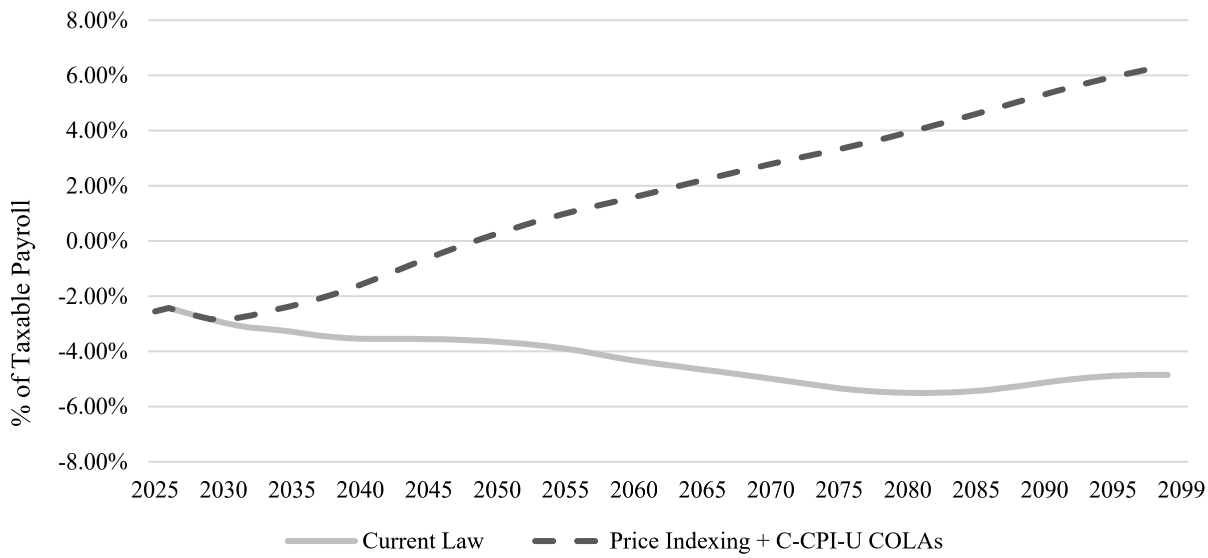
Figure 3. Social Security Cash-Flow Balance: Current Law Baseline vs. Flat Benefit Reform, 2025–2099



Notes: 'Social Security' refers to the OASI program. Current law baseline is based on the program's existing formula. The flat benefit reform replaces the earnings-related benefit formula with a flat benefit conditioned on years of covered employment, phased in beginning in 2029.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

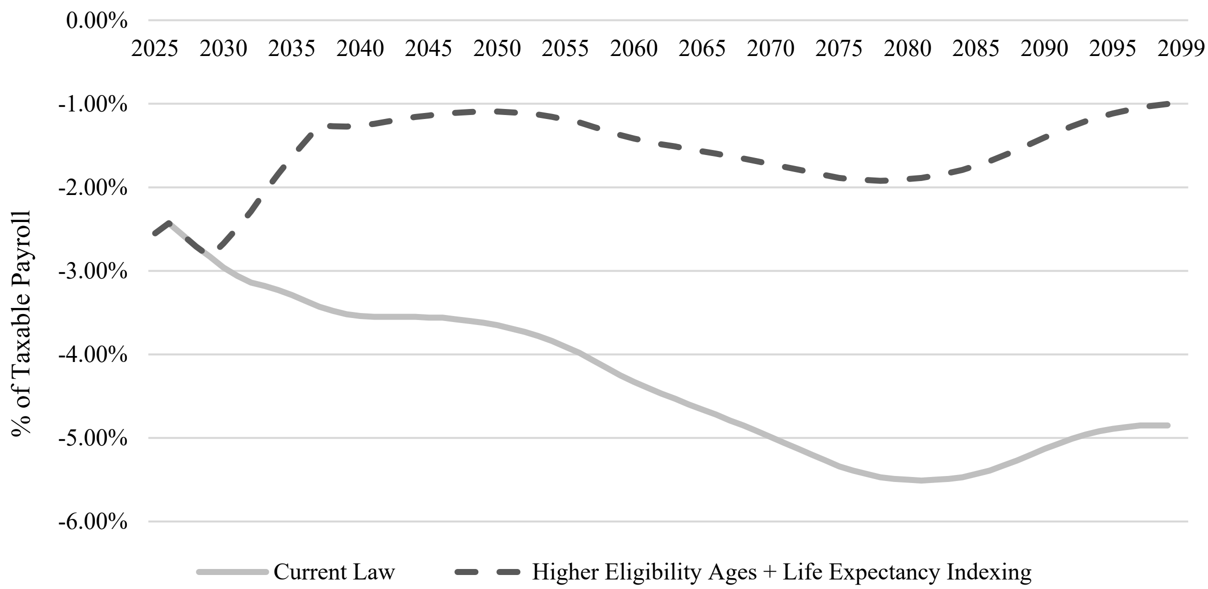
Figure 4. Social Security Cash-Flow Balance: Current Law Baseline versus Price Indexing of Initial Benefits and C-CPI-U COLAs, 2025–2099



Notes: 'Social Security' refers to the OASI program. Current law baseline assumes wage-indexed initial benefits and CPI-W cost-of-living adjustments (COLAs). This change combines price indexing of initial benefits with adoption of the Chained Consumer Price Index for Urban Consumers (C-CPI-U) as the COLA measure. Both reforms assume full implementation beginning in 2029.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

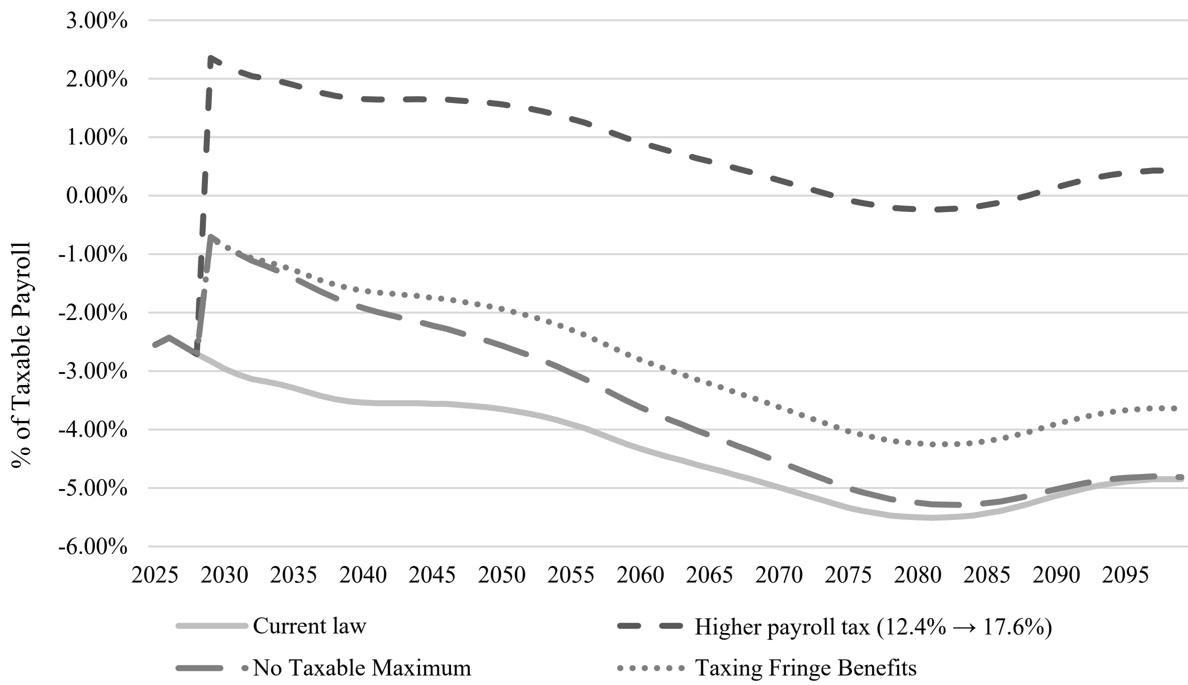
Figure 5. Social Security Cash-Flow Balance: Current Law Baseline versus Higher Eligibility Ages + Life Expectancy Indexing, 2025–2099



Notes: 'Social Security' refers to the OASI program. This change raises each eligibility threshold by three years for individuals reaching age 62 in 2029. It then indexes all eligibility ages to life expectancy using an approach that maintains a constant ratio of expected retirement years to working years.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

Figure 6. Social Security Cash-Flow Balance Under Alternative Revenue-Raising Options, 2025–2099



Notes: 'Higher Payroll Tax' reflects an increase in the combined payroll tax rate from 12.4% to 17.6%. 'No Taxable Maximum' reflects the elimination of the maximum taxable earnings cap. 'Fringe Benefits Included' reflects the expansion of the payroll tax base to include non-wage compensation such as employer-provided health insurance. All reforms are assumed to take effect in 2029.

Source: Calculations by Krit Chanwong using the Cato Institute Social Security model.

Table 1. Three Metrics for Analyzing Social Security's Finances

Metric	Definition
Cash-flow balance	The annual difference between the program's total expenditures and its tax revenues (payroll taxes and the taxation of benefits), excluding interest on accumulated trust fund reserves.
Solvency	The OASI program is solvent over any period during which its trust fund holds positive asset reserves.
Unfunded obligation	The present value of the difference between projected spending and projected tax revenues. Unlike the Trustees' standard measure, we exclude starting trust fund assets to better reflect the program's impact on the unified federal budget. An infinite-horizon unfunded obligation captures the funding gap in perpetuity across all past and future cash flows.

Sources: Huston (2023); Board of Trustees (2026).

Table A.1. OASI Contribution to Debt, Fiscal Years 2010–2032

Fiscal Year	Cash-Flow Deficit	Cash-Flow Deficit (excl. Intragovernmental Transfers)	Annual Debt Contribution (incl. Interest Costs)	Cumulative OASI-Attributable Debt
2010	6.8	12.2	12.2	12.2
2011	14.1	19.2	19.5	31.8
2012	10.9	17.1	17.8	49.5
2013	31.1	37.5	38.4	88.0
2014	38.7	44.9	46.6	134.5
2015	39.7	45.6	47.9	182.5
2016	59.1	65.9	69.3	251.7
2017	61.5	68.1	72.8	324.5
2018	100.7	107.6	114.8	439.3
2019	76.3	82.9	93.4	532.7
2020	69.1	76.8	87.8	620.4
2021	126	134.4	144.8	765.2
2022	97.3	106.0	122.3	887.5
2023	113.3	122.2	146.3	1,033.8
2024	154.4	163.4	198.0	1,231.9
2025	245.2	254.9	297.3	1,529.1
2026	287.4	298.3	350.9	1,880.0
2027	339.2	350.8	415.6	2,295.7
2028	349.2	361.8	444.0	2,739.7
2029	374.8	387.8	488.4	3,228.1
2030	396.3	410.1	531.4	3,759.5
2031	419.2	432.7	577.2	4,336.7
2032	443.1	457.2	627.6	4,964.3

Notes: All figures are in billions of nominal dollars. The cash-flow deficit (2nd column) equals scheduled benefit payments minus the sum of payroll tax revenues and revenues from the taxation of benefits, excluding trust fund interest income. The adjusted cash-flow deficit (3rd column) additionally excludes intragovernmental transfers: the federal employer share of payroll taxes, administrative expenses, and railroad retirement transfers. The federal employer payroll tax share is estimated using CBO's annual Baseline Projections for Social Security Trust Funds and applied to the Trustees' data. The annual debt contribution (4th column) equals the adjusted cash-flow deficit plus that year's accrued interest cost with interest accruing at CBO's projected average effective federal interest rate. Cumulative OASI-attributable debt (5th column) is the running total of annual debt contributions since 2010. The OASI trust fund is projected to be depleted in 2032.

Sources: Authors' calculations; Board of Trustees (2015, 2020, 2025, 2026); CBO (n.d.); CBO (2026b).

Online Appendix: The Cato Institute's Overlapping Generations Model for Social Security Reform

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Introduction

The aim of this model is to provide the public with a computable overlapping generations (OLG) model that can score most Social Security reforms without using significant computing power. This model focuses solely on the Old-Age and Survivors Insurance (OASI) program and cannot be used to analyze the Disability Insurance (DI) program.

The model builds on the structure of the Penn-Wharton Budget Model's (PWBM) OLG (Penn Wharton Budget Model 2019a), while making several important changes.

First, unlike the PWBM's OLG, this model allows for the analysis of policies that change dependent and survivor benefits. Second, it explicitly connects with Social Security trust fund rates and models the taxation of benefits. Finally, unlike the PWBM model, the model does not solve the full transition path due to computing limitations. Instead, it uses a back-of-the-envelope methodology from Mankiw and Weinzierl (2006) to approximate transition dynamics between steady states.

Production

We use a Cobb-Douglas production function, omitting the technology factor:

$$(1)\ Y = K^{\alpha} L^{1-\alpha}$$

where K is aggregate capital, L is aggregate labor in efficiency units, and $\alpha = 0.36$ is the capital share. Firms are competitive and hire factors up to their marginal products:

$$(2)\ w = (1 - \alpha)\left(\frac{K}{L}\right)^{\alpha}, \quad r_K = \alpha\left(\frac{L}{K}\right)^{1-\alpha}$$

Income decomposition. Households hold a single asset $\boldsymbol{a_j}$. The composition of the economy's asset pool determines how each household's savings map into different income streams. Define the portfolio shares:

$$(3)\ \psi_{cap} = \frac{K}{(K + D)}, \quad \psi_{debt} = \frac{D}{(K + D)}$$

where D is government debt. A fraction ψ_{cap} of each household's assets is implicitly invested in productive capital, and ψ_{debt} in government bonds. There is no portfolio choice—all households hold the same mix.

The capital share is further split between the corporate sector ($\zeta_{corp} = 0.55$) and the pass-through sector ($\zeta_{pass} = 0.45$). Both sectors earn the net-of-depreciation return $\pi = r_K - \delta$, but face different tax treatment. Combined with labor income $y_{k,j}^{lab} = w \cdot z_{k,j} \cdot n_{k,j}$ for spouse k at age j, this yields four income flows:

$$(4)\ y_{k,j}^{lab} = w \cdot z_{k,j} \cdot n_{k,j}$$

$$(5)\ y_j^{corp} = \pi \cdot \zeta_{corp} \cdot \psi_{cap} \cdot a_j$$

$$(6)\ y_j^{pass} = \pi \cdot \zeta_{pass} \cdot \psi_{cap} \cdot a_j$$

$$(7)\ y_j^{debt} = r_G \cdot \psi_{debt} \cdot a_j$$

where $r_G = 0.03$ is the exogenous government bond rate and $\delta = 0.06$ is the depreciation rate.

Government sector. The government receives revenue from income, payroll, and corporate taxes. It spends on Social Security outlays and residual government consumption. Like the closed version of the Penn-Wharton Budget Model, the government balances its budget by raising extra revenue, the source of which is undetermined. Government debt evolves as:

$$(8)\ D_{t+1} = D_t(1 + r_t^{nom}) + G_t + S_t - T_t$$

where T_t is total tax revenue, S_t is Social Security outlays, G_t is non-Social Security government spending, and $r_t^{nom} = (1 + r_G)(1 + g_{\pi,t}) - 1$.

Taxation

The tax function τ_j in this model mirrors the structure of the US federal tax code. Total taxes paid by a household at age j consist of three components:

$$(9)\ \tau_j = T_j^{ord} + T_j^{pref} + T_j^{payroll}$$

One limitation of the model is the assumption that all beneficiary households are married couples filing jointly. This may underestimate revenues from benefit taxation, since the thresholds for taxing Social Security benefits are higher for joint filers than for single filers. This assumption may also overestimate Social Security outlays by increasing the number of households receiving some form of auxiliary benefit. That said, both effects appear negligible in projections.

Projected outlays track closely with SSA projections, with a mean absolute error of 0.36 percentage points of taxable payroll. Similarly, projected revenues from benefit taxation differ from SSA figures by a mean absolute error of 0.25 percentage points of taxable payroll.

Income classification. Each income source is assigned an inclusion rate that determines what fraction enters the taxable base. These ratios approximate the standard deduction. Corporate equity income is split between ordinary income (dividends taxed at ordinary rates) and preferential income (long-term capital gains and qualified dividends):

Income Source	Ordinary Inclusion (θ^{ORD})	Preferential Inclusion (θ^{PREf})
Labor income	0.95	—
Corporate equity	0.60	0.40
Pass-through	1.00	—
Bond interest	1.00	—
Social Security	Formula	—

Social Security benefit taxation. The taxable portion of Social Security benefits is determined by the modified adjusted gross income (MAGI) test:

$$(10)\ MAGI_j = y_j^{other} + 0.5 \cdot b_j^{SS}$$

where y_j^{other} is all non-Social-Security ordinary income and b_j^{SS} is total Social Security benefits. The taxable amount is:

$$(11)\quad b_j^{SS,tax} = \begin{cases} 0 & \text{if } MAGI_j \leq \$32{,}000 \\ \min\left(0.50 \cdot b_j^{SS}, 0.50 \cdot \left(MAGI_j - \$32{,}000\right)\right) & \text{if } \$32{,}000 < MAGI_j \leq \$44{,}000 \\ \min\left(b_j^{SS,50\%} + 0.85 \cdot \left(MAGI_j - \$44{,}000\right), 0.85 \cdot b_j^{SS}\right) & \text{if } MAGI_j > \$44{,}000 \end{cases}$$

where $b_j^{SS,50\%}$ denotes the tier-1 taxable amount. The thresholds \$32,000 and \$44,000 are the married-filing-jointly thresholds. These thresholds are not indexed to inflation or wage growth.

The taxable amount is further decomposed into the OASI trust fund component (the first 50% tier) and the Medicare Hospital Insurance (HI) trust fund component (the remainder up to the 85% tier), since the resulting tax revenues are credited to different trust funds.

Ordinary income tax. Total ordinary income for a household at age ***j*** is:

$$(12)\ y_j^{ord} = \theta_{lab}^{ORD} \cdot \left(y_{1,j}^{lab} + y_{2,j}^{lab}\right) + \theta_{corp}^{ORD} \cdot y_j^{corp} + \theta_{pass}^{ORD} \cdot y_j^{pass} + y_j^{debt} + b_j^{SS,tax}$$

This is taxed through a progressive bracket schedule. For married-filing-jointly households:

Bracket Floor	Marginal Rate
\$0	10%

\$23,850	12%
\$95,950	22%
\$206,700	24%
\$394,600	32%
\$501,050	35%
\$751,600	37%

Survivors (widows/widowers) file as single filers and face narrower brackets with lower thresholds. The ordinary income tax is computed as:

$$(13)\ T_j^{ord} = \sum_i^T r_i \cdot max\left(0, min\left(y_j^{ord}, b_{i+1}\right) - b_i\right)$$

where r_i is the marginal rate and b_i is the floor of bracket i.

Preferential income tax. The preferential portion of corporate equity income ($\boldsymbol{\theta_{corp}^{PREF}} \cdot \boldsymbol{y_j^{corp}}$) is taxed at lower rates:

Bracket Floor (MFJ)	Rate
\$0	0%
\$96,700	15%
\$600,050	20%

Payroll tax. Each spouse's labor income is subject to a payroll tax up to the taxable maximum:

$$(14)\ T_j^{payroll} = \tau_p \cdot min\left(y_{1,j}^{lab}, \bar{y}\right) + \tau_p \cdot min\left(y_{2,j}^{lab}, \bar{y}\right)$$

where $\tau_p = 0.106$ is the combined employer-employee OASI rate and $\bar{y} = \$176{,}100$ is the taxable earnings cap. The cap is indexed to average wage growth in the projection. Note that this rate covers only the OASI portion; the HI (Medicare) component is handled separately through the benefit taxation channel.

Corporate income tax. On the production side, corporate profits are taxed at a statutory rate of $\boldsymbol{\tau_c = 0.21}$. This tax does not enter the household optimization directly but affects the general equilibrium through the cost of capital and the government budget constraint.

Social Security

Average indexed monthly earnings. Social Security benefits are computed from each worker's average indexed monthly earnings (AIME). For each spouse $\boldsymbol{k}$, the model records annual earnings $\boldsymbol{e_{k,j} = w \cdot z_{k,j} \cdot n_{k,j}}$ over the working life, subject to the taxable maximum. Earnings prior to age 60 are indexed to economy-wide wage growth:

$$(15)\ \boldsymbol{\tilde{e}_{k,j}} = \begin{cases} \boldsymbol{\min\left(e_{k,j} \cdot (1+g_w)^{60-j}, \bar{y}\right)} & \textbf{if } \boldsymbol{j < 60} \\ \boldsymbol{\min\left(e_{k,j}, \bar{y}\right)} & \textbf{if } \boldsymbol{j \geq 60} \end{cases}$$

The AIME is then the average of the highest 35 years of indexed earnings:

$$(16)\ AIME_k = \frac{1}{35} \sum_{i=1}^{35} \tilde{e}_{k,(i)}$$

where $\tilde{e}_{k,(i)}$ denotes the i-th highest indexed earning year.

Primary insurance amount. The primary insurance amount (PIA) is computed from AIME using the standard bend-point formula:

$$(17)\ PIA_k = 0.90 \cdot min(AIME_k, b_1) + 0.32 \cdot max(0, min(AIME_k, b_2) - b_1) + 0.15 \cdot max(0, AIME_k - b_2)$$

where $b_1 = \$14{,}712$ and $b_2 = \$88{,}692$ are the annualized bend points in 2025.

Household Problem and Solution

Preferences. Each person has the following flow utility:

$$(18)\ u\left(c_j, n_{k,j}\right) = \frac{c_j^{1-\sigma} - 1}{1-\sigma} + \gamma\, ln\left(1 - n_{k,j}\right)$$

where c_j denotes consumption at age j, $n_{k,j} \in [0, 1)$ denotes hours worked by spouse k, $\sigma = 2$ is the coefficient of relative risk aversion, and $\gamma = 0.30$ governs the taste for leisure.

The representative household consists of a married couple. Both spouses consume a single household good c_j and independently supply labor. The couple maximizes a unitary household utility function:

$$(19)\ U(c_j, n_{1,j}, n_{2,j}) = \frac{c_j^{1-\sigma} - 1}{1 - \sigma} + \gamma\left[ln(1 - n_{1,j}) + ln(1 - n_{2,j})\right]$$

Like the PWBM, households enter the economy at age 21, retire at 67, and live to a maximum age of 100. The discount factor is $\beta = 0.97$.

Productivity. Individual productivity for spouse ***k*** at age ***j*** is:

$$(20)\ z_{k,j} = exp(\epsilon_j + \tilde{z}_k + \tilde{z}_{k,j})$$

where ϵ_j is a deterministic age-efficiency profile (quadratic in normalized age), $\tilde{z}_k$ is a permanent type drawn at birth, and $\tilde{z}_{k,j}$ is a persistent shock following:

$$(21)\ \tilde{z}_{k,j} = \rho\, \tilde{z}_{k,j-1} + \eta_{k,j}, \quad \eta_{k,j} \sim N(0, \sigma_\eta^2)$$

with $\rho = 0.990$ and $\sigma_\eta^2 = 0.007$. For computational ease, we discretize this process onto a grid of $n_z = 5$ points using Tauchen's method (Tauchen 1986), which produces a transition matrix $\mathbf{\Pi}$ with entries $\mathbf{\Pi_{z,z'}} = Pr(\tilde{z}_{k,j+1} = z' | \tilde{z}_{k,j} = z)$.

The permanent type $\tilde{z}_k$ is drawn from a discrete distribution with four types:

Type	**Low**	**Medium**	**High**	**Very High**
$\tilde{\mathbf{z}}_\mathbf{k}$	−0.45	0.10	0.85	1.20

Probability	0.40	0.45	0.12	0.03

All households are couples. There are 4 × 4 = 16 couple types, formed by pairing permanent productivity types $(\bar{z}_1, \bar{z}_2)$. The joint probability of a couple with types (i, j) incorporates assortative mating:

$$(22)\ P(i,j) \propto p_i \cdot p_j \cdot exp\left(\rho_a \cdot \left(1 - \frac{|i-j|}{n-1}\right)\right)$$

where $\rho_a = 0.6$ and $n = 4$. There is no marriage market, divorce, or remarriage; couples dissolve only through spousal death.

Labor supply. Once productivity has been determined, wages follow from the marginal product of labor. Labor supply is determined by the intratemporal first-order condition:

$$(23)\ n_{k,j} = 1 - \frac{\gamma}{w\, z_{k,j}(1 - MTR_{k,j}) \cdot c_j^{-\sigma}}$$

This equates the marginal disutility of labor, $\frac{\gamma}{(1-n_{k,j})}$, to the after-tax marginal return to working, $w\, z_{k,j}(1 - MTR_{k,j})$, valued at the marginal utility of consumption $c_j^{-\sigma}$. Because $MTR_{k,j}$ depends on labor income, which depends on $n_{k,j}$, this is solved by fixed-point iteration.

Budget constraint. A couple at age $\boldsymbol{j}$ with assets $\boldsymbol{a_j}$ faces:

$$(24)\ c_j + a_{j+1} + \tau_j = wz_{1,j}n_{1,j} + wz_{2,j}n_{2,j} + (1+\pi)a_j + b_j^{SS}$$

$$(25)\ a_{j+1} \geq 0$$

where $\tau_j = \tau(wz_{1,j}n_{1,j}, wz_{2,j}n_{2,j}, b_j^{SS}, c_j)$ is the tax function described in Section 3 and b_j^{SS} denotes Social Security benefits (zero during working years, positive during retirement).

Bellman Equation. The couple's problem is:

$$(26)\ V^c(a_j, z_{1,j}, z_{2,j}, j) = \max U(c_j, n_{1,j}, n_{2,j}) + \beta E_j[V_{j+1}]$$

subject to the budget constraint above. The continuation value reflects gender-specific mortality. At each age, either both spouses survive, only spouse 1 survives, or only spouse 2 survives:

$$(27)\ E_j[V_{j+1}] = s_j^m s_j^f E[V_{j+1}^c] + s_j^m(1 - s_j^f) E[V_{j+1}^{s1}] + (1 - s_j^m)s_j^f E[V_{j+1}^{s2}]$$

where s_j^m and s_j^f are male and female survival probabilities from the SSA's 2022 period life tables.

Endogenous Grid Method (EGM). We solve the household problem by backward induction from age $\boldsymbol{J} = \mathbf{100}$. At the terminal age, households consume all available resources. Working backward, we employ the endogenous grid method (EGM) to avoid root-finding.

EGM relies on analytically inverting the Euler equation. The intertemporal first-order condition is:

$$(28)\ c_j^{-\sigma} = \beta(1 + \boldsymbol{\pi})\Big[s_j^m s_j^f \textstyle\sum_{z_1' z_2'} \boldsymbol{\Pi}_{\mathbf{z_1},\mathbf{z_1'}} \boldsymbol{\Pi}_{\mathbf{z_2},\mathbf{z_2'}} (c_{j+1}^c)^{-\sigma} + s_j^m(1 - s_j^f) \textstyle\sum_{z_1'} \boldsymbol{\Pi}_{\mathbf{z_1},\mathbf{z_1'}} (c_{j+1}^{s1})^{-\sigma} +$$

$$(1 - s_j^m)s_j^f \textstyle\sum_{z_2'} \boldsymbol{\Pi}_{\mathbf{z_2},\mathbf{z_2'}} (c_{j+1}^{s2})^{-\sigma}\Big]$$

where c_{j+1}^c, $c_{j+1}^{s_1}$, and $c_{j+1}^{s_2}$denote next-period consumption under the couple and widow scenarios, respectively. The two spouses' persistent productivity shocks are independent, so the joint transition probability is $\boldsymbol{\Pi}_{\mathbf{z_1},\mathbf{z_1'}} \cdot \boldsymbol{\Pi}_{\mathbf{z_2},\mathbf{z_2'}}$, where $\boldsymbol{\Pi}$ is a discretized matrix form of the AR(1) process.

For each candidate a_{j+1} on the exogenous asset grid, we compute c_j from the Euler equation, solve for optimal hours $(n_{1,j}^*, n_{2,j}^*)$ by iterating on the intratemporal conditions, and back out today's assets from the budget constraint:

$$(29)\ a_j \; = \; \frac{a_{j+1} + c_j + \tau_j - wz_{1,j}n_{1,j} - wz_{2,j}n_{2,j} - b_j^{SS}}{1 + \pi}$$

This produces an endogenous grid $\{a_i^{endo}, c_i, n_{1,i}, n_{2,i}\}$, which is interpolated back onto the original asset grid. For households at the borrowing constraint ($a_{j+1} \; = \; 0$), we solve directly by iterating on the budget constraint.

The survivor problems are solved first, as their value functions enter the couple's continuation value. Because Social Security benefits depend on lifetime earnings, which depend on labor supply, the model uses a two-pass procedure: first solving with fixed hours ($n \; = \; 0.35$) to compute initial AIMEs, then re-solving with equilibrium hours and updated benefits.

Steady State and General Equilibrium

We find the steady state by iterating on the capital-labor ratio $\frac{K}{L}$:

1. **Initialize.** Guess an initial capital-labor ratio $(K/L)^0$.

2. **Prices.** Given $(K/L)^i$, compute factor prices:

$$(30)\ w^i = (1 - a)\left(\frac{K}{L}\right)_i^a, \; r_K^i = a\left(\frac{L}{K}\right)_i^{1-a}, \; \pi^i = r_K^i - \delta$$

Compute $\psi_{cap} \; = \frac{K}{K + D}$ and $\psi_{debt} \; = \frac{D}{K + D}$, where $D \; = \; 0.78 \; \cdot \; Y$.

3. Household problems. For each of the 16 couple types, taking prices as given:

(a) Solve the two survivor problems by EGM backward induction.

(b) Solve the couple problem by EGM, using the survivor value functions in the continuation value.

(c) Compute AIME via the two-pass procedure (fixed hours, then equilibrium hours).

(d) Re-solve with updated benefits.

(e) Compute the stationary distribution over $(a_j, z_{1,j}, z_{2,j}, j, m)$ by forward iteration, where $m \in \{couple, survivor1, survivor2\}$.

The 16 couple-type problems are solved in parallel.

4. Aggregation. Aggregate across couple types, weighting by $P(i,j)$:

$$(31)\ A^i = \sum\nolimits_{\text{types}} P(i,j) \sum\nolimits_{j,m} \mu\,(a_j, z_{1,j}, z_{2,j}, j, m) \cdot a_j$$

$$(32)\ L^i = \sum\nolimits_{\text{types}} P(i,j) \sum\nolimits_{j,m} \mu\,(a_j, z_{1,j}, z_{2,j}, j, m) \cdot (z_{1,j}n_{1,j} + z_{2,j}n_{2,j})$$

5. Implied capital-labor ratio. $K^{implied} = \psi_{cap} \cdot A^i$, and $(K/L)^{implied} = \frac{K^{implied}}{L^i}$.

6. Calibrate μ. Update $\mu = \$63{,}000/\bar{e}_{model}$ so that model average earnings match the US average.

7. Update. $(K/L)^{i+1} = 0.7 \cdot (K/L)^i + 0.3 \cdot (K/L)^{implied}$.

8. Convergence. Repeat until $|(K/L)^{implied} - (K/L)^i| / |(K/L)^i| < 10^{-4}$.

Stationary Distribution

The distribution over $(a_j, z_{1,j}, z_{2,j}, j, m)$ is computed by forward iteration from age 21 to 100. At age 21, all households enter as couples, uniform over $(z_{1,j}, z_{2,j})$. At each subsequent age:

Productivity: Each spouse's persistent shock transitions via Π, which is the discretized matrix version of the AR(1) persistent labor shock process. For each household, the joint transition is $\Pi_{z_1,z'_1} \cdot \Pi_{z_2,z'_2}$.

Assets: Mass flows to $a'^{(a_j,z_{1,j},z_{2,j},j)}$, distributed to adjacent grid points via linear interpolation.

Mortality: With probability $s_j^m s_j^f$, both survive (couple). With probability $s_j^m(1 - s_j^f)$, mass flows to survivor$_1$. With probability $(1 - s_j^m)s_j^f$, mass flows to survivor$_2$.

Population growth: Each cohort is discounted by $\frac{1}{1 + g_n}$.

Distributions are normalized to sum to one.

Projection Methodology

The projection engine takes the steady-state solution and extrapolates it forward over a 75-year horizon (2025–2099).

Exogenous growth paths. Three exogenous growth rates, derived from the 2025 Social Security Trustees' Report intermediate scenario, drive the projection:

Variable	Symbol	Baseline Value
Productivity growth	$g_{A,\tau}$	1.12%
Population growth	$g_{n,\tau}$	0.5%
Inflation (CPI-W)	$g_{\pi,\tau}$	2.3%

Cumulative indices are:

$$(33)\ A_t = \sum_{\tau=1}^{t}(1 + g_{A,\tau})$$

$$(34)\ P_t = \sum_{\tau=1}^{t}(1 + g_{n,\tau})$$

$$(35)\ \Pi_t = \sum_{\tau=1}^{t}(1 + g_{\pi,\tau})$$

$$(36)\ W_t = \sum_{\tau=1}^{t}(1 + g_{A,\tau} + g_{\pi,\tau})$$

Demographics. The dependency ratio (retirees per worker) evolves along a logistic path:

$$(37)\ \boldsymbol{d_t = d_0 + \frac{d_\infty - d_0}{1+\exp(-k(t-\bar{t}))}}$$

where $d_0 \approx 0.29$, $d_\infty = 0.45$, $\kappa = 0.08$, and $\bar{t} = 25$. The number of retirees scales as $N_t^{ret} = N_{ss}^{ret} \cdot \left(\frac{d_t}{d_0}\right) \cdot N_{hh,t}$.

Trust fund dynamics. Cash flow is $\boldsymbol{CF_t = R_t^{FICA} + R_{btax,t}^{OASI} - S_t}$. Interest accrues only while $\boldsymbol{TF_t > 0}$:

$$(38)\ TF_{t+1} = TF_t + CF_t + r_{TF} \cdot max(TF_t, 0)$$

The depletion year is the first t such that $TF_t < 0$.

Reform scoring. Unlike most other models, we do not solve for the transition path directly. Instead, we adopt the back-of-the-envelope approach from Mankiw and Weinzierl (2006). We solve two steady states—one under current law ($\boldsymbol{K^{base}, L^{base}}$) and one under the reform ($\boldsymbol{K^{ref}, L^{ref}}$)—and assume that capital and labor converge to the reform steady state at rate $\boldsymbol{\lambda}$:

$$(39)\ \ln K_t - \ln K^{ref} = (ln\, K^{base} - ln\, K^{ref})e^{\lambda t}$$

$$(40)\ \ln L_t - \ln L^{ref} = (ln\, L^{base} - ln\, L^{ref})e^{\lambda t}$$

where $\lambda < 0$ is the negative eigenvalue of the Jacobian of the linearized Ramsey system. The dynamic system in capital and consumption is:

$$(41)\ \dot{k} = k^\alpha - c - (\delta + g_A)k$$

$$(42)\ \dot{c} = \frac{c}{\sigma}((1 - s_k)\alpha k^{\alpha-1} - \delta - \rho - \sigma g_A)$$

where $\rho = \frac{1}{\beta} - 1$. The Jacobian evaluated at the steady state is:

$$(43)\ \mathbf{J} = \begin{pmatrix} \rho_{eff} & -1 \\ \frac{c^*}{\sigma}(1 - s_k)a(a-1)(k^*)^{a-2} & 0 \end{pmatrix}$$

where $\rho_{eff} = \rho + (\sigma - 1)g_A$. The negative eigenvalue is:

$$(44)\ \lambda = \frac{\rho_{eff} - \sqrt{p_{eff}^2 + 4\frac{c^*}{\sigma k^*}(1-a)r_K^*}}{2}$$

Given the transition paths of K_t and L_t, all macro aggregates are derived from the production function rather than by blending steady-state ratios:

$$(45)\ Y_t = K_t^{\alpha} L_t^{1-\alpha}, \quad w_t = (1 - \alpha)\left(\frac{K_t}{L_t}\right)^{\alpha}, \quad r_{K,t} = \alpha\left(\frac{L_t}{K_t}\right)^{1-\alpha}$$

Payroll is $w_t \cdot L_t$, corporate profits follow from $Y_t - w_t L_t - \delta K_t$, and fiscal variables are computed from these aggregates. Distributional variables (payroll tax rate, fraction of earnings above the cap, benefit levels per retiree, benefit taxation rates) are interpolated between the two steady states using the weight $\omega_t = 1 - e^{\lambda(t - t_{ref})}$.

Output metrics. The projection produces year-by-year series for: nominal GDP, average earnings, the payroll tax cap, taxable payroll, FICA revenue, Social Security outlays, average benefit per retiree, benefit tax revenue (OASI and HI), trust fund interest, cash flow, trust fund balance, effective FICA rate, cost rate, debt, and debt-to-GDP. Summary statistics are reported at 10-year, 30-year, and 75-year actuarial windows.

Baseline calibration. The model is calibrated to exactly match SSA's 2025 intermediate scenario projections. We do this by calculating a dependency ratio that would replicate the SSA's projected cost rate path under current law, given the SSA's wage growth, inflation, and benefit formula assumptions.