PENN WHARTON
UNIVERSITY of PENNSYLVANIA
Budget Model

Policy Options for Reducing the Federal Debt: Spring, 2024

Summary: We analyze the budgetary and economic effects of three very different illustrative policy bundles that reduce federal budget deficits over time without shrinking the economy relative to current law with rising debt. The results also demonstrate how federal debt falls short of measuring the true fiscal burden being shifted to future generations.

Key Points

- We consider three different bundles, with each bundle consisting of multiple fiscal policy options and its own distinct theme reflecting our discussions with experts across the policy spectrum: 1) raising taxes on corporations and high-income households; 2) broad-based changes to Social Security, Medicare and the employer deductibility of health care; and 3) a mixture of broad-based new tax revenues, including a carbon tax and a value-added tax, along with discretionary spending cuts.
- As a constraint, all options were required to at least not reduce macroeconomic performance relative to current law, which has an increasing debt-GDP ratio. Over time, GDP and wages remain flat under Bundle 1 because the reduction in debt is offset with higher distortions. GDP climbs 9.8 percent by 2054 in Bundle 2 and by 5.9 percent with Bundle 3.
- On a conventional basis, each policy bundle reduces deficits between $3.4 trillion (Bundle 2) and $6 trillion (Bundle 3) over the 10-year budget window. After 10 years, the bundles differ in their debt reduction, mainly due to differences in phase-in periods. None of the policy bundles fully stabilize the debt-GDP ratio over time, indicating that larger reforms are still needed.
- Despite Bundle 3 reducing deficits the most over time, Bundle 2 produces more economic growth. The core reason is that Bundle 2 also reduces “implicit” debt, which is over twice as large as U.S. Treasury “explicit” debt that is widely reported.

Introduction

The Penn Wharton Budget Model projects that U.S. federal government debt held by the public will grow to 192 percent of the size of the economy (gross domestic product) by 2050 and to 217 percent by 2054. Our previous analysis has indicated that financial markets would likely demand large enough returns on federal debt to make continuation of current law unsustainable at around 190 percent of GDP.[1] For the current analysis, we optimistically ignore this particular feedback channel to compare larger reform packages.[2]

We consider three different bundles, with each bundle consisting of multiple fiscal policy options and its own distinct theme: 1) raising taxes on corporations and high-income households; 2) broad-based changes to Social Security, Medicare, the employer deductibility of health care and non-defense discretionary spending; and 3) a mixture of broad-based new tax revenue and discretionary spending cuts. The policy bundles reflect our discussions across the political spectrum with leading economists, however, no single bundle represents the view of a single group or individual. Instead, we assembled broadly consistent views within each part of the political spectrum with the goal of deficit reduction without reducing economic activity relative to current policy with sharply rising debt.

We have also not tried to force an equal debt reduction across the bundles, either on a static or dynamic basis, at any specified time horizon. Doing so would essentially force the policy changes under Bundle 1 to expand enough that they would produce economic losses unless additional broad-based tax increases or spending cuts were introduced that impacted households without high income. In fact, none of the policy bundles---despite their apparent size---are sufficiently large enough to completely stabilize the debt-GDP ratio over time, which is quite informative of the scope of the problem.

Of course, policy bundles cannot be fully compared purely based on debt reduction and macroeconomic performance. We will update this document soon with more information about distributional effects.

Our Model

Our analysis of each policy bundle starts with our microsimulation model, which is estimated across a range of datasets to represent hundreds of thousands of different types of households, differentiated across 60 demographic and economic attributes. The PWBM microsimulation model interacts with various fiscal tax and spending modules. The PWBM tax module estimates individual income taxes, payroll taxes, corporate taxes, and estate taxes. It also simulates behavioral responses to changes in tax policy, calculating conventional estimates of the budgetary effects of tax policies and effective tax rates for different demographic groups. The various conventional elasticities applied include income classification, business formation classification, income timing and other material changes. The PWBM Social Security module estimates old age, dependent, survivor, and other auxiliary benefits as well as other rules. All major elements of benefits policy are parameterized, allowing for detailed analysis of reform proposals that highlights how structural shifts in demographic and economic forces affect Social Security's finances.

This conventional modeling informs our core heterogeneous-agent overlapping-generations dynamic model (OLG). The OLG model allows for labor supply changes, capital intensity changes, and productivity changes in response to various tax (Bundle 1) and spending programs (Bundles 2 and 3). For example, a reduction in carbon from a carbon tax (Bundle 3) produces some productivity gains over time, which is consistent with data-driven estimates.

Our OLG model also fully merges the private and public healthcare sectors into the rest of the economy. As such, U.S. private healthcare (employer) and public healthcare (Medicare, Affordable Care Act, Medicaid, and other programs) are modeled in detail.[3] When making labor supply and savings decisions, households simultaneously make decisions about whether to buy health insurance, whether to pay out of pocket for a healthcare shock, and even how to alter labor supply and savings to qualify for ACA premium support or Medicaid. Employers make competitive decisions about offering compensation and tax-preferred group healthcare in the presence of competition for talent in labor markets. Workers with low enough productivity--- where the cost of their health care coverage plus a minimum wage level of income is less than their marginal product---are not offered health coverage through their employer, consistent with current evidence. Healthcare premiums are computed in general equilibrium along with factor prices (wages and interest rates). Unlike factor prices, health prices are subject to various current-law rules regarding information restrictions and risk ratings, the net effect of which can lead to dynamic adverse selection over time and moral hazard.[4] Investments in healthcare by the government or by an individual improve individual productivity (and wages) by health state, longevity, population size, and government revenue and spending, even in non-health programs. At the same time, non-health related changes in wages can impact elective decisions for healthcare and alter labor and savings decisions to qualify for Medicaid.

The analysis presented below, therefore, considers potentially complicated interactions of policies within each policy bundle. For Bundle 2, reducing the deductibility of employer healthcare increases other after-tax compensation through competitive labor markets, which is now taxable. But it also reduces private insurance coverage with more people electing ACA or Medicaid, at a cost to the government, or going without coverage, which can reduce their productivity. At the same time, Bundle 2 changes to Social Security and Medicare encourage more household saving and labor supply, that can materially impact non-payroll federal tax revenue and mitigate some of the reduction in health care coverage. A carbon tax (Bundle 3) can directly increase productivity over time while also raising immediate revenue.

In general, failing to account for interactions between fiscal policies can substantially understate or overstate the impact of a given policy change on total revenue, total costs, and the economy. Indeed, the distinct modeling of Social Security, Medicare, and the rest of federal government without capturing interactions can lead to first-order biases.

The Policy Bundles

Bundle 1: Increase Taxes on High Income Households and Corporations

This bundle includes the following revenue raisers and spending provisions:

- **Raise the top rate on ordinary income from 37 percent to 45 percent:** Under current law, the top marginal income tax rate, which applies to any taxable income above $578,125 for single filers, is 37 percent and is scheduled to rise to 39.6 percent starting in 2026. This policy change would increase the top rate to 45 percent starting in 2025.
- **Introduce a third AMT income bracket, taxing at 45 percent income above $1 million:** Under current law, high-income taxpayers must file taxes under the Alternative Minimum Tax (AMT) system in addition to

the normal income tax system and pay taxes according to the greater of the two. This policy change would adjust the AMT so that it has a third bracket that applies a marginal rate of 45 percent on incomes above $1 million for married filers. This policy would take effect in 2025.

- **Tax capital gains and dividends at ordinary rates:** Under current law, preferential tax rates are applied to capital gains held for a minimum period and qualifying dividends. Moreover, the basis of unrealized capital gains is stepped-up when assets are transferred at the time of death. This policy change would tax all income from capital gains and dividends using the ordinary income tax rate structure and would also subject capital gains without stepped-up basis to those rates at the time of the holder's death, starting in 2025.

- **Double the Social Security taxable maximum earnings threshold:** Under current law, only taxable earnings up to $168,600 are subject to OASDI payroll taxation. This policy change would raise that threshold to $337,200 starting in 2025.

- **Raise the corporate income tax rate from 21 percent to 28 percent:** Under current law, corporations face a tax rate of 21 percent. This policy change would increase that rate to 28 percent, starting in 2025.

- **Implement paid family leave:** Under current law, employees eligible for FMLA may take up to 12 weeks (about 3 months) of unpaid leave during a 12-month period for qualifying life events such as the care of a newborn or adopted child, to care for immediate family members, or to take medical leave. The policy change would provide up to 12 weeks of partial wage replacement, starting in 2025. PWBM assumes that over time the take-up rate of eligible leave takers increases from currently about 20 percent to 67 percent in 2060. This policy would take effect in 2025.

At first glance, including family leave as a new expenditure seems inconsistent with debt reduction. However, in our discussions with this part of the political spectrum, this expenditure seemed uniformly supported and part of a minimal viable package required for their support.

If enacted in 2025, Table 1 shows that Bundle 1 would generate net revenues (deficit reduction) of $3.7 trillion over the 10-year budget window and $16 trillion over the 2025-2054 period on a *conventional* basis, that is, before dynamic feedback effects.

Table 2 shows that the macroeconomic performance would differ very little over the next 30 years from current law, as GDP, the capital stock, hours worked, and average wages in 2054 are similar to the current-law baseline. However, debt-to-GDP declines from 217 percent under our baseline to 186 percent under this policy, although still growing and unsustainable. Intuitively, the economic effects are mainly a wash because the gains from debt reduction are mostly offset by the increase in economic distortions caused by the new tax rates.

Attempting further debt reduction with this approach would lead to economic decline relative to the baseline economy with growing debt. Distortions to economic activity increase by the *square* of the tax rates, which tends to favor broader tax bases over narrower ones for macroeconomic performance before considerations of distribution. Raising more revenue in Bundle 1 would generally require broader-based participation.

Table 1: Budget Effects of Bundle 1, Increase Taxes on High Income Households and Corporations

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

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Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Raise the top rate on ordinary income from 37 percent to 45 percent	69	83	74	78	80	83	86	90	94	98	834	3,885
Introduce a third AMT income bracket, taxing at 45 percent above $1 million	0	95	116	119	125	127	133	139	145	151	1,150	5,829
Tax capital gains and dividends at ordinary rates	37	59	44	46	43	42	44	45	47	48	455	1,799
Double the Social Security taxable maximum earnings threshold	77	107	109	114	118	122	126	131	134	138	1,176	5,052
Raise the corporate tax rate from 21 percent to 28 percent	68	98	103	106	107	108	111	114	116	119	1,050	4,322
Implement paid family leave	-16	-26	-32	-36	-40	-44	-46	-50	-53	-55	-397	-2,224
Interaction effects	0	-70	-51	-53	-56	-58	-60	-63	-66	-69	-546	-2,683
Total	**235**	**347**	**363**	**373**	**377**	**380**	**394**	**405**	**417**	**430**	**3,722**	**15,980**

Table 2: Economic Effects of Bundle 1, Increase Taxes on High Income Households and Corporations

Percent Change from Baseline unless otherwise indicated

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	2030	2035	2040	2045	2050	2054
Gross domestic product	-0.3	-0.4	-0.5	-0.5	-0.3	-0.1
Capital stock	-0.3	-0.7	-0.9	-0.9	-0.7	-0.3
Hours worked	0.2	0.3	0.3	0.3	0.4	0.6
Average wage	0.2	0.0	-0.1	-0.1	-0.1	0.1
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	105	116	129	146	166	186

Bundle 2: Broad-based changes to Social Security, Medicare, the Healthcare Deduction, and Non-Military Discretionary Spending

This bundle includes the following provisions that mainly impact Social Security and Medicare:

- **Raise the full-benefit Social Security retirement age from 67 to 70 over time:** Under current law, the Normal Retirement Age for Social Security, or the age at which beneficiaries can claim the full benefit amount that is calculated based on their career average monthly earnings, is 67 for individuals born in 1960 or later. This policy change would gradually continue to increase the normal retirement age ("NRA") by two months per year until it reaches 70. The policy change would affect households who are 50 years old in 2025, who would face an NRA of 67 plus two months when they turn 62 in 2037. By delaying the time until the policy change takes full effect until 2037, this policy change creates a "flat region" for the increase in the NRA. The Appendix shows the impact of extending the NRA along its roughly current path that would impact individuals older than age 50 in 2025. A key insight shown in the Appendix is that the speed of adjustment has a first-order impact on potential macroeconomic gains.

- **Flattening Social Security benefits over time:** Under current law, Social Security benefits are calculated by taking a beneficiary's lifetime average monthly earnings and applying a set of fixed percentages to each segment of those earnings. This policy change would introduce a new *minimum* benefit in 2037 equal to the federal poverty line. The minimum benefit, therefore, increases benefits for some retirees, currently age 50 or younger in 2025, who have low income throughout their working ages. A new *maximum* benefit would also be phased in over time: a set of fixed percentages that apply to each segment of lifetime earnings would gradually decrease over a 20-year period, starting from the current-law values of 90 percent, 32 percent, and proceeding to 15 percent to 90 percent, 4 percent, and 0 percent, over 20 years. While the minimum benefit is fully implemented in 2037, only the first year of this 20-year period transition starts in 2037 so that it only applies to individuals 50 years of age and younger in 2025. Specifically,

individuals who are 50 years old in 2025 can claim early benefits at age 62 in exchange for a benefit reduction or they can claim full benefits at the NRA. This individual would qualify for the full minimum benefit at the NRA (or a discounted value as early as age 62) but the maximum benefit would be reduced by around 1/20th of the full reduction in the maximum benefit noted above. The new maximum benefit would be fully phased in by 2056, that is, for individuals aged 30 or younger in 2025. When combined with the minimum benefit, this policy, therefore, mostly flattens Social Security benefits independently of earnings history. In essence, for the cohort born in 1994 or later, Social Security would be fully transformed from a pension into a retiree poverty-relief program, thereby requiring additional consumption to be financed using private savings. The Appendix considers the effect of applying this 20-year benefit adjustment at a faster rate.

- **Raise the Medicare eligibility age from 65 to 67:** Under current law, most people qualify for Medicare coverage upon reaching age 65 and some individuals become eligible earlier if they have certain medical conditions. This policy change would increase the eligibility age by two months every calendar year to a maximum age of 67, while leaving unchanged the separate qualifying parameters for individuals with certain disabilities. This policy starts in 2025, with an eligibility age of 65 plus two months, so that people retiring in 2036 would be the first cohort to face the eligibility age of 67.

- **Convert Medicare to premium support:** This policy would convert Medicare to a premium support system that would allow beneficiaries to choose from competing insurance plans while the federal government would share the cost of premiums. Previous proposals have differed in many respects, particularly how the federal contribution would be set. The policy change we model would allow private health insurance companies to submit bids to provide Medicare Part B services to beneficiaries.[5] The average bid amount, including that from Medicare fee-for-service, would become the benchmark. The federal government would pay insurers the benchmark rate for a region minus a standard premium paid by enrollees. Enrollees that choose to enroll into an insurance plan that places a bid at the benchmark rate would pay a standard insurance premium directly to the insurer. That premium would be the same everywhere and would cover about 25 percent of total insured expenses under Medicare Part B. Beneficiaries that enroll into a plan with an above (below) benchmark bid would pay the standard premium and (less) the difference between the bid and the benchmark. This policy would take effect in 2025.

- **Limit the tax exclusion of employer-sponsored health insurance:** Under current law, employees who enroll in employer-sponsored health insurance plans may exclude the full amount of their health insurance premiums from their taxable income. This policy would limit the amount of employer-provided health insurance premiums that can be excluded to a value equal to the median health insurance premium. This policy would take effect in 2025.[6]

- **Cut annual non-defense discretionary spending by 5 percent:** Under current law, about 70 percent of the federal budget is for mandatory programs, for which spending is set by predetermined formulas, and interest payments on the national debt. About 30 percent of the budget is for “discretionary” programs, which are the programs for which spending is controlled by annual appropriations acts. About half of discretionary spending is defense spending, while the other half is comprised of education, transportation, housing, and more. This policy change would reduce the non-defense portion of discretionary spending by 5 percent each year relative to currently projected levels. This policy would take effect in 2025.

Table 3 shows that Bundle 2 would decrease net outlays by $3.4 trillion over the 10-year budget window and $25 trillion over the 2025-2054 period on a conventional basis. Notice that while the debt reduction during the first decade is a bit smaller than for Bundle 1, the debt reduction in later years is larger. The main reason is that the policies in Bundle 1 start in 2025. In contrast, the start of several of the larger spending reductions in Social Security and Medicare in Bundle 2 are delayed by over a decade---to give households time to respond with additional saving---and, even then are phased in over the subsequent 20 years.

As Table 4 shows, GDP increases by 9.8 percent by 2054. The debt-to-GDP ratio decreases significantly over the next 30 years, from 217 percent under the current-law baseline to 152 percent under Bundle 2 by 2054.

Most of the increase in GDP is driven by a larger capital stock, which increases by 19.8 percent by 2054. Households must replace some Social Security income and Medicare benefits with additional private saving. This "crowd in" of capital is especially effective for households facing fewer borrowing constraints, including higher-income households that are relatively more impacted by these changes due to progressive tilting of benefits in Social Security.

Labor supply ("Hours Worked") also increases over time but by less than capital. Labor supply is impacted by several competing factors. First, labor supply increases to replace some lost retirement income. Second, labor supply responds to the larger wage rate, which increases by 7.5 percent over time. In equilibrium, wages would have increased a bit more without the increase in labor supply itself. Third, the move to a flat benefit completely disconnects payroll taxes paid from benefits received at the margin. Under current law, Social Security's *effective* tax rate---which determines the labor supply distortion---is less than the *statutory* rate due to the payroll wage (and, hence, tax) and benefit linkage. That linkage gets removed with a flat tax, which, therefore, increases the effective tax rate to be equal to the statutory rate.

Table 3: Budget Effects of Bundle 2, Broad-based changes to Social Security, Medicare, the Healthcare Deduction, and Non-Military Discretionary Spending

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

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Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Raise the full-benefit Social Security retirement age from 67 to 70	0	0	0	0	0	0	0	0	0	0	0	1,610
Flat monthly Social Security benefit set at elderly poverty threshold and indexed to wage growth	0	0	0	0	0	0	0	0	0	0	0	2,532
Raise the Medicare eligibility age from 65 to 67	0	0	50	52	55	57	60	63	66	69	472	5,014
Convert Medicare to premium support	80	83	87	91	95	99	104	108	114	119	981	4,811
Limit exclusion of employer-sponsored health insurance	100	116	126	136	147	159	172	185	199	213	1,552	9,669
Cut annual non-defense discretionary spending by 5 percent	0	47	49	51	53	55	57	59	61	63	495	2,242
Interaction effects	-1	-1	-6	-6	-7	-6	-7	-7	-9	-9	-59	-917
Total	**179**	**245**	**306**	**324**	**344**	**364**	**385**	**408**	**431**	**455**	**3,441**	**24,961**

Table 4: Economic Effects of Bundle 2, Broad-based changes to Social Security, Medicare, the Healthcare Deduction, and Non-Military Discretionary Spending

Percent Change from Baseline unless otherwise indicated

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	2030	2035	2040	2045	2050	2054
Gross domestic product	0.8	1.8	3.1	4.9	7.3	9.8
Capital stock	1.5	3.3	5.8	9.4	14.5	19.8
Hours worked	-0.7	-0.5	-0.2	0.2	0.7	1.4
Average wage	0.6	1.2	2.2	3.6	5.5	7.5
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	106	114	123	134	144	152

The Appendix presents alternative versions of Bundle 2 with faster implementation dates for the retirement policies. The results demonstrate the first-order importance of the timing of the policies; faster implementation leads to significantly larger macroeconomic gains over time.

Bundle 3: A Mixture of Broad-based Tax Increases and Spending Cuts

This bundle includes the following broad-based tax increases and spending cuts:

- **Enact a 1 percent Value-Added Tax (VAT):** Under current law, while it is very common for state governments to levy sales taxes, the federal government does not impose a broad-based consumption tax. This policy change would implement a value-added tax (VAT), or a tax on the difference between revenue and the cost of intermediate inputs, of 1 percent on a broadly defined base of consumption, with exemptions for certain categories such as health expenditures. This policy would take effect in 2025.
- **Disallow all itemized deductions except for charitable deductions:** Under current law, when individuals calculate their income tax liability, they can take either the standard deduction or a set of itemized deductions, which includes deductions for mortgage interest, state and local taxes, and charitable contributions, among others. Starting in 2025, this policy change would disallow all itemized deductions, and all taxpayers would claim the standard deduction.
- **Expand the base of employment taxes to cover all pass-through income:** Under current law, certain business earnings of limited partners and S corporation shareholders are not subject to self-employment payroll taxes. This policy would expand the self-employment payroll tax base to include all pass-through income, regardless of organizational form, and start in 2025.
- **Implement a carbon tax:** Under current law, the U.S. does not have a carbon tax. This policy change would levy a tax on coal, oil products, and natural gas in proportion to their carbon content, that would be

collected from fuel suppliers. This policy would enact a tax of $50 per ton of carbon produced and would reduce greenhouse gases by 7 percent in the first year (2025) and about 16 percent in 2054. This policy goes into effect in 2025.

- **Slow Social Security expenditure growth by indexing benefits to chained CPI:** Under current law, Social Security benefits are adjusted for inflation each year using the Consumer Price Index (CPI). This policy change would instead use a different version of CPI – chained CPI, which is the measure used to adjust most parameters of the tax system – to adjust benefit payments each year for inflation. The chained CPI adjustments would be about 0.2 percentage points lower per year than using the CPI. This policy goes into effect in 2025.

- **Increase Medicare premiums:** Under current law, premiums for Medicare parts B and D are income dependent. Beneficiaries with less than or equal to $103,000 of modified adjusted income pay $174.70 per month while households between $106,000 and 129,000 pay $244.60 per month. Households with higher MAGI pay higher monthly premiums. This policy change would increase Medicare premiums for the bottom income group to the level of income premiums in the second group (i.e. from 25 percent of Medicare cost to 35 percent). Under this policy, Medicare premiums would increase by an average of 27 percent. This policy would start in 2025.

If enacted in 2025, Table 5 shows that Bundle 3 would generate net revenues of $6.0 trillion over the 10-year budget window and $29 trillion over the 2025-2054 period on a conventional basis. As Table 6 shows, the capital stock and hours worked would be 12 percent and 1.5 percent higher, respectively, by 2054, which would increase GDP by roughly 6 percent. Debt-to-GDP would decrease from 217 percent under our current-law baseline to 146 percent under this policy.

Table 5: Budget Effects of Bundle 3, A Mixture of Broad-based Tax Increases and Spending Cuts

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

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Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Enact a 1 percent Value-Added Tax (VAT)	68	94	97	100	104	108	112	115	119	123	1,039	4,468
Disallow all itemized deductions except charitable deduction	18	128	255	264	276	288	301	314	327	339	2,508	12,779
Expand the base of employment taxes to cover all pass-through income	49	66	68	71	73	76	79	82	85	88	738	3,305
Implement a carbon tax	85	80	77	75	72	75	80	83	86	89	803	3,482
Slow Social Security benefit growth by indexing benefits to chained CPI	3	5	8	12	15	19	22	26	30	33	173	1,636
Increase Medicare premiums	68	70	72	75	77	80	82	85	88	91	788	3,391
Interaction effects	0	0	0	0	0	0	0	0	0	0	-1	-5
Total	**290**	**443**	**577**	**596**	**617**	**645**	**675**	**705**	**735**	**763**	**6,047**	**29,056**

Table 6: Economic Effects of Bundle 3, A Mixture of Broad-based Tax Increases and Spending Cuts

Percent Change from Baseline unless otherwise indicated

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	2030	2035	2040	2045	2050	2054
Gross domestic product	1.1	1.9	2.7	3.6	4.7	5.9
Capital stock	2.2	3.7	5.4	7.3	9.7	12.2
Hours worked	0.3	0.4	0.6	0.8	1.1	1.5
Average wage	0.9	1.5	2.2	3.0	3.9	4.9
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	101	107	114	123	134	146

Federal debt is reduced by substantially more relative to Bundle 2. Moreover, Bundle 3 benefits from some productivity gains associated with lower carbon emissions. Finally, all policies in Bundle 3 commence in 2025 and without gradual phase-in upon commencement.

However, Bundle 3 improves economic performance by less than Bundle 2. The reason is that federal debt fails to properly capture transfers across generations. For example, the *entire* current federal debt *held by the public*, equal to around $27 trillion at start of 2024, is less than the $62.7 trillion the PWBM calculates in present value benefits paid (or projected to paid) by the *Social Security and Medicare programs alone* to past and current generations *in excess* of the present value of payroll taxes collected from them. Ultimately, it is the totality of inter-generational transfers---not the fraction that happens to be ran through the U.S. Treasury auctions---that matters for economic performance. Bundle 2, therefore, reduces inter-generational transfers by more than indicated by federal debt alone.

Appendix

In this appendix, we present alternative results for Bundle 2 by changing the age of households that are affected by the two retirement policies in 2025:

- **Raise the full-benefit Social Security retirement age from 67 to 70**
- **Flat monthly Social Security benefits**

In the main text, both options apply starting with individuals who are 50 years old in 2025. That gives them 12 years---until they turn 62 in 2037---to prepare for those policy changes to take effect. Here we present the budget and economic effects for three alternative assumptions where either one or both policies start for those

who are 62 in 2025, thereby expediting the effect of the policy. Figure 1 shows how the full-benefit Social Security retirement ages change under the different scenarios based on beneficiaries' age in 2025.

Figure 1: Change in Full Retirement Age

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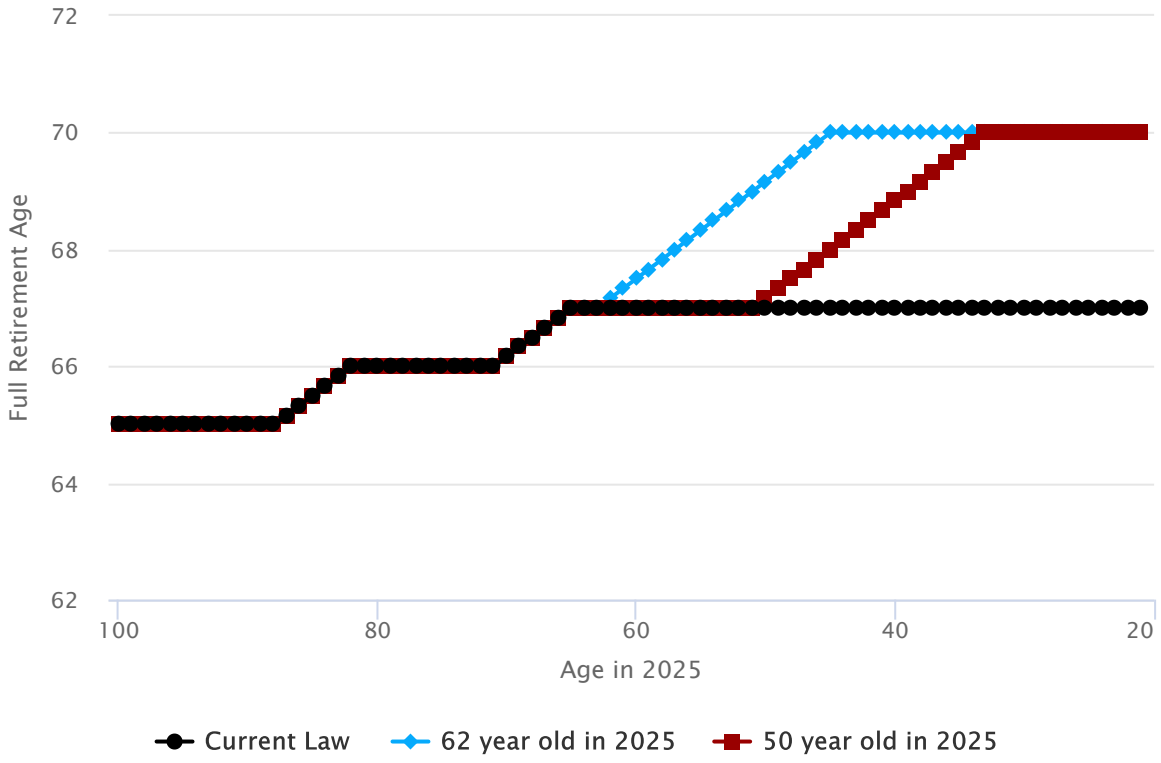

Appendix Option 1: Bundle 2, but Social Security retirement age increases for 62-year-olds in 2025.

Table 7 shows that if the retirement age increases for 62-year-olds in 2025, that policy change decreases net outlays by $3.6 trillion over the 10-year budget windows and by $28.9 trillion over the next 30 years. Compared to Bundle 2, this change in retirement eligibility lowers deficits by $134 billion over 10 years and $3.9 trillion over the next thirty years.

As Table 8 shows, the faster and bigger cuts to entitlements increase the capital stock by 23.2 percent, hours worked by 2 percent, and GDP by 11.4 percent. The debt-to-GDP ratio in 2054 is 151 percent, which is close to the 151 percent under Bundle 2. Compared to Bundle 2, the capital stock is 3.4 percentage points larger, and GDP is 1.7 percentage points larger.

Table 7: Budget Effects of Bundle 2, but Social Security retirement age increases for 62-year-olds in 2025

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

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Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Raise the full-benefit Social Security retirement age from 67 to 70	0	0	1	1	2	7	14	25	37	47	134	5,523
Flat monthly Social Security benefit set at elderly poverty threshold and indexed to wage growth	0	0	0	0	0	0	0	0	0	0	0	2,532
Raise the Medicare eligibility age from 65 to 67	0	0	50	52	55	57	60	63	66	69	472	5,014
Convert Medicare to premium support	80	83	87	91	95	99	104	108	114	119	981	4,811
Limit exclusion of employer-sponsored health insurance	100	116	126	136	147	159	172	185	199	213	1,552	9,669
Cut annual non-defense discretionary spending by 5 percent	0	47	49	51	53	55	57	59	61	63	495	2,242
Interaction effects	-1	-1	-6	-6	-7	-6	-7	-7	-9	-9	-59	-917
Total	**179**	**246**	**307**	**325**	**345**	**371**	**399**	**433**	**468**	**502**	**3,575**	**28,874**

Table 8: Economic Effects of Bundle 2, but Social Security retirement age increases for 62-year-olds in 2025

Percent Change from Baseline unless otherwise indicated

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	2030	2035	2040	2045	2050	2054
Gross domestic product	1.5	2.9	4.5	6.5	8.9	11.4
Capital stock	2.5	5.1	8.4	12.6	17.8	23.2
Hours worked	-0.2	0.2	0.5	0.9	1.4	2.0
Average wage	0.8	1.8	3.0	4.6	6.6	8.6
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	105	114	123	133	143	151

Appendix Option 2: Bundle 2, but the 20-year transition to a flat monthly benefit starts with 62-year-olds in 2025 rather than 50-year-olds.

If enacted in 2025, this option would decrease deficits by $3.6 trillion over the 10-year budget window and by $34 trillion over the next 30 years. Compared to Bundle 2, the flat monthly benefits now decrease outlays by $167 billion over the 10-year budget window and by $9 trillion over the next 30 years.

Like Appendix Option 1, this option cuts entitlement spending faster and bigger compared to Bundle 2. The result is that households save even more, increasing capital by 29 percent and hours worked by 2.2 percent in 2054. Combining the higher capital with an increase in labor generates GDP that is 29 percent larger than in the baseline economy, and 4.3 percentage points larger than under Bundle 2. The debt-to-GDP ratio under the policy is 141 percent in 2054, compared to the 217 percent under the current-law baseline.

Table 9: Budget Effects of Bundle 2, but the 20-year transition to a flat monthly benefit starts with 62-year-olds in 2025 rather than 50-year-olds

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

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Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Raise the full-benefit Social Security retirement age from 67 to 70	0	0	0	0	0	0	0	0	0	0	0	1,610
Flat monthly Social Security benefit set at elderly poverty threshold and indexed to wage growth	0	0	1	3	6	11	18	28	41	57	167	11,594
Raise the Medicare eligibility age from 65 to 67	0	0	50	52	55	57	60	63	66	69	472	5,014
Convert Medicare to premium support	80	83	87	91	95	99	104	108	114	119	981	4,811
Limit exclusion of employer-sponsored health insurance	100	116	126	136	147	159	172	185	199	213	1,552	9,669
Cut annual non-defense discretionary spending by 5 percent	0	47	49	51	53	55	57	59	61	63	495	2,242
Interaction effects	-1	-1	-6	-6	-7	-6	-7	-7	-9	-9	-59	-917
Total	**179**	**246**	**307**	**327**	**350**	**375**	**404**	**436**	**472**	**512**	**3,608**	**34,024**

Table 10: Economic Effects of Bundle 2, but the 20-year transition to a flat monthly benefit starts with 62-year-olds in 2025 rather than 50-year-olds

Percent Change from Baseline unless otherwise indicated

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	2030	2035	2040	2045	2050	2054
Gross domestic product	1.7	3.4	5.5	8.1	11.1	14.1
Capital stock	3.0	6.4	10.6	16.0	22.6	29.1
Hours worked	-0.9	-0.4	0.1	0.7	1.4	2.2
Average wage	1.1	2.4	3.9	5.9	8.4	10.7
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	105	113	121	130	136	141

Appendix Option 3: Bundle 2, but Social Security retirement age increases and flat monthly benefits start with 62-year-olds in 2025.

As shown in Table 11, this policy combines Appendix Options 1 and 2 and decreases deficit by $3.7 trillion over the 10-year-budget window and by $38 trillion over the next 30 years. Compared to Bundle 2, this policy decreases deficits by $301 billion over the 10-year budget window and by $13 trillion over the next 30 years. That is a 50 percent increase in deficit reduction compared to Bundle 2.

As a result, Table 12 shows that capital increases by 34 percent relative to the current-law baseline, working hours increase by 2.7 percent and GDP increases by 16 percent. The debt-to-GDP ratio under the policy is 129 percent in 2054, compared to the 217 percent under the current-law baseline. Compared to Bundle 2, this is a 22-percentage point decrease in the debt-to-GDP ratio.

Table 11: Budget Effects of Bundle 2, but Social Security retirement age increases and flat monthly benefits start with 62-year-olds in 2025

Conventional budgetary savings (+) or cost (-), billions of nominal dollars, excluding the effects of debt service

DOWNLOAD DATA

Policy	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2025-2034	2025-2054
Raise the full-benefit Social Security retirement age from 67 to 70	0	0	1	1	2	7	14	25	37	47	134	5,523
Flat monthly Social Security benefit set at elderly poverty threshold and indexed to wage growth	0	0	1	3	6	11	18	28	41	57	167	11,594
Raise the Medicare eligibility age from 65 to 67	0	0	50	52	55	57	60	63	66	69	472	5,014
Convert Medicare to premium support	80	83	87	91	95	99	104	108	114	119	981	4,811
Limit exclusion of employer-sponsored health insurance	100	116	126	136	147	159	172	185	199	213	1,552	9,669
Cut annual non-defense discretionary spending by 5 percent	0	47	49	51	53	55	57	59	61	63	495	2,242
Interaction effects	-1	-1	-6	-6	-7	-6	-7	-7	-9	-9	-59	-917
Total	**179**	**246**	**309**	**328**	**352**	**382**	**417**	**461**	**509**	**559**	**3,742**	**37,936**

Table 12: Economic Effects of Bundle 2, but Social Security retirement age increases and flat monthly benefits start with 62-year-olds in 2025

Percent Change from Baseline unless otherwise indicated

DOWNLOAD DATA

	2030	2035	2040	2045	2050	2054
Gross domestic product	2.3	4.4	6.9	9.8	13.2	16.4
Capital stock	3.9	8.1	13.3	19.6	27.1	34.3
Hours worked	-0.5	0.0	0.5	1.1	1.9	2.7
Average wage	1.3	2.9	4.9	7.2	9.9	12.4
Debt-to-GDP ratio, baseline	111	127	145	167	192	217
Debt-to-GDP ratio, policy bundle	104	111	118	124	127	129

Note: This document will be updated over 2024.

This analysis was produced by Kody Carmody, Jon Huntley, Ed Murphy, Brendan Novak, and Felix Reichling under the direction of Kent Smetters. Alexander Arnon, Sophie Shin, and Aidan O'Connell contributed to the analysis. Mariko Paulson prepared the brief for the website.

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1. That analysis from October 2023 also projected a debt-to-GDP ratio of 188 percent by 2050, which we have recently updated to 192 percent. ↩

2. For more technical readers, the October 2023 analysis reflected inputs from our dynamic "moonshot OLG" model that allows for aggregate uncertainty, thereby allowing the equity premium and risk-free rate to be endogenous, as determined by equilibrium relationships. The resulting state space is about 20,000 times larger than our "core" OLG model. Our "core" OLG model allows, like most OLG models, allows for uninsurable idiosyncratic risk but with deterministic future prices determined by equilibrium conditions. As a result, the "core" model can accommodate a very rich policy space but requires deciding whether (i) the time-varying government's borrowing rate (risk-free rate) is endogenous along with a time-varying but fixed equity premium that is not influenced by policy or (ii) whether the government's time-varying

borrowing rate is fixed along with an endogenous time-varying endogenous equity premium that is influenced by policy. Choice (i) will generally lead to explosive and unsustainable debt paths much earlier than choice (ii). We use choice (ii) in the "core" OLG model, which means that debt only impacts the equity premium with no impact on the government's borrowing rate. We instead forecast the government's borrowing rate using a duration issuance model and market data by duration. Our first decade is very similar to CBO. ↩

3. Model documentation is being prepared and will be released over time. ↩
4. For example, group policies offered by employers cannot individually risk rate. Moreover, the ACA only allows for some pricing difference by age but at a rate increase that is below actuarially fair. ↩
5. CBO's 2017 analysis of such a policy found that it would decrease Medicare outlays by 8 percent and reduce average premiums by 8 percent. ↩
6. This policy was described in greater detail in a 2022 CBO report. ↩