

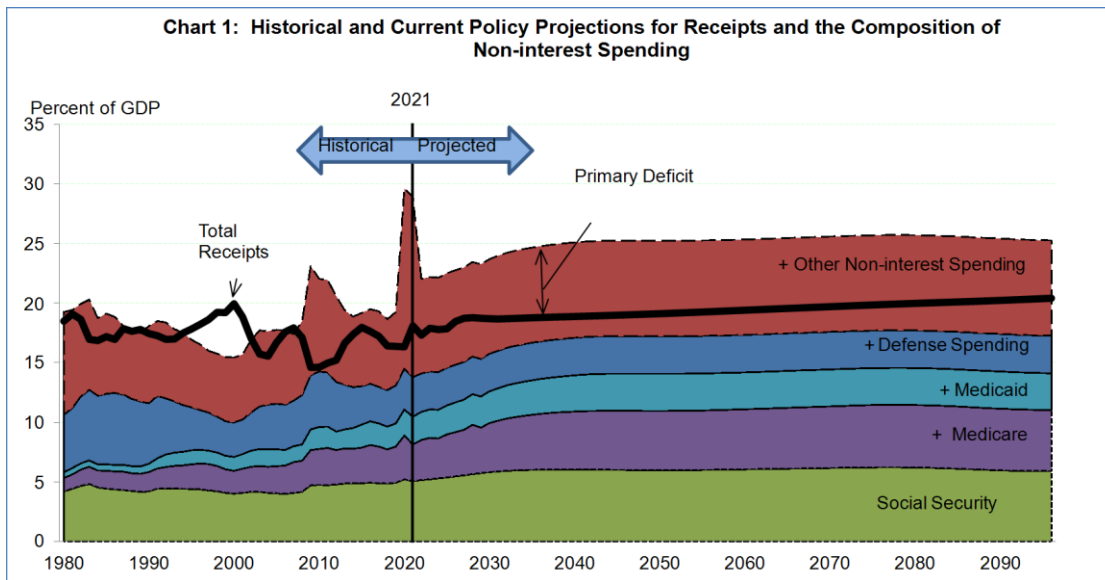
United States Government Required Supplementary Information (Unaudited) For the Fiscal Years Ended September 30, 2021, and 2020

The Sustainability of Fiscal Policy

One of the important purposes of the *Financial Report* is to help citizens and policymakers assess whether current fiscal policy is sustainable and, if it is not, the urgency and magnitude of policy reforms necessary to make fiscal policy sustainable. A sustainable policy is defined as one where the ratio of debt held by the public to GDP (the debt-to-GDP ratio) is ultimately stable or declining.

As discussed below, the projections based on this report’s assumptions indicate that current policy is not sustainable. The debt-to-GDP ratio was approximately 100 percent at the end of 2021, similar to (but slightly below) the ratio at the end of FY 2020. If current policy is left unchanged, the projections show the debt-to-GDP ratio will exceed 200 percent by 2041 and reach 701 percent in 2096. For comparison, under the 2020 projections, the debt-to-GDP ratio exceeded 200 percent in 2042 and reached 623 percent in 2095.

These conclusions are rooted in the projected trends in receipts, spending, and deficits in the context of current law and policy, although, as described in the following pages, there is considerable uncertainty surrounding these projections. The projections are on the basis of policies currently in place and are neither forecasts nor predictions. Changes in policy – including investments in infrastructure efforts to mitigate the impact of climate change and enhancements to caregiving services to build a more resilient and sustainable economy – could have a significant effect on eventual fiscal outcomes.



Current Policy Projections for Primary Deficits

A key determinant of growth in the debt-to-GDP ratio and hence fiscal sustainability is the ratio of the primary deficit-to-GDP. The primary deficit is the difference between non-interest spending and receipts, and the primary deficit-to-GDP ratio is the primary deficit expressed as a percent of GDP. As shown in Chart 1, the primary deficit-to-GDP ratio spiked during 2009 through 2012 due to the 2008-09 financial crisis and the ensuing severe recession, as well as the increased spending and temporary tax reductions enacted to stimulate the economy and support recovery. These elevated primary deficits resulted in a sharp increase in the ratio of debt to GDP, which rose from 39 percent at the end of 2008 to 70 percent at the end of 2012. As an economic recovery took hold, the primary deficit ratio fell, averaging 2.1 percent of GDP over 2013 through 2019. In 2020, the primary deficit-to-GDP ratio rose to 13.3 percent of GDP due to increased spending in response to the COVID-19 pandemic and economic contraction, and the ratio of debt to GDP reached 100 percent at the end of the year. Spending remained elevated in 2021 due to additional funding to support economic recovery, but increased receipts reduced the primary deficit-to-GDP ratio to 10.8 percent.

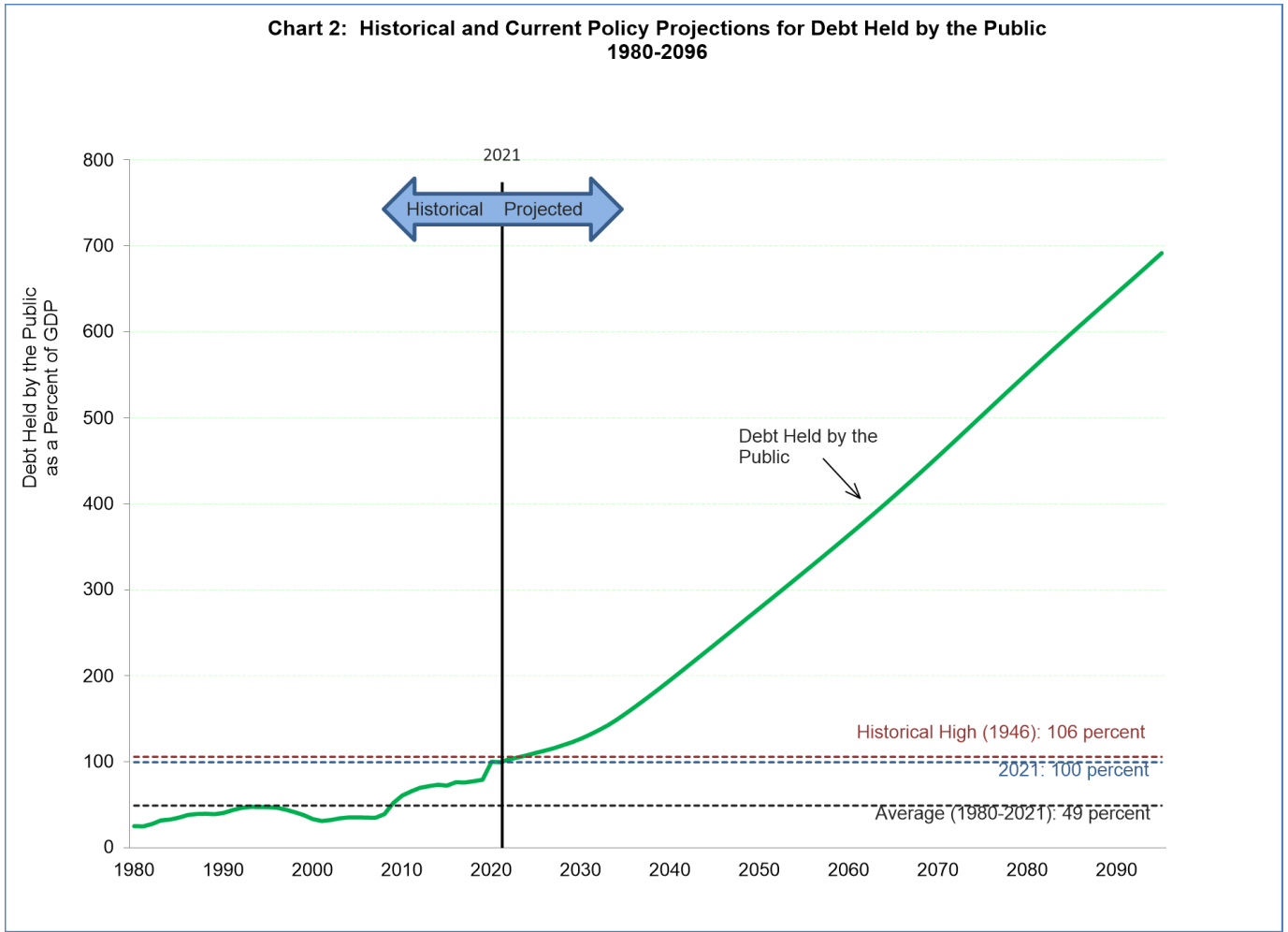
The primary deficit-to-GDP ratio is projected to fall to 4.7 percent in 2022 and then decreases to 4.3 percent in 2027. After 2027, however, increased spending for Social Security and health programs due in part to the continued retirement of the baby boom generation is projected to result in increasing primary deficits that reach 5.0 percent of GDP in 2030. The primary deficit peaks at 6.3 percent of GDP in 2043, then gradually decreases beyond that point as the aging of the population continues at a slower pace, and reaches 4.9 percent in 2096, the last year of the projection period.

Trends in the primary deficit are heavily influenced by tax receipts. The receipt share of GDP was markedly depressed in 2009 through 2012 because of the recession and tax reductions enacted as part of the ARRA and the *Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010*. The share subsequently increased to 18.0 percent of GDP by 2015 before falling below the 30-year average of 17.1 percent in 2018, after enactment of the TCJA. As a share of GDP, receipts were 18.1 percent of GDP in 2021, 1.8 percentage points above 2020. Receipts are projected to decrease to 17.3 percent of GDP in 2022 and then reach 18.7 percent of GDP in 2031 when corporation income tax and other receipts stabilize as a share of GDP. After 2031, receipts grow slightly more rapidly than GDP over the projection period as increases in real (i.e., inflation-adjusted) incomes cause more taxpayers and a larger share of income to fall into the higher individual income tax brackets. Other possible paths for the receipts-to-GDP ratio and the implications for projected debt held by the public are analyzed in the “Alternative Scenarios” section.

On the spending side, the non-interest spending share of GDP was 28.9 percent in 2021, slightly less than the share of GDP in 2020, which was 29.6 percent. The ratio of non-interest spending to GDP is projected to fall to 22.0 percent in 2022 and remain near that level through 2024. After 2024, the non-interest spending share of GDP is projected to rise gradually, reaching 25.7 percent of GDP in 2078, before declining to 25.3 percent in 2096, the end of the projection period. Beginning in 2025, these increases are principally due to faster growth in Medicare and Social Security spending (see Chart 1). The aging of the baby boom generation, among other factors, is projected to increase the Social Security and Medicare spending shares of GDP by about 0.9 percentage points and 1.5 percentage points, respectively, from 2022 to 2041. After 2041, the Social Security and Medicare spending shares of GDP continue to increase in most years, albeit at a slower rate, due to projected increases in health care costs and population aging, before declining toward the end of the projection period.

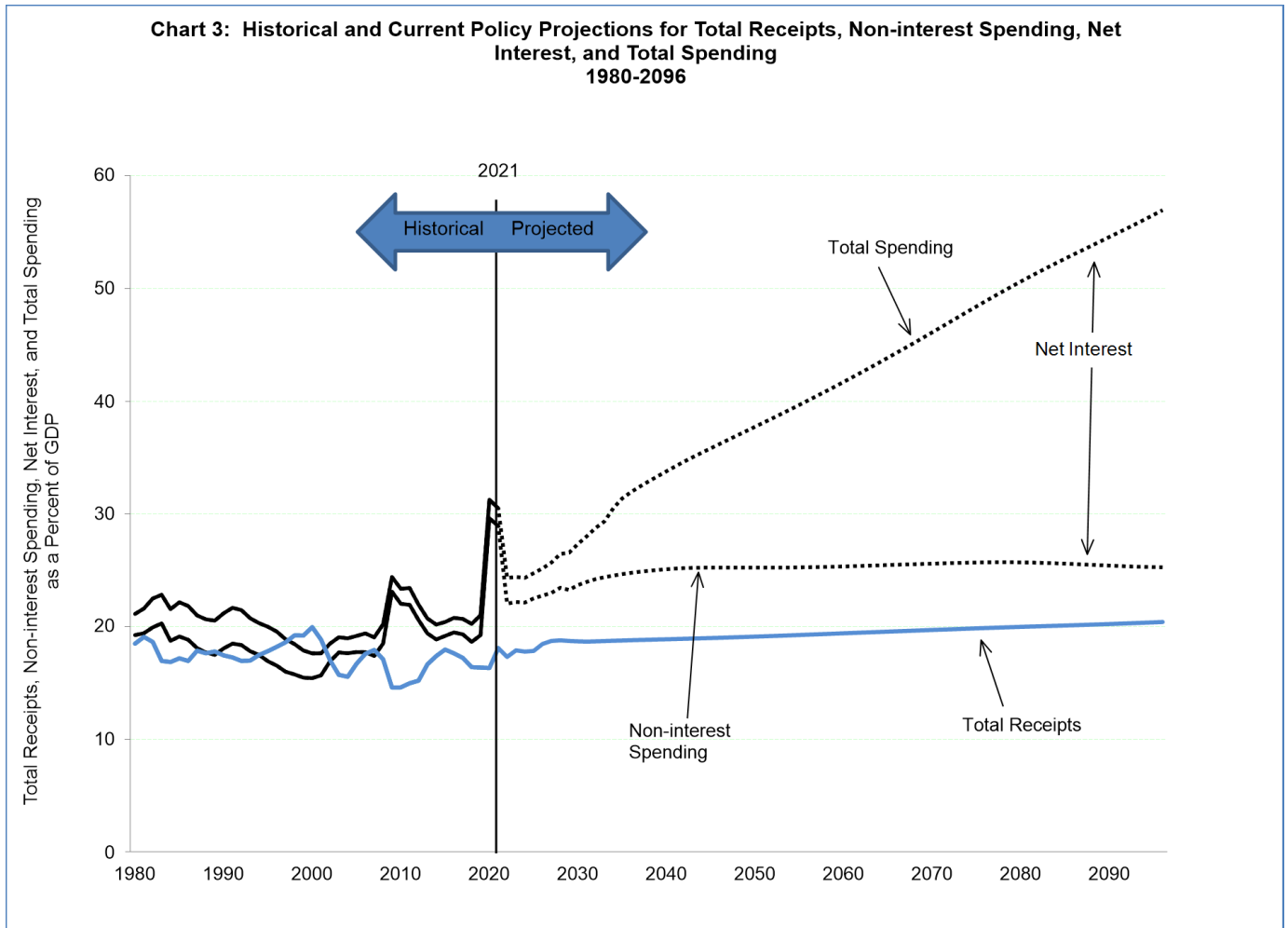
Current Policy Projections for Debt and Interest Payments

The primary deficit projections in Chart 1, along with projections for interest rates and GDP, determine the projections for the debt-to-GDP ratio shown in Chart 2. That ratio was approximately 100 percent at the end of FY 2021, and under current policy and based on this report’s assumptions is projected to reach 701 percent in 2096. The continuous rise of the debt-to-GDP ratio indicates that current policy under this report’s assumptions is unsustainable.



As a general approximation, the change in debt held by the public from one year to the next is the budget deficit, the difference between total receipts and total spending.¹ Total spending is non-interest spending plus interest spending. Chart 3 shows that the rapid rise in total spending and the unified deficit (total receipts less total spending) is almost entirely due to projected net interest, which results from the growing debt. As a percent of GDP, interest spending was 1.6 percent in 2021, and under current policy is projected to reach 5.0 percent in 2033, 15.2 percent in 2057, and 31.7 percent in 2096.

¹ The change in debt each year is also affected by certain transactions not included in the budget deficit, such as changes in Treasury’s cash balances and the non-budgetary activity of federal credit financing accounts. These transactions are assumed to hold constant at about 0.3 percent of GDP each year, with the same effect on debt as if the primary deficit was higher by that amount.



Another way of viewing the change in the financial outlook in this year's report relative to previous years' reports is in terms of the projected debt-to-GDP ratio in 2094, the last year of the 75-year projection period used in the FY 2019 report. This ratio is projected based on this report's assumptions to reach 682 percent in the FY 2021 projections, which compares with 614 percent projected in the FY 2020 projections and 474 percent projected in the FY 2019 projections.²

The Cost of Delay in Closing the 75-Year Fiscal Gap

The longer policy action to close the fiscal gap³ is delayed, the larger the post-reform primary surpluses must be to achieve the target debt-to-GDP ratio at the end of the 75-year period. This can be illustrated by varying the years in which reforms closing the fiscal gap are initiated while holding the target ratio of debt to GDP in 2096 equal to the 2021 ratio. Three timeframes for reforms are considered, each one beginning in a different year, and each one increasing the primary surplus relative to current policy by a fixed percent of GDP starting in the reform year. The analysis shows that the longer policy action is delayed, the larger the post-reform primary surplus must be to bring the debt-to-GDP ratio in 2096 equal to its level in 2021. Future generations are burdened by delays in policy changes because delay necessitates higher primary surpluses during their lifetimes, and those higher primary surpluses must be achieved through some combination of lower spending and higher revenue.

As previously shown in Chart 1, under current policy, primary deficits occur throughout the projection period. Table 1 shows primary surplus changes necessary to make the debt-to-GDP ratio in 2096 equal to its level in 2021 under each of the three timeframes. If reform begins in 2022, then it is sufficient to raise the primary surplus share of GDP by 6.2 percentage

² For additional information on changes from the 2019 projections, see the unaudited RSI in the 2020 *Financial Report*.

³ The fiscal gap reflects how much the primary surplus (receipts less non-interest spending) must increase to maintain the debt-to-GDP ratio at the 2021 level. See Note 26 for a more complete discussion of the fiscal gap.

points in every year between 2022 and 2096 in order for the debt-to-GDP ratio in 2096 to equal its level in 2021. This policy raises the average 2022-2096 primary surplus-to-GDP ratio from -5.7 percent to +0.6 percent.

Table 1 - Cost of Delaying Fiscal Reform

Timing of Reforms	Required Change in Average Primary Surplus
Reform in 2022 (No Delay).....	6.2 percent of GDP between 2022 and 2096
Reform in 2032 (Ten-Year Delay).....	7.3 percent of GDP between 2032 and 2096
Reform in 2042 (Twenty-Year Delay).....	9.0 percent of GDP between 2042 and 2096

Note: Reforms taking place in 2021, 2031, and 2041 from the 2020 Financial Report were 5.4, 6.4, and 7.8 percent of GDP, respectively.

In contrast to a reform that begins immediately, if reform begins in 2032 or 2042, then the primary surpluses must be raised by 7.3 percent and 9.0 percent of GDP, respectively, in order for the debt-to-GDP ratio in 2096 to equal its level at the end of 2021. The difference between the primary surplus increase necessary if reform begins in 2032 or 2042 and the increase necessary if reform begins in 2022, an additional 1.1 and 2.7 percentage points, respectively, is a measure of the additional burden policy delay would impose on future generations. The costs of delay are due to the additional debt that accumulates between the end of 2021 and the year reform is initiated, in comparison to the scenario in which reform begins immediately.

Alternative Scenarios

The long-run projections are highly uncertain. The uncertainty in this year’s projections is further increased by the COVID-19 pandemic. This section illustrates this inherent uncertainty by presenting alternative scenarios for the growth rate of health care costs, interest rates, discretionary spending, and receipts. (Not considered here are the effects of alternative assumptions for long-run trends in birth rates, mortality, and immigration.)

The population is aging rapidly and will continue to do so over the next several decades, which puts pressure on programs such as Social Security, Medicare, and Medicaid. A shift in projected fertility, mortality, or immigration rates could have important effects on the long-run projections. Higher-than-projected immigration, fertility, or mortality rates would improve the long-term fiscal outlook. Conversely, lower-than-projected immigration, fertility, or mortality rates would result in deterioration in the long-term fiscal outlook.

Effect of Changes in Health Care Cost Growth

One of the most important assumptions underlying the projections is the future growth of health care costs. These future growth rates – both for health care costs in the economy generally and for federal health care programs such as Medicare, Medicaid, and PPACA exchange subsidies – are highly uncertain. In particular, PPACA in 2010 and MACRA in 2015 lowered payment rates for Medicare hospital and physician payments. The Medicare spending projections in the long-term fiscal projections are based on the projections in the 2021 Medicare Trustees’ Report, which assume the PPACA and MACRA payment rates will be effective in producing a substantial slowdown in Medicare input cost growth. As discussed in Note 25—Social Insurance, the Medicare projections are subject to much uncertainty about the ultimate effects of these provisions to reduce health care cost growth. For the long-term fiscal projections, that uncertainty also affects the projections for Medicaid and exchange subsidies, because the cost per beneficiary in these programs grows at the same reduced rate as Medicare cost growth per beneficiary.

As an illustration of the dramatic effect of variations in health care cost growth rates, Table 2 shows the effect on the size of reforms necessary to close the fiscal gap of per capita health care cost growth rates that are one percentage point higher or two percentage points higher than the growth rates in the base projection, as well as the effect of delaying closure of the fiscal gap.⁴ As indicated earlier, if reform is initiated in 2022, eliminating the fiscal gap requires that the 2022-2096

⁴ The base case health cost growth rates are derived from the projections in the 2021 Medicare Trustees’ Report. These projections are summarized and discussed in Note 25 and the “Medicare Projections” section of the unaudited RSI for the SOSI.

primary surplus increase by an average of 6.2 percent of GDP in the base case. However, that figure increases to 10.1 percent of GDP if per capita health cost growth is assumed to be 1.0 percentage point higher, and 16.7 percent of GDP if per capita health cost growth is 2.0 percentage points higher. The cost of delaying reform is also increased if health care cost growth is higher because debt accumulates more rapidly during the period of inaction. For example, the lower part of Table 2 shows that delaying reform initiation from 2022 to 2032 requires that 2032-2096 primary surpluses be higher by an average of 1.1 percent of GDP in the base case, 1.7 percent of GDP if per capita health cost growth is 1.0 percentage point higher, and 2.9 percent of GDP if per capita health cost growth is 2.0 percentage points higher. The dramatic deterioration of the long-run fiscal outlook caused by higher health care cost growth shows the critical importance of managing health care cost growth.

Scenario	Primary Surplus Increase (% of GDP) Starting in:		
	2022	2032	2042
Base Case.....	6.2	7.3	9.0
1.0 p.p. higher per capita health cost growth.....	10.1	11.9	14.5
2.0 p.p. higher per capita health cost growth.....	16.7	19.6	24.0
	Change in Primary Surplus Increase if Reform is Delayed From 2022 to:		
		2032	2042
Base Case.....		1.1	2.7
1.0 p.p. higher per capita health cost growth.....		1.7	4.4
2.0 p.p. higher per capita health cost growth.....		2.9	7.3

Note: Increments may not equal the subtracted difference of the components due to rounding. "p.p." means percentage point(s).

Effects of Changes in Interest Rates

A higher debt-to-GDP ratio is likely to increase the interest rate on government debt, making it costlier for the government to service its debt than if the debt-to-GDP ratio were lower. Table 3 displays the effect of several alternative scenarios using different nominal (and real) interest rates than assumed in the base case on the size of reforms to close the fiscal gap as well as the effect of delaying closure of the fiscal gap. If reform is initiated in 2022, eliminating the fiscal gap requires that the 2022-2096 primary surplus increase by an average of 6.2 percent of GDP in the base case, 7.8 percent of GDP if the interest rate is 2.0 percentage points higher in every year, and 7.1 percent of GDP if the interest rate is 1.0 percentage point higher in every year. The required increase in the 2022-2096 primary surplus decreases to an average of 5.4 percent of GDP if the interest rate is 1.0 percentage point lower in every year and 4.5 percent of GDP if the interest rate is 2.0 percentage points lower in every year. The cost of delaying reform is also increased if interest rates are higher, due to the fact that interest paid on debt accumulates more rapidly during the period of inaction. For example, the lower part of Table 3 shows that delaying reform initiation from 2022 to 2032 requires that 2032-2096 primary surpluses be higher by an average of 1.1 percent of GDP in the base case, 2.5 percent of GDP if the interest rate is 2.0 percentage points higher in every year, and 1.7 percent of GDP if the interest rate is 1.0 percentage point higher in every year. The required increase in the 2032-2096 primary surplus is higher by an average of 0.7 percent of GDP if the interest rate is 1.0 percentage point lower in every year and 0.4 percent of GDP if the interest rate is 2.0 percentage points lower in every year.

Table 3 - Impact of Alternative Interest Rate Scenarios on Cost of Delaying Fiscal Reform

Scenario	Primary Surplus Increase (% of GDP) Starting in:		
	2022	2032	2042
Base Case: Average of 4.4 percent over 75 years.....	6.2	7.3	9.0
2.0 p.p. higher interest rate in each year.....	7.8	10.3	14.3
1.0 p.p. higher interest rate in each year.....	7.1	8.7	11.3
1.0 p.p. lower interest rate in each year.....	5.4	6.0	7.0
2.0 p.p. lower interest rate in each year.....	4.5	4.9	5.4
		Change in Primary Surplus Increase if Reform is Delayed From 2022 to:	
		2032	2042
Base Case: Average of 4.4 percent over 75 years.....		1.1	2.7
2.0 p.p. higher interest rate in each year.....		2.5	6.4
1.0 p.p. higher interest rate in each year.....		1.7	4.3
1.0 p.p. lower interest rate in each year.....		0.7	1.6
2.0 p.p. lower interest rate in each year.....		0.4	0.9

Note: Increments may not equal the subtracted difference of the components due to rounding.

Effects of Changes in Discretionary Spending Growth

The rate of growth of discretionary spending has a large impact on long-term fiscal sustainability. The current base projection for discretionary spending assumes that spending in 2022 equals the baseline estimate from the President’s FY 2022 Budget and then grows with nominal GDP. Under the base projection, discretionary spending is approximately 7.1 percent of GDP each year over the projection period. The implications of an alternative scenario are shown in Table 4. In the alternative scenario, discretionary spending for 2022 is the same as in the base case and then grows with inflation and population so as to hold discretionary spending constant on a real per capita basis. (This growth rate assumption is slower than growth with GDP but is still higher than the standard 10-year budget baseline assumption, which assumes that discretionary spending grows with inflation but not with population.) As shown in Table 4, if discretionary spending grows with nominal GDP, eliminating the fiscal gap requires that the 2022-2096 primary surplus increase by an average of 6.2 percent of GDP. If discretionary spending grows with inflation and population, the fiscal gap is 3.6 percent of GDP. The cost of delaying reform is greater when discretionary spending levels are higher. Initiating reforms in 2032 requires that the primary surplus increase by an average of 1.1 percent of GDP per year in the base case and by an average of 0.6 percent of GDP if discretionary levels grow with inflation and population after 2022. If delayed until 2042, the primary surplus must increase by an average of 2.7 percent of GDP in the base case and by an average of 1.6 percent of GDP when spending grows with inflation and population.

Table 4 - Impact of Alternative Discretionary Spending Growth Scenarios on Cost of Delaying Fiscal Reform

Scenario	Primary Surplus Increase (% of GDP) Starting in:		
	2022	2032	2042
Base Case: Growth with GDP.....	6.2	7.3	9.0
Growth with inflation and population.....	3.6	4.2	5.2
		Change in Primary Surplus Increase if Reform is Delayed From 2022 to:	
		2032	2042
Base Case: Growth with GDP.....		1.1	2.7
Growth with inflation and population.....		0.6	1.6

Note: Increments may not equal the subtracted difference of the components due to rounding.

Effects of Changes in Individual Income Receipt Growth

The growth rate of receipts, specifically individual income taxes, is another key determinant of long-term sustainability. The base projections assume growth in individual income taxes over time to account primarily for the slow shift of individuals into higher tax brackets due to real wage growth (“real bracket creep”). This assumption approximates the long-term historical growth in individual income taxes relative to wages and salaries and is consistent with current policy without change, as future legislation would be required to prevent real bracket creep. As an illustration of the effect of variations in individual income tax growth, Table 5 shows the effect on the size of reforms necessary to close the fiscal gap and the effect of delaying closure of the fiscal gap if long-term receipt growth as a share of wages and salaries is 0.1 percentage point higher than the base case, as well as 0.1 percentage point lower than the base case. If reform is initiated in 2022, eliminating the fiscal gap requires that the 2022-2096 primary surplus increase by an average of 6.2 percent of GDP in the base case, 5.1 percent of GDP if receipt growth is 0.1 percentage point higher, and 7.4 percent of GDP if receipt growth is 0.1 percentage point lower. The cost of delaying reform is also affected if receipt growth assumptions change, much as was the case in the previous alternative scenarios.

Table 5 - Impact of Alternative Revenue Growth Scenarios on Cost of Delaying Fiscal Reform

Scenario	Primary Surplus Increase (% of GDP) Starting in:		
	2022	2032	2042
Base Case: Individual income tax bracket creep of 0.1% of wages and salaries per year	6.2	7.3	9.0
0.2% of wages and salaries per year after 2031	5.1	6.0	7.3
0.0% of wages and salaries per year after 2031 (no bracket creep)	7.4	8.6	10.6
	Change in Primary Surplus Increase if Reform is Delayed From 2022 to:		
	2032	2042	
Base Case: Individual income tax bracket creep of 0.1% of wages and salaries per year		1.1	2.7
0.2% of wages and salaries per year after 2031		0.9	2.2
0.0% of wages and salaries per year after 2031 (no bracket creep)		1.3	3.2

Note: Increments may not equal the subtracted difference of the components due to rounding.

Fiscal Projections in Context

In this report, a sustainable fiscal policy has been defined as one where the federal debt-to-GDP ratio is stable or declining over the projection period. However, this definition does not indicate what a sustainable debt-to-GDP ratio might be. Any particular debt ratio is not the ultimate goal of fiscal policy. Rather, the goals of fiscal policy are many. They include financing public goods, such as infrastructure and government services; promoting a strong and growing economy; and managing the debt so that it is not a burden on future generations. These goals are interrelated, and readers should consider how policies intended to affect one might depend on or affect another.

This report shows that current policy under this report's assumptions is not sustainable. In evaluating policies that could make policy sustainable, note that debt may play roles in both facilitating and hindering a healthy economy. For example, government deficit spending supports demand and allows economies to emerge from recessions more quickly. Debt may also be a cost-effective means of financing capital investment that promotes future economic growth, which may in turn make future debt levels more manageable. However, economic theory also suggests that high levels of debt may contribute to higher interest rates, leading to lower private investment and a smaller capital stock which the economy can use to grow. Unfortunately, it is unclear what debt-to-GDP ratio would be sufficiently high to produce these negative outcomes, or whether the key concern is the level of debt per se, or a trend that shows debt increasing over time.

While several empirical studies have attempted to discern a definite relationship between debt and economic growth from the past experience of countries, the evidence is mixed. One study suggested that as advanced countries' debt-to-GDP ratios exceeded 90 percent it had significant negative consequences for real GDP growth.⁵ Real GDP growth is generally lower by about 1 percent when the countries' debt-to-GDP ratios are above 90 percent relative to the times when they are

⁵ Reinhart, Carmen M., Vincent R. Reinhart and Kenneth S. Rogoff. 2012. "Public Debt Overhangs: Advanced-Economy Episodes Since 1800." *Journal of Economic Perspectives*, 26(3):69.86.

below 90 percent.⁶ However, after removing sample countries with very high indebtedness – those with debt-to-GDP ratios of more than 120 percent – and very low indebtedness – those with debt-to-GDP ratios of less than 30 percent – the negative relationship between growth and debt is difficult to determine. Another study reports that differences in average GDP growth in countries with debt-to-GDP ratios between 30-60 percent, 60-90 percent, and 90-120 percent cannot be statistically distinguished.⁷ Some countries with high debt-to-GDP ratios have been observed to experience lower-than-average growth, while other countries with similarly high debt ratios have continued to enjoy robust growth. Analogously, low debt-to-GDP ratios are no guarantee of strong economic growth. Moreover, the direction of causality is unclear. High debt may undermine growth through increased interest rates and lower business confidence, or low growth may contribute to high debt by depressed tax revenues and increased deficit spending on social safety net programs.

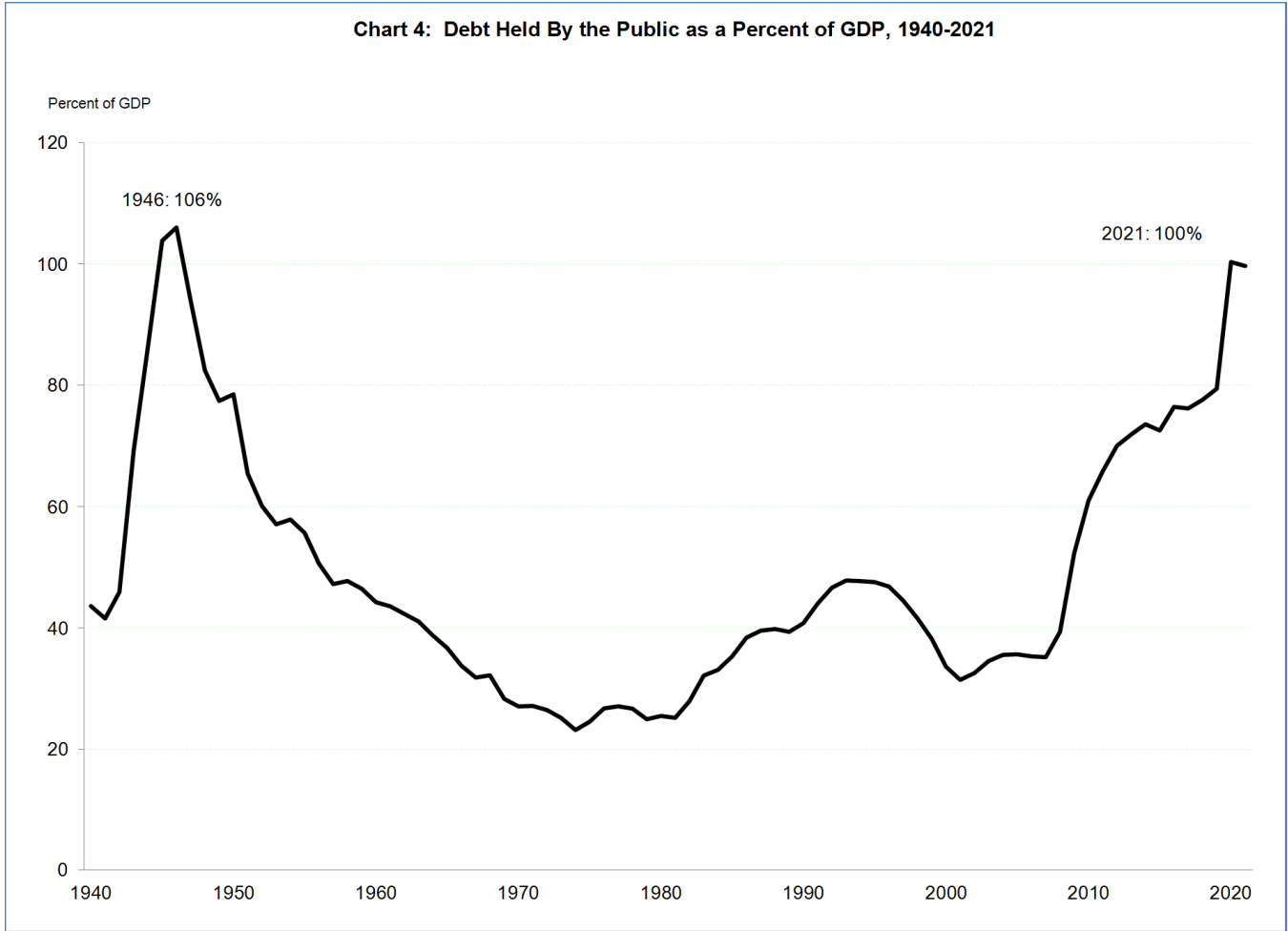
Nevertheless, to put the current and projected debt-to-GDP ratios in context, it is instructive to examine how the U.S. experience compares with that of other countries. The U.S. government's debt as a percent of GDP is relatively large compared with central government debt of other countries, but far from the largest among developed countries. Based on historical data as reported by the IMF for 29 advanced economies, the debt-to-GDP ratio in 2019 ranged from 5.8 percent of GDP to 196.4 percent of GDP.⁸ The U.S. is not included in this set of statistics, which underscores the difficulty in calculating debt ratios under consistent definitions, but the 2021 debt-to-GDP ratio for the U.S. government was approximately 100 percent. Despite using consistent definitions where available, these debt measures are not strictly comparable due to differences in the share of government debt that is debt of the central government, how government responsibilities are shared between central and local governments, how current policies compare with the past policies that determine the current level of debt, and how robustly each economy grows.

The historical experience of the U.S. may also provide some perspective. As Chart 4 shows, the debt-to-GDP ratio was highest in the 1940s, following the debt buildup during World War II. In the projections in this report, the U.S. would reach the previous peak debt ratio in 2024. However, the origins of current and future federal debt are quite different from the wartime debt of the 1940s, which limits the pertinence of past experience.

⁶ Errata: "Growth in a Time of Debt," Carmen M. Reinhart and Kenneth S. Rogoff. Harvard University, 2013.

⁷ Herndon, Thomas, Michael Ash, and Robert Pollard, "Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff," *Cambridge Journal of Economics*, 2013.

⁸ Government Finance Statistics Yearbook, Main Aggregates and Balances, available at <https://data.imf.org>. Data is for D1 debt liabilities for the central government, excluding social security funds, for Advanced Economies.



As the cross-country and historical comparisons suggest, there is a very imperfect relationship between the current level of central government debt and the sustainability of overall government policy. Past accrual of debt is certainly important, but current policies and their implications for future debt accumulation are as well.

Conclusion

The projections in this *Financial Report* indicate that if policy remains unchanged, the debt-to-GDP ratio will steadily increase throughout the projection period and beyond, which implies current policy under this report’s assumptions is not sustainable and must ultimately change. Subject to the important caveat that policy changes are not so abrupt that they slow economic growth, the sooner policies are put in place to avert these trends, the smaller are the adjustments necessary to return the nation to a sustainable fiscal path, and the lower the burden of the debt will be to future generations.

Social Insurance

The social insurance programs consisting of Social Security, Medicare, Railroad Retirement, Black Lung, and UI were developed to provide income security and health care coverage to citizens under specific circumstances as a responsibility of the government. Because taxpayers rely on these programs in their long-term planning, social insurance program information should indicate whether the current statutory provisions of the programs can be sustained, and more generally what effect these provisions likely have on the government's financial condition. The resources needed to run these programs are raised through taxes and fees. Eligibility for benefits depends in part on earnings and time worked by the individuals. Social Security benefits are generally redistributed intentionally toward lower-wage workers (i.e., benefits are progressive). In addition, each social insurance program has a uniform set of eligibility events and schedules that apply to all participants.

RSI material is generally drawn from the 2021 Annual Reports of the Boards of Trustees, which represents the official government evaluation of the financial and actuarial status of the Social Security and Medicare Trust Funds. Unless otherwise noted, all data are for calendar years, all projections are based on current law and the Trustees intermediate set of assumptions. The one exception is that the projections disregard benefit payment reductions that would result from the projected depletion of the OASDI and HI Trust Funds. Under current law, benefit payments would be reduced to levels that could be covered by incoming tax and premium revenues when the trust fund balances have been depleted.

Social Security and Medicare

Social Security

The OASI and DI Trust Funds were established on January 1, 1940 and August 1, 1956 respectively as separate accounts in Treasury. The OASI fund pays cash retirement benefits to eligible retirees and their eligible dependents and survivors, and the much smaller DI fund pays cash benefits to eligible individuals who are unable to work because of medical conditions and certain family members of such eligible individuals. All financial operations of the OASI and DI Programs are handled through these respective funds. The two funds are often referred to as the combined OASDI Trust Funds or "Social Security." At the end of calendar year 2020, Social Security benefits were paid to approximately 65 million beneficiaries.

The events that trigger benefit payments are quite different however, both trust funds have the same dedicated financing structure: taxes paid by workers, their employers, and individuals with self-employment income, based on work covered by the Social Security Program. Currently, employers and employees each pay 6.2 percent of taxable earnings, and the self-employed pay 12.4 percent of taxable earnings. Payroll taxes are levied on wages and net earnings from self-employment up to a specified maximum annual amount, referred to as maximum taxable earnings (\$142,800.00 in 2021), that increases each year with economy-wide average wages.

Legislation passed in 1984 subjected up to half of Social Security benefits to income tax and allocated the revenue to the OASDI Trust Funds. In 1993 legislation increased the potentially taxed portion of benefits to 85.0 percent and allocated the additional revenue to the Medicare's HI Trust Fund.

Medicare

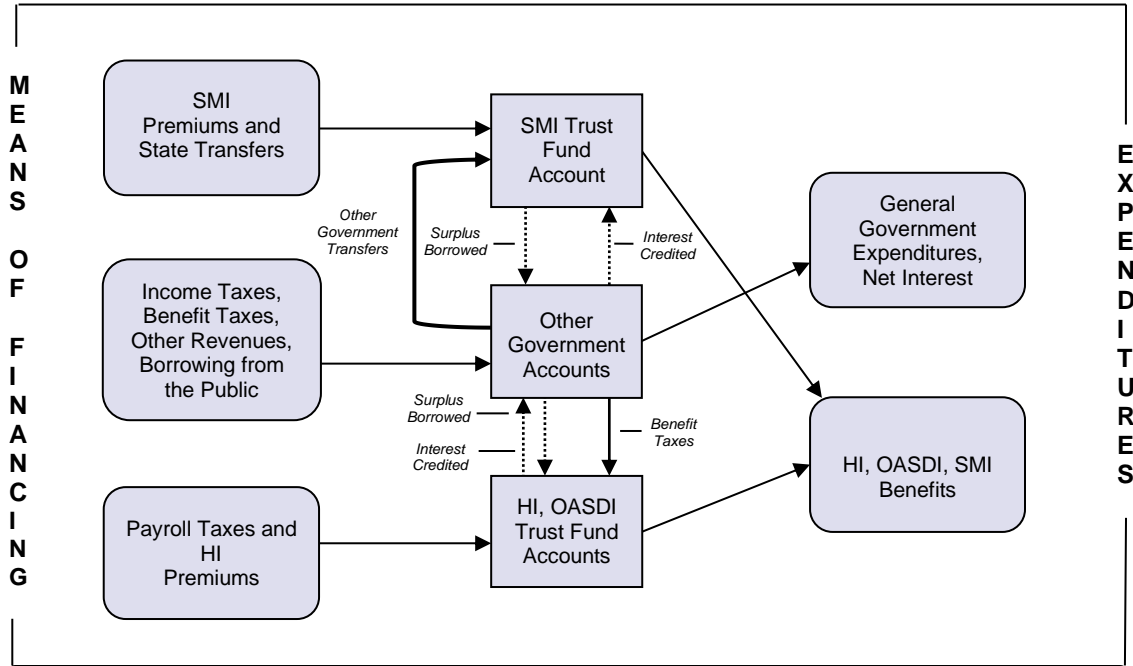
The Medicare Program, created in 1965, has two separate trust funds: the HI Trust Fund (otherwise known as Medicare Part A) and the SMI Trust Funds (which consists of the Medicare Part B and Part D⁹ accounts). HI helps pay for inpatient hospital skilled nursing facility, home health, and hospice. SMI helps pay for hospital outpatient services, physician services, and assorted other services and products through Part B and for prescription drugs through Part D.

Though the events that trigger benefit payments are similar, HI and SMI have different dedicated financing structures. Similar to Social Security, HI is financed primarily by payroll contributions. Currently, employers and employees each pay 1.45 percent of earnings, while self-employed workers pay 2.9 percent of their net earnings. SMI is financed primarily by direct transfers from the General Fund. Additional financing sources include premiums paid by beneficiaries and, for Part D state transfers.

⁹ Medicare legislation in 2003 created the new Part D account in the Medicare Part B and D Trust Fund to track the finances of a new prescription drug benefit that began in 2006. As is the case for Medicare Part B, a little less than three-quarters of revenues to the Part D account will come from future transfers from the General Fund. Consequently, the nature of the relationship between the Medicare Part B and D Trust Fund and the federal budget described below is largely unaffected by the presence of the Part D account though the magnitude will be greater.

Social Security, Medicare, and Government-wide Finances

Figure 1—Social Security, Medicare, and Government-wide Finances



- Other Government Transfers: Intra-governmental transfers to the Medicare “Parts B and D” Trust Fund from other government accounts.
- Surplus Borrowed: Program revenue loaned to the General Fund and treated as if it borrowed the money from the public
- Interest Credited: Interest earned when the excess of program revenue over expenses is loaned to the General Fund becoming a future obligation to the General Fund.

The current and future financial status of the separate Social Security and Medicare Trust Funds is the focus of the Social Security and Medicare Trustees’ Reports, a focus that may appropriately be referred to as the “trust fund perspective.” In contrast, the government primarily uses the budget concept, appropriately referred to as the “budget perspective” or the “government-wide perspective” as the framework for budgetary analysis and presentation. It represents a comprehensive display of all federal activities, regardless of fund type or on- and off-budget status and has a broader focus than the trust fund perspective. Social Security and Medicare are among the largest expenditure categories of the U.S. federal budget. This section describes the important relationship between the trust fund perspective and the government-wide perspective.

Figure 1 is a simplified depiction of the interaction of the Social Security and Medicare Trust Funds with the rest of the federal budget.¹⁰ The boxes on the left show sources of funding, those in the middle represent the trust funds and other government accounts, including the General Fund into which that funding flows, and the boxes on the right show simplified expenditure categories. The figure is intended to illustrate how the various sources of program revenue flow through the budget to beneficiaries. The general approach is to group revenues and expenditures that are linked specifically to Social Security and/or Medicare separately from those for other government programs.

Each of the trust funds has its own sources and types of revenue. With the exception of General Fund transfers to Medicare Parts B and D, each of these revenue sources represents revenue from the public that is dedicated specifically for the respective trust fund and cannot be used for other purposes. In contrast, personal and corporate income taxes as well as other revenue go into General Fund and are drawn down for any government program for which Congress has approved spending.¹¹ The Medicare SMI Trust Fund is shown separately from the Social Security OASDI Trust Funds and the Medicare HI Trust Fund to highlight the unique financing of Medicare Parts B and D. Currently, it is the only one of the programs that is funded through transfers from the General Fund. The transfers are automatic and; their size depends on

¹⁰ The federal budget encompasses all government financing and is synonymous with a government-wide perspective.

¹¹ Other programs also have dedicated revenues in the form of taxes and fees (and other forms of receipt) and there are a large number of dedicated trust funds in the federal budget.

program expenses, not on how much revenue comes into Treasury. If General Fund revenues become insufficient to cover both the mandated transfer to Medicare Parts B and D and expenditures on other general government programs, Treasury needs to borrow to make up the difference. In the longer run, if transfers to Medicare Parts B and D increase beyond growth in general revenues as projected, then Congress must either raise taxes, cut other government spending, reduce Medicare Parts B and D benefits, or borrow even more.

Intra-governmental transfers (surplus) is a form of “borrowing/lending” between the government accounts. How loans from the trust funds to the General Fund and later repayments of those loans affect tax income and expenditures of the General Fund is uncertain. Two extreme cases encompass the possibilities. At one extreme, each dollar the trust funds loan to the General Fund might reduce borrowing from the public by a dollar at the time the loan is extended, in which case the General Fund could repay all trust fund loans by borrowing from the public without raising the level of public debt above the level that would have occurred in the absence of the loans. At the other extreme, the trust fund loans result in additional largess (i.e., higher spending and/or lower taxes) in General Fund programs at the time the loans are extended, but ultimately that additional largess is financed with additional austerity (i.e., lower spending and/or higher taxes). The actual impact of trust fund loans to the General Fund and their repayment on General Fund programs is at one of these two extremes or somewhere in between.

Actual dollar amounts roughly corresponding to the flows presented in Figure 1 are shown in the following table for FY 2021. From the government-wide perspective, only revenues received from the public and state transfers less expenditures made to the public are important for the final balance. From the trust fund perspective which is captured in the bottom section of each of the three trust fund columns, revenue also includes amounts transferred from the General Fund and interest earned from the lending/borrowing activity between the General Fund and the trust funds. Transfers to the SMI Program from the General Fund are obligated under current law and therefore, appropriately viewed as revenue from the trust fund perspective.

Revenues and Expenditures for Medicare and Social Security Trust Funds and the Total Federal Budget for the Fiscal Year ended September 30, 2021						
	Trust Funds					
(In billions of dollars)	HI	SMI	OASDI	Total	All Other	Total¹
Payroll taxes and other public revenues:						
Payroll and benefit taxes	324.1	-	1,007.1	1,331.2	-	1,331.2
Premiums.....	5.7	129.7	-	135.4	-	135.4
Other taxes and fees.....	-	14.6	-	14.6	2,564.8	2,579.4
Total	329.8	144.3	1,007.1	1,481.2	2,564.8	4,046.0
Total expenditures to the public ²	331.9	510.8	1,134.8	1,977.5	4,840.7	6,818.2
Net results for budget perspective³	(2.1)	(366.5)	(127.7)	(496.3)	(2,275.9)	(2,772.2)
Revenues from other government accounts:						
Transfers	1.4	448.2	-	449.6	(449.6)	
Interest credits.....	2.4	2.1	73.3	77.8	(77.8)	
Total	3.8	450.3	73.3	527.4	(527.4)	
Net results for trust fund perspective³.....	1.7	83.8	(54.4)	31.1	N/A	N/A

¹ This column is the sum of the preceding two columns and shows data for the total federal budget. The figure \$2,772.2 billion was the total federal deficit in FY 2021.

² The OASDI figure includes \$4.9 billion transferred to the RRB for benefit program payments and is therefore an expenditure to the public.

³ Net results are computed as revenues less expenditures.

Transfers and interest credits received by the trust funds appear as a negative entry under “all other” and column is offset when summed for the total budget.

Note: "N/A" indicates not applicable.

Medicare Part A: Government-wide perspective-difference between expenditures made to the public and revenues was \$2.1 billion. Trust fund perspective-after revenues from transfers and interest from the General Fund, revenues exceeded expenditures by \$1.7 billion.

Medicare Parts B and D: Government-wide perspective-difference between expenditures made to the public and revenues was \$366.5 billion resulting in a net draw on the overall budget balance. Trust fund perspective-after revenues from transfers and interest from the General Fund, revenues exceeded expenditures by \$83.8 billion.

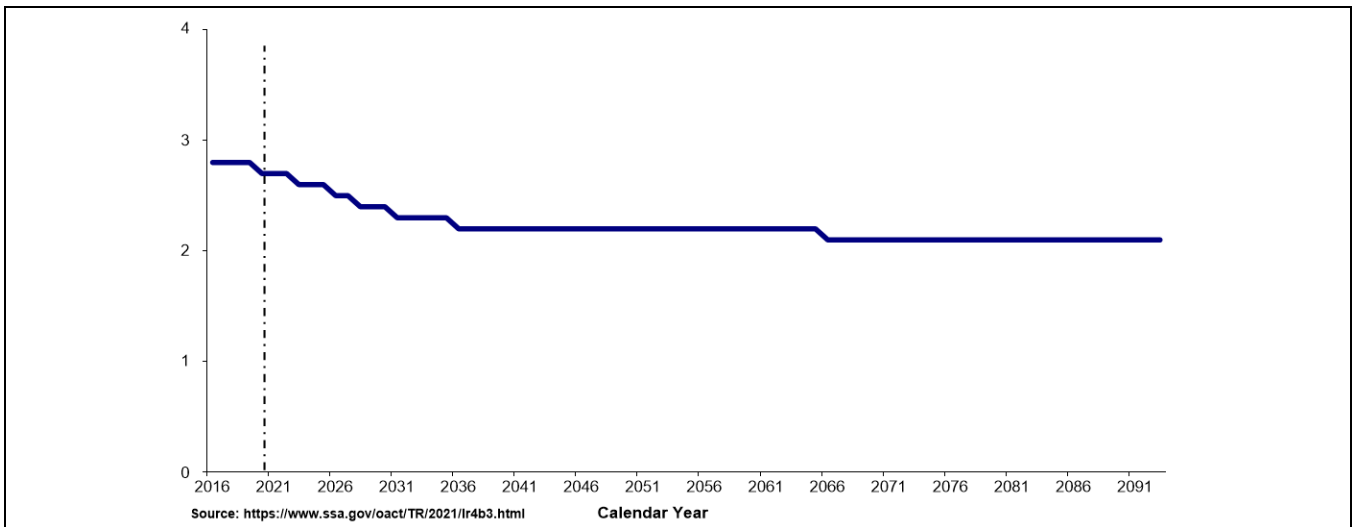
Social Security: Government-wide perspective-difference made to the public and revenues was \$127.7 billion. Trust fund perspective-after revenues from transfers and interest from the General Fund, expenditures exceeded revenues by \$54.4 billion.

Cash Flow Projections

Economic and Demographic Assumptions. The Boards of Trustees of the OASDI and Medicare Trust Funds provide in their annual reports to Congress short-range (10-year) and long-range (75-year) actuarial estimates of each trust fund. Because of their inherent uncertainty in estimating 75 years into the future, the boards use three alternative sets of economic and demographic assumptions to show a range of possibilities. The economic and demographic assumptions used for the most recent set of intermediate projections for Social Security and Medicare are shown in the demographic and economic assumption section of Note 25—Social Insurance.

Worker-to-Beneficiary Ratio. For the most part, current workers’ pay for current benefits. The relatively smaller number of persons born after the Baby Boom will therefore finance the retirement of the Baby Boom generation. Chart 1 shows the estimated number of covered workers per OASDI beneficiary using the Trustees intermediate assumptions. Covered workers are persons having earnings creditable for OASDI purposes based on wages in covered employment or income from covered self-employment. The estimated number of workers per beneficiary declines from 2.7 in 2020 to 2.1 in 2095. A similar demographic pattern confronts the Medicare Program. In 2020 every HI beneficiary had about 2.9 workers to pay for his or her benefit and continues to decline until there are only 2.2 workers per beneficiary by 2095.

**Chart 1—Number of Covered Workers per OASDI Beneficiary
2016-2095**



Social Security Projections

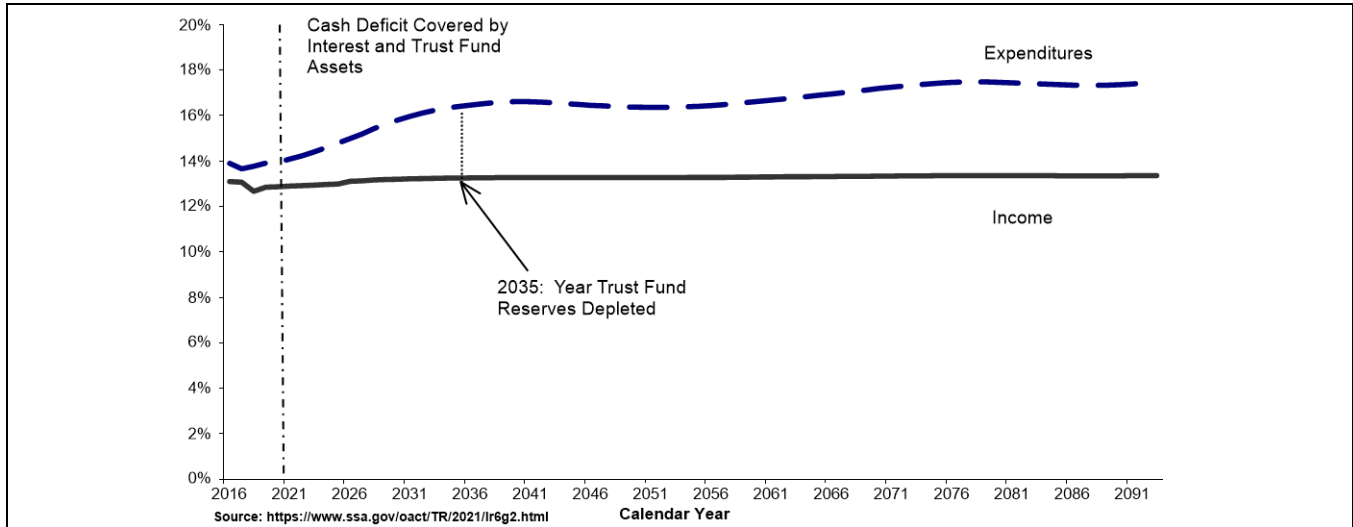
Income and Expenditures as a Percent of Taxable Payroll. Chart 2 shows annual non-interest income and expenditures expressed as percentages of taxable payroll. Estimated cost started to exceed income including interest in 2021. Estimated cost, expressed as a percentage of taxable payroll, increases through about 2078 and then slightly declines through the end of the 75-year period. The estimated income at the end of the 75-year period is sufficient to cover 74.0 percent of the estimated cost.

In any year, to meet all OASDI cost on a timely basis, the combined OASI and DI Trust Funds will need to redeem Treasury securities. This redemption differs from the situation of prior years when the combined OASI and DI Trust Funds

had been net lenders to the General Fund. Because the program lacks the authority to borrow to continue paying benefits, benefit payments would be limited to the available noninterest income.

Solvency could be achieved by: 1) increasing revenue equivalent to an immediate and permanent payroll tax rate increase of 3.36 percent points; or by 2) reducing scheduled benefits by an amount equivalent to an immediate and permanent reduction of about 21.0 percent applied to all current and future beneficiaries, or about 25.0 percent if the reductions were applied only to newly entitled beneficiaries. Alternatively, some combination of tax increases and benefit reductions could be adopted.

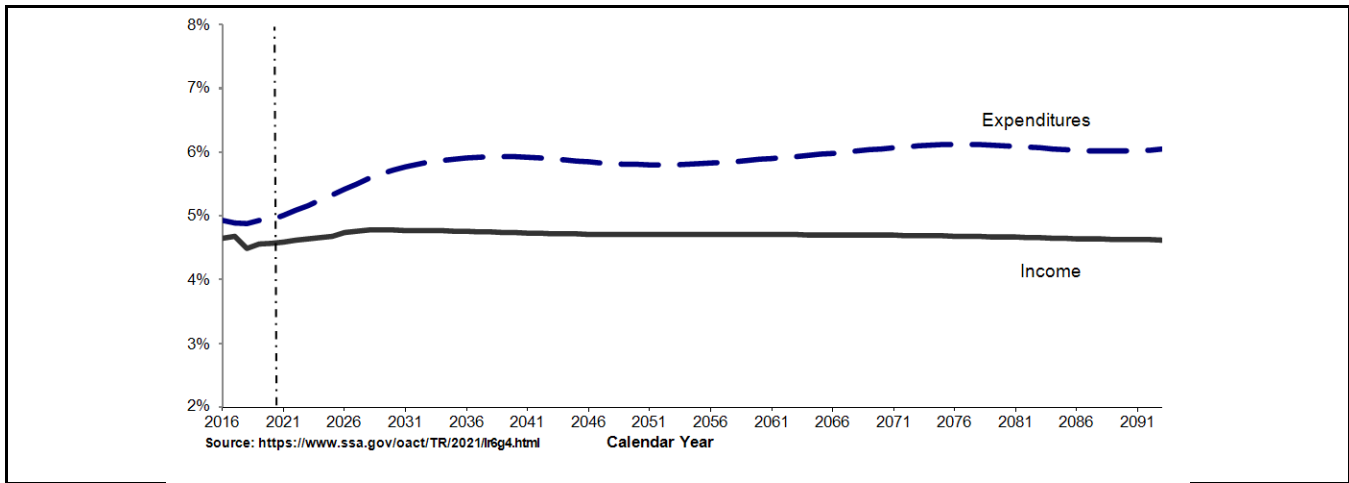
**Chart 2—OASDI Income (Excluding Interest) and Expenditures
as a Percent of Taxable Payroll
2016-2095**



Income and Expenditures as a Percent of GDP. Chart 3 shows estimated annual non-interest income and expenditures, expressed as a percent of GDP. Analyzing these cash flows in terms of percentage of the estimated GDP, which represents the total value of goods and services produced in the U.S., provides a measure of the cost of the OASDI program in relation to the size of the national economy that must finance it.

In calendar year 2020, OASDI cost was about \$1.1 trillion, which was about 5.3 percent of GDP. The cost of the program (based on current law) rises to a peak of 6.2 percent of GDP in 2077, then declines to 5.9 percent by 2095. The increase from 2021 to 2039 is projected to occur as baby boomers continue to become eligible for OASDI benefits, lower birth rates result in fewer workers per beneficiary, and beneficiaries continue to live longer.

Chart 3—OASDI Income (Excluding Interest) and Expenditures as a Percent of GDP 2016-2095



Medicare Projections

Medicare Legislation. The projections presented here are based on current law, certain features of which may result in some challenges for the Medicare program. In 2010 the PPACA was signed into law and contains the most significant changes to health care coverage since the *Social Security Act*. The PPACA provided funding for the establishment of a Center for Medicare and Medicaid Innovation to test innovative payment and service delivery models to reduce program expenditures while preserving or enhancing the quality of care furnished to individuals. If the health sector cannot transition to more efficient models of care delivery and if the provider reimbursement rates paid by commercial insurers continue to be based on the same negotiated process used to date, then the availability, particularly with respect to physician services, and quality of health care received by Medicare beneficiaries would, under current law, fall over time compared to that received by those with private health insurance.

Incorporated in these projections is the sequestration of non-salary Medicare expenditures as required by the following laws:

- *Budget Control Act of 2011* (P.L. 112-25, enacted on August 2, 2011), as amended by the *American Taxpayer Relief Act of 2012* (P.L. 112-240, enacted on January 2, 2013);
- *Continuing Appropriations Resolution, 2014* (P.L. 113-67, enacted on December 26, 2013);
- Sections 1 and 3 of P.L. 113-82, enacted on February 15, 2014;
- *Protecting Access to Medicare Act of 2014* (P.L. 113-93, enacted on April 1, 2014);
- BBA of 2015 (P.L. 114-74, enacted on November 2, 2015);
- BBA of 2018 (P.L. 115-123, enacted on February 9, 2018);
- BBA of 2019 (P.L. 116-37, enacted on August 2, 2019);
- The CARES Act (P.L. 116-136, enacted on March 27, 2020);
- The CAA, 2021 (P.L. 116-260, enacted on December 27, 2020); and
- *An Act to Prevent Across-the-Board Direct Spending Cuts, and for Other Purposes* (P.L. 117-7, enacted on April 14, 2021).

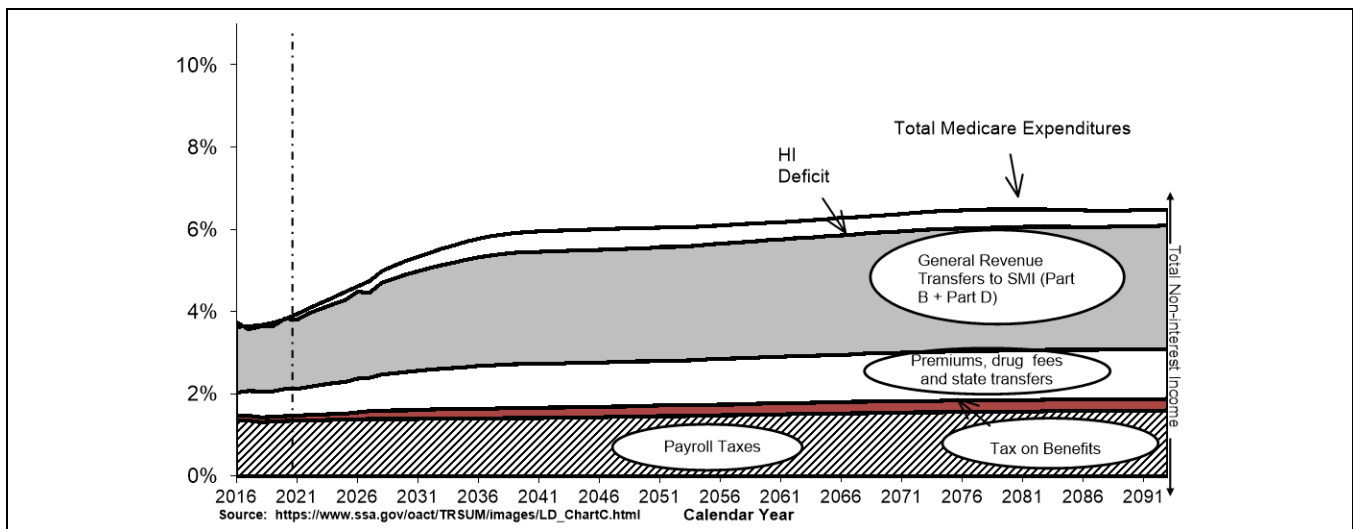
The sequestration reduces benefit payments by 2.0 percent from April 1, 2013 through April 30, 2020, by 2.0 percent from January 1, 2022 through September 15, 2030 and by 4.0 percent from September 16, 2030 through the first half of March 2031. Due to sequestration, non-salary administrative expenses are reduced by an estimated 5.0 to 7.0 percent from March 1, 2013 through September 30, 2030.

The financial projections for the Medicare program reflect substantial, but very uncertain, cost savings deriving from current law provisions that lower increases in Medicare payment rates to most categories of health care providers, but such adjustments would probably not be viable indefinitely without fundamental change in the current delivery system. In view of the factors described above, it is important to note that Medicare’s actual future costs are highly uncertain for reasons apart from the inherent challenges in projecting health care cost growth over time. For additional information refer to the “Medicare – Illustrative Alternative Scenario” section of Note 25—Social Insurance and HHS’s financial statements.

Changes in Projection Methods. The long-range cost growth rates must be modified to reflect demographic impacts. In the 2020 report, these impacts reflected the changing distribution of Medicare enrollment by age and sex, and the beneficiary's proximity to death, which is referred to as a TTD adjustment. The TTD adjustment reflects the fact that the closer an individual is to death, the higher his or her health care spending is.

Total Medicare. Chart 4 shows expenditures and current-law non-interest revenue sources for HI and SMI combined as a percent of GDP. Under the PPACA, beginning in 2013 the HI Trust Fund receives an additional 0.9 percent tax on earnings in excess of \$250,000 for joint tax return filers and \$200,000 for individual tax return filers. As a result of this provision, it is projected that payroll taxes will grow slightly faster than GDP. After 2021, HI revenue from income taxes on Social Security benefits will gradually increase as a share of GDP as the share benefits subject to such taxes increase. Beginning in 2009, as HI payroll tax receipts declined due to the recession and general revenue increased, the transfers became the largest single source of income to the Medicare program as a whole. General revenue transfers to the Part B account increased significantly in 2016, as required by the BBA of 2015 to compensate for premium revenue that was not received in 2016 due to the hold harmless provision, which limited the Part B premium increase for a majority of beneficiaries. After decreasing from 2016 to 2017, and from 2020 through 2022 general revenues are projected to gradually increase through 2039 to about 50.0 percent of Medicare financing, stabilizing thereafter. SMI premiums will also grow in proportion to general revenue transfers, placing a growing burden on beneficiaries. Medicare Part B and D general revenues equal 2.0 percent of GDP in 2020 and will increase to an estimated 3.1 percent in 2095 under current law.

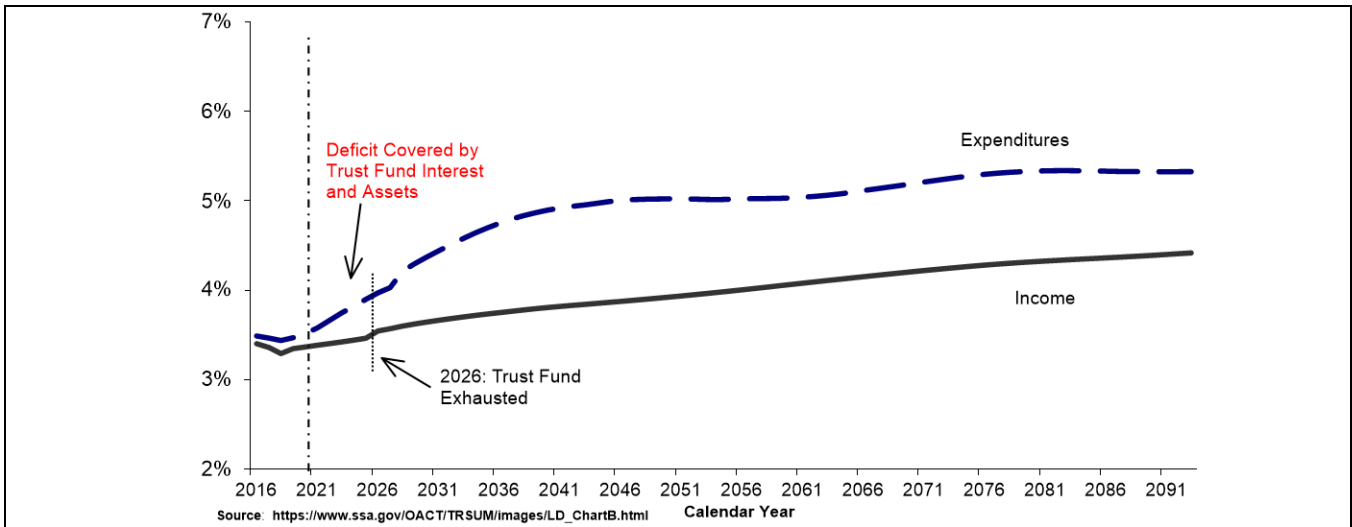
Chart 4—Total Medicare (HI and SMI) Expenditures and Non-interest Income as a Percent of GDP 2016-2095



Medicare, Part A Income and Expenditures as a Percent of Taxable Payroll. Chart 5 illustrates income (excluding interest) and expenditures as a percentage of taxable payroll. The standard HI payroll tax rate is not scheduled to change in the future under current law, most payroll tax income as a percentage of taxable payroll is estimated to remain constant at 2.9 percent. Income from taxation of Social Security benefits will also increase faster than taxable payroll because the income thresholds determining taxable benefits are not indexed for price inflation. Since these income thresholds are not indexed, over time an increasing proportion of workers and their earnings will become subject to the additional HI tax rate.

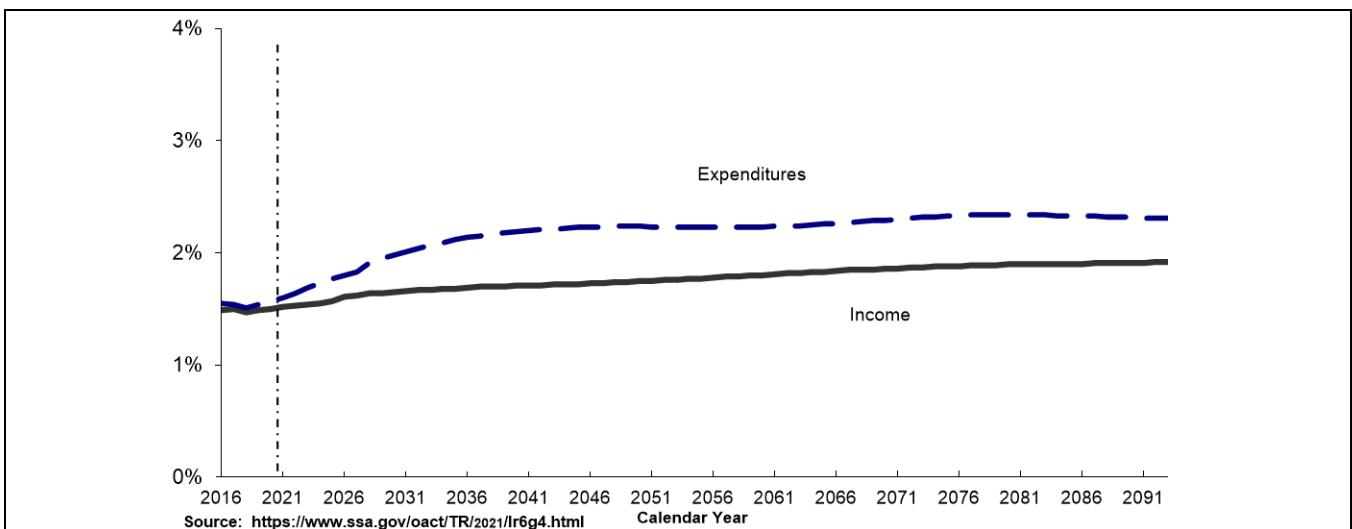
In 2021 and beyond, as indicated in Chart 5, the cost rate is projected to rise, primarily due to the continued retirements of those in the Baby Boom generation and partly due to an acceleration of health services cost growth. This cost rate increase is moderated by the accumulating effect of the productivity adjustments to provider price updates, which are estimated to reduce annual HI per capita cost growth by an average of 0.5 percent through 2030 and 1.0 percent thereafter. The percentage of expenditures covered by tax revenues is projected to decrease from 91.0 percent in 2026 to 78.0 percent in 2045 and then to increase to about 91.0 percent by the end of the projection period.

Chart 5—Medicare Part A Income (Excluding Interest) and Expenditures as a Percent of Taxable Payroll 2016-2095



Medicare, Part A Income and Expenditures as a Percent of GDP. Chart 6 shows estimated annual non-interest income and expenditures, expressed as a percent of GDP, the total value of goods and services produced in the U.S. This measure provides an idea of the relative financial resources that will be necessary to pay for Medicare services. In 2020, the expenditures were \$402.2 billion, which was 1.9 percent of GDP. This percentage is projected to increase steadily until about 2042 and then remain fairly level throughout the rest of the 75-year period, as the accumulated effects of the price update reductions are realized.

Chart 6—Medicare Part A Income (Excluding Interest) and Expenditures as a Percent of GDP 2016-2095

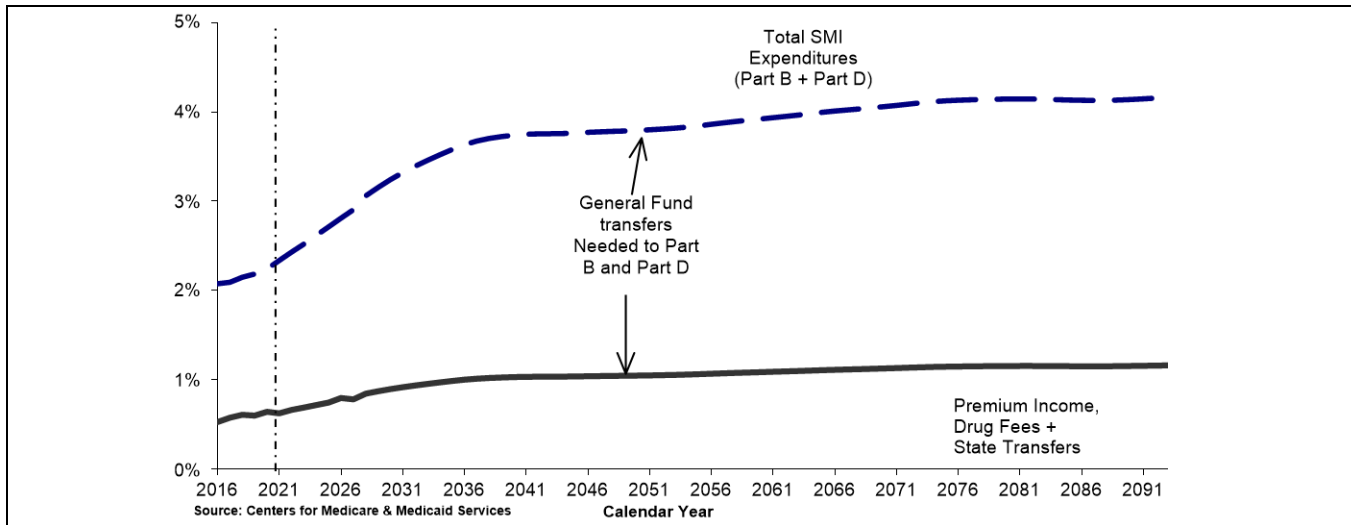


Medicare Part B and Part D Premium as well as State Transfer Income and Expenditures as a Percent of GDP. Chart 7 shows expenditures for the Part B and D Program expressed as a percent of GDP. It is important to examine the projected rise in expenditures and the implications for beneficiary premiums and General Fund transfers.

In 2020, SMI expenditures were \$523.6 billion, or about 2.5 percent of GDP. Under current law, they would grow to about 4.0 percent of GDP within 25 years and to 4.4 percent by the end of the projection period. To match the faster growth

rates for SMI expenditures, beneficiary premiums, along with general revenue contributions, would increase more rapidly than GDP over time but at a slower rate compared to the last 10 years. Average per beneficiary costs for Part B and Part D benefits are projected to increase after 2020 by about 4.3 percent annually. The associated beneficiary premiums—and General Fund transfers would increase by approximately the same rate. The special state payments to the Part D account are set by law at a declining portion of the states' forgone Medicaid expenditures attributable to the Medicare drug benefit.

**Chart 7—Medicare Part B and Part D Premium and State Transfer
Income and Expenditures as a Percent of GDP
2016-2095**



Social Security and Medicare Sensitivity Analysis

Projections of the future financial status of the Social Insurance programs depend on many demographic and economic assumptions. The estimates presented here are based on the assumption that the trust funds will continue under current law except that the full amount of Social Security and Medicare HI scheduled benefits are paid after trust fund depletion contrary to current law. Income will depend on how these factors affect the size and composition of the working population and the level and distribution of wages and earnings. Similarly, the cost will depend on how these factors affect the size and composition of the beneficiary population and the general level of benefits.

Because actual experience is likely to differ from the estimated or assumed values of these factors, this section is included to illustrate the sensitivity of the long-range projections to changes in assumptions by analyzing key assumptions: average annual reduction in death rates for Social Security, average annual growth in health costs for Medicare, total fertility rate, real-wage differential, CPI change, net immigration, and real interest rate.

For this analysis, the intermediate assumptions are used as the reference point, and each selected assumption is varied individually. The variation used for each individual assumption reflects the levels used for that assumption in the low-cost and high-cost projections. For example, when analyzing sensitivity with respect to variation in real wages, income, and expenditure projections using the intermediate assumptions are compared to the outcome when projections are done by changing only the real wage assumption to either low-cost or high-cost alternatives.

While the COVID-19 pandemic has significantly affected the Medicare short-term financing and spending, it is not expected to have a large effect on the financial status of the trust funds after 2024. The pandemic is an example of the inherent uncertainty in projecting healthcare financing and spending over any duration.

The following tables show the PV of the estimated excess of Social Security and Medicare cost over income for the 75-year period, using various assumptions, which are shown in parentheses. The low-cost alternative is characterized by assumptions that improve the financial status of the program (relative to the intermediate assumption) such as slower improvement in mortality (beneficiaries die younger). In contrast, assumptions under the high-cost alternative worsen the financial outlook. All PV are calculated as of January 1, 2021 and are based on estimates of income and cost during the 75-year projection period 2021-2095. Refer to SSA's and HHS's unaudited RSI—Social Insurance section for additional information on the Social Insurance programs sensitivity analysis.

Present Values of Estimated OASDI Expenditures in Excess of Income Under Various Assumptions, 2021-2095

(Dollar values in billions; values of assumptions shown in parentheses)

Assumption	Financing Shortfall Range		
	Low	Intermediate	High
Average annual reduction in death rates	18,723 (0.3)	22,742 (0.7)	27,530 (1.3)
Total fertility rate ¹	20,589 (2.2)	22,742 (2.0)	25,789 (1.7)
Real-wage differential ¹	18,579 (1.8)	22,742 (1.2)	25,390 (0.5)
CPI change	22,174 (3.0)	22,742 (2.4)	23,327 (1.8)
Net immigration ¹	21,271 (1,688,000)	22,742 (1,248,000)	24,128 (830,000)
Real interest rate	19,364 (2.8)	22,742 (2.3)	26,986 (1.8)

¹ The amounts shown represent averages over the last 65 years of the 75-year projection period.

Source: 2021 OASDI Trustees Report and SSA.

The increase and decrease discussed below for each projection are relative to the changes shown in the table above over the 75-year projection period.

- The average annual reduction in death rates: If people die younger Social Security income relative to cost would decrease by \$4,019.0 billion; if people live longer shortfall would increase by \$4,788.0 billion.
- Total fertility rate: If there are more workers compared to beneficiaries Social Security income relative to cost would decrease by \$2,153.0 billion; if there are fewer workers compared to beneficiaries the shortfall would increase by \$3,047.0 billion.
- Real-wage differential: Higher real wage growth results in faster income growth relative to expenditure growth; if real-wage growth is higher Social Security income relative to cost would decrease by \$4,163.0 billion; if real-wage growth is lower the shortfall would increase by \$2,648.0 billion.
- CPI change: If the ultimate annual increase in the CPI percentage is higher Social Security income relative to cost would decrease by \$568.0 billion; if the ultimate annual increase in the CPI percentage is lower shortfall would increase by \$585.0 billion.
- Net immigration: If there is a larger increase in immigration levels then Social Security income relative to cost would decrease by \$1,471.0 billion; if there is a smaller increase in immigration levels the shortfall would increase by \$1,386.0 billion.
- Real interest rate: If the ultimate real interest rate is higher than Social Security income relative to cost when measured in PV terms would decrease by \$3,378.0 billion; if the ultimate annual real interest rate is lower, then the shortfall would increase by \$4,244.0 billion.

Present Values of Estimated Medicare Part A Expenditures in Excess of Income Under Various Assumptions, 2021-2095

(Dollar values in billions; values of assumptions shown in parentheses)

Assumption	Financing Shortfall Range		
	Low	Intermediate	High
Average annual growth in health costs.....	(3,990) (2.7)	5,057 (3.7)	19,568 (4.7)
Total fertility rate.....	4,326 (2.2)	5,057 (2.0)	6,093 (1.7)
Real wage differential	2,025 (1.8)	5,057 (1.2)	6,718 (0.5)
CPI change	3,862 (3.0)	5,057 (2.4)	6,676 (1.8)
Net immigration.....	4,783 (1,736,000)	5,057 (1,280,000)	5,861 (844,000)
Real interest rate	4,446 (2.8)	5,057 (2.3)	5,563 (1.8)

Source: CMS

The increase and decrease discussed below for each projection are relative to the changes shown in the table above over the 75-year projection period.

- Average annual growth in health care costs: The financial status of the HI Trust Fund is extremely sensitive to the growth rates for health care service costs. Slower growth rates will produce a lower aggregate cost of providing covered health care services. If a slower growth rate is attained Medicare Part A income relative to cost would decrease by \$9,047.0 billion; if the growth rate is higher the shortfall would increase by \$14,511.0 billion.
- Total fertility rate: If there are more workers compared to beneficiaries Medicare Part A income relative to cost would decrease by \$731.0 billion; if there are fewer workers compared to beneficiaries, the shortfall would increase by \$1,036.0 billion.
- Real-wage differential: Faster real-wage growth results in smaller HI cash flow deficits. If real-wage growth is higher Medicare Part A income relative to cost would decrease by \$3,032.0 billion; if real wage growth is lower, the shortfall would increase by \$1,661.0 billion.
- CPI change: If the ultimate annual increase in the CPI percentage is higher Medicare Part A income relative to cost would decrease by \$1,195.0 billion; if the ultimate annual increase in the CPI percentage is lower the shortfall would increase by \$1,619.0 billion.
- Net immigration: If there is a larger increase in immigration levels then Medicare Part A relative to cost would decrease by \$274.0 billion; if there is a smaller increase in immigration levels the shortfall would increase by \$804.0 billion.
- Real interest rate: If the ultimate real interest rate is higher than Medicare Part A income relative to cost, when measured in PV terms would decrease by \$611.0 billion; if the ultimate real interest rate is lower, then the shortfall would increase by \$506.0 billion.

Present Values of Estimated Medicare Parts B and D Future Expenditures Less Premium Income and State Transfers Under Three Health Care Cost Growth Assumptions, 2021-2095

(In billions of dollars)

	Government-wide Resources Needed		
	Low	Intermediate	High
Medicare Program¹	(2.7)	(3.7)	(4.7)
Part B	25,282	35,503	51,693
Part D	5,402	7,657	11,273

¹ Annual growth rate is the aggregate cost of providing covered health care services to beneficiaries. The low and high scenarios assume that costs increase 1.0 percent slower or faster, respectively, than the intermediate assumption.

Source: CMS

The table above shows the effects of various assumptions about the growth in health care costs on the PV of estimated Part B and D expenditures in excess of income in the terms of government-wide resources needed due to the financing mechanism (General Fund transfers) for Medicare Parts B and D. As with Part A, net Part B and D expenditures are very sensitive in the health care cost growth assumption. If a slower growth rate is attained government-wide resources needed for Part B would decrease by \$10,221.0 billion and Part D by \$2,255.0 billion; if the growth rate is higher, government-wide resources needed would increase to \$16,190.0 billion for Part B and to \$3,616.0 billion for Part D.

Sustainability of Social Security and Medicare

75-Year Horizon

According to the 2021 Medicare Trustees’ Report, the HI Trust Fund is projected to remain solvent until 2026 and, according to the 2021 Social Security Trustees’ Report, the OASI and DI Trust Fund is projected to have sufficient reserves to pay full benefits on time until 2033 and 2057, respectively. In each case, some general revenues must be used to satisfy the authorization of full benefit payments until the year of trust fund depletion. This occurs when the trust fund interest income and balances accumulated during prior years are needed to pay benefits, which leads to a transfer from general revenues to the trust funds. Moreover, under current law, General Fund transfers to the SMI Trust Fund will occur into the indefinite future and will continue to grow with the growth in health care expenditures.

The potential magnitude of future financial obligations under these three social insurance programs is, therefore, important from a budget perspective as well as for understanding generally the growing resource demands of the programs on the economy. From the 75-year budget perspective, the PV of the additional resources that would be necessary to meet projected expenditures, for the three programs combined, is \$71.0 trillion. To put this figure in perspective, it would represent 4.6 percent of the PV of projected GDP over the same period (\$1,545.0 trillion). These resource needs would be in addition to the payroll taxes, benefit taxes, and premium payments. Asset redemptions and Medicare Part B and D general revenue transfers represent formal budget commitments, but no provision exists for covering the Medicare Part A and Social Security Trust Fund deficits once assets are depleted.

The table below shows the magnitudes of the primary expenditures and sources of financing for the three trust funds computed on an open-group basis for the next 75 years and expressed in PV. The data are consistent with the SOSI included in the principal financial statements.

From the government-wide perspective, the PV of the total resources needed for the Social Security and Medicare Programs over and above current-law funding sources (payroll taxes, benefit taxes, and premium payments from the public) is \$70,959.0 billion. From the trust fund perspective, which counts the trust funds (\$3,249.0 billion) and the general revenue transfers to the SMI Program (\$43,160.0 billion) as dedicated funding sources, additional resources needed to fund the programs are \$24,550.0 billion.

**Present Values of Costs Less Revenues of 75-Year Open Group Obligations
HI, SMI, and OASDI as of January 1, 2021**

(In billions of dollars)	HI	SMI		OASDI	Total
		Part B	Part D		
Revenues from the public:					
Taxes	26,319	-	-	78,580	104,899
Premiums and state transfers.....	391	14,509	3,206	-	18,106
Total	26,710	14,509	3,206	78,580	123,005
Total costs to the public	31,767	50,012	10,863	101,322	193,964
Net results - budget perspective ¹	5,057	35,503	7,657	22,742	70,959
Revenues from other government accounts	-	35,503	7,657	-	43,160
Trust fund balances as of 1/1/2021	198	133	10	2,908	3,249
Net results - trust fund perspective ¹	4,859	(133)	(10)	19,834	24,550

¹Net results are computed as costs less revenues and trust fund balances. Negative values are indicative of surpluses.

Source: 2021 OASDI and Medicare Trustees' Reports

Infinite Horizon

The 75-year horizon is consistent with the primary focus of the Social Security and Medicare Trustees' Reports. Experts have noted that limiting the projections to 75 years understates the magnitude of the long-range unfunded obligations because summary measures (such as the actuarial balance and open-group unfunded obligations) reflect the full amount of taxes paid by the next two or three generations of workers, but not the full amount of their benefits. One approach to addressing the limitation of 75-year summary measures is to extend the projections horizon indefinitely, so that the overall results reflect the projected costs and revenues after the first 75 years. The open-group infinite horizon net obligation is the PV of all expected future program outlays less the PV of all expected future program tax and premium revenues. Such a measure is provided in the following table for the three trust funds represented above.

From the budget or government-wide perspective, the values in line 1 plus the values in line 4 are summed in the last line of the table and represent the value of resources needed to finance each of the programs into the infinite future. The total resources needed for all the programs sums to \$166.1 trillion in PV terms. This need can be satisfied only through increased borrowing, higher taxes, reduced program spending, or some combination.

The second line shows the value of the trust fund at the beginning of 2021. For the HI and OASDI Programs this represents the extent the programs are funded from the trust fund perspective. From that perspective, when the trust fund is subtracted, an additional \$59.8 trillion is needed to sustain the Social Security program into the infinite future, while the Medicare Part A program reflects a projected surplus of \$10.5 trillion over the infinite horizon. As described above, from the trust fund perspective, the SMI Program is fully funded; from a government-wide basis, the substantial gap that exists between premiums, state transfer revenue, and program expenditures in the Part B and D Program (\$87.4 trillion and \$26.2 trillion, respectively) represents future general revenue obligations of the federal budget.

In comparison to the analogous 75-year number in the table above, extending the calculations beyond 2095, captures the full lifetime benefits, plus taxes and premiums of all current and future participants. The shorter horizon understates the total financial needs by capturing relatively more of the revenues from current and future workers and not capturing all the benefits that are scheduled to be paid to them.

**Present Values of Costs Less Tax, Premium and State Transfer Revenue
through the Infinite Horizon, HI, SMI, OASDI as of January 1, 2021**

(In trillions of dollars)	HI	SMI		OASDI	Total
		Part B	Part D		
Present value of future costs less future taxes, premiums, and state transfers for current participants ...	13.5	29.0	5.6	46.2	94.3
Less current trust fund balance	0.2	0.1	-	2.9	3.2
Equals net obligations for past and current participants.	13.3	28.9	5.6	43.3	91.1
Plus net obligations for future participants	(23.8)	58.5	20.6	16.5	71.8
Equals net obligations through the infinite future for all participants	(10.5)	87.4	26.2	59.8	162.9
Present values of future costs less the present values of future income over the infinite horizon	(10.3)	87.5	26.2	62.7	166.1

Source: 2021 OASDI and Medicare Trustees' Reports

Railroad Retirement, Black Lung, and Unemployment Insurance

Railroad Retirement

The RRB was created in the 1930s to establish a retirement benefit program for the nation's railroad workers. The RRB and the SSA share jurisdiction over the payment of retirement and survivor benefits. Railroad retirement pays full retirement annuities at age 60 to railroad workers with 30 years of service and disability annuities based on total or occupational disability. It also pays annuities to certain beneficiaries of deceased railroad workers.

Payroll taxes paid by railroad employers and their employees provide a primary source of income for the Railroad Retirement and Survivors' Benefit Program. Other sources of program income include: the RRB-SSA-CMS Financial Interchanges with the Social Security and Medicare Trust Funds, federal income taxes on railroad retirement benefits, appropriations, and earnings on investments.

Revenues in excess of benefit payments are invested to provide additional trust fund income. Legislation enacted in 2001 allowed for Railroad Retirement Account funds transferred to the NRRIT to be invested in non-governmental assets, as well as in governmental securities.

Since its inception, NRRIT has received \$21.3 billion from RRB and returned \$29.8 billion. During FY 2021, the NRRIT made net transfers of \$2.8 billion to the RRB to pay retirement benefits. Administrative expenses of the trust are paid out of trust assets. The balance as of September 30, 2021, and 2020, of non-federal securities and investments of the NRRIT are disclosed in Note 7—Investments.

Black Lung

The Federal Coal Mine Health and Safety Act of 1969 created the BLDBP to provide compensation, medical, and survivor benefits for eligible coal miners who are totally disabled due to pneumoconiosis (Black Lung Disease) arising out of their coal mine employment and the BLDTF provides benefit payments when no responsible mine operator can be assigned the liability.

Black lung disability benefit payments are funded by excise taxes from coal mine operators based on the domestic sale of coal, as are the program's administrative costs. These taxes are collected by the IRS and transferred to the BLDTF.

P.L. 110-343, *Division B-Energy Improvement and Extension Act of 2008*, enacted on October 3, 2008, among other things, restructured the BLDTF debt by refinancing the outstanding high interest rate repayable advances with low interest rate discounted debt instruments similar in form to zero-coupon bonds, plus a one-time appropriation. This act also allowed that any subsequent debt issued by the BLDTF may be used to make benefit payments, other authorized expenditures, or to repay debt and interest from the initial refinancing.

Unemployment Insurance

The UI Program was created in 1935 to provide income assistance to unemployed workers who lose their jobs generally through no fault of their own and are unemployed due to a lack of suitable work. The program protects workers during temporary periods of unemployment through the provision of unemployment compensation benefits. The program is administered through a unique system of federal and state partnerships established in federal law but executed through conforming state laws by state officials. The federal government provides broad policy guidance and program direction through the oversight of DOL, while program details are established through individual state UI statutes, administered through state UI entities.

The UI Program is financed through the collection of federal and state unemployment taxes levied on subject employers and deposited in the UTF and federal appropriations. The fund was established to account for the receipt, investment, and disbursement of unemployment taxes. Federal unemployment taxes are used to pay for the administrative costs of the UI Program, including grants to each state to cover the costs of state UI operations and the federal share of extended UI benefits. Federal unemployment taxes are also used to fund an account within the UTF to make advances to state UI accounts when a state's UI account balance has been exhausted and the state is unable to make benefit payments.

Cash Flow Projections

Railroad Retirement Income and Expenditures. Railroad retirement cash flow projections are based on the intermediate set of assumptions used in the RRB's actuarial valuation of the program. Estimated railroad retirement expenditures are expected to exceed estimated income (excluding interest) throughout most of the period, except in 2065.

Sensitivity Analysis. The projections of the future financial status of the RRP depend on many economic and demographic assumptions. For additional information on the sensitivity of the long-range projections of the RRP and how the projections are impacted by changes in certain key assumptions, refer to RRB's financial statements.

Black Lung Projected Cash Inflows and Outflows, in Constant Dollars, for the Open Group. The significant assumptions used in the projections show that cash outflows for benefit payments and administrative expenses will exceed cash inflows from excise taxes for all years in the projection period.

Sensitivity Analysis. For the projected cash inflows and outflows with sensitivity analysis, in constant dollars for the open group, the significant assumption for medical cost inflation was increased while other significant assumptions were left unchanged. For additional information on the sensitivity of the projections of the BLDBP and how the projections are impacted by changes in assumptions, refer to DOL's financial statements.

Unemployment Insurance Projected Cash Inflows and Outflows, in Constant Dollars, Under Expected Economic Conditions. The significant assumptions used in the cash flow projections of the UTF show total cash inflow exceeds total cash outflow in all years in the projection period.

Sensitivity Analysis. The effect on the accumulated UTF assets of projected total cash inflows and cash outflows of the UTF, in constant dollars, over the ten-year period ending September 30, 2031, are demonstrated in two sensitivity analyses. Each sensitivity analysis uses an open group, which includes current and future participants in the UI Program. Sensitivity Analysis I assumes higher rates of unemployment and Sensitivity Analysis II assumes even higher rates of unemployment. In Sensitivity Analysis I, there are net cash outflows in FY 2022 through 2024, but there is a net cash inflow in FY 2025 and net cash inflows continue through 2031. In Sensitivity Analysis II, net cash outflows are projected in FY 2022 through 2025, but inflows exceed outflows in FY 2026 through 2031; net cash inflows are reestablished in FY 2026 and peak in FY 2030 with a decrease in unemployment rate in FY 2030 and then lower in 2031. For additional information on the sensitivity of the projections of the UI Program, refer to DOL's financial statements.

Sustainability

Sustainability of Railroad Retirement from a trust fund perspective, when the trust fund balance (\$26.2 billion) and the financial interchange and transfers (\$87.5 billion) are included, the combined balance of the NRRIT, the Railroad Retirement Account, and the Social Security Equivalent Benefit Account show a slight surplus (\$1.4 billion). For additional information related to the sustainability of the RRP, refer to RRB's financial statements.

On September 30, 2021, total liabilities of the BLDTF exceeded assets by nearly \$6.1 billion. This net position deficit represents the accumulated shortfall of excise taxes necessary to meet benefit payments, administrative costs, and interest expense incurred prior to and subsequent to the debt refinancing pursuant to P.L. 110-343. Prior to the enactment of P.L. 110-343, this shortfall was funded by repayable advances to the BLDTF, which were repayable with interest. Pursuant to P.L. 110-343, any shortfall will be financed with debt instruments similar in form to zero-coupon bonds, with a maturity date of one year and bear interest at Treasury's 1-year rate.

The ability of the UI Program to meet a participant's future benefit payment needs depends on the availability of accumulated taxes and earnings within the UTF. The effect of projected benefit payments on the accumulated net assets of the UTF is measured, under an open group scenario, which includes current and future participants in the UI Program. As of September 30, 2021, total assets within the UTF exceeded total liabilities by nearly \$14.1 billion. At the present time there is a surplus; any surplus of tax revenues and earnings on these revenues over benefit payment expenses is available to finance benefit payments in future periods when tax revenues may be insufficient.

For additional information related to the sustainability of the RRP, BLDBP, and UI refer to RRB's and DOL's financial statements.

Unemployment Trust Fund Solvency

Each state's accumulated UTF net assets or reserve balance should provide a defined level of benefit payments over a defined period. To be minimally solvent, a state's reserve balance should provide for one year's projected benefit payment needs based on the highest levels of benefit payments experienced by the state over the last 20 years. A ratio of 1.00 or greater indicates that the state UTF account balance is minimally solvent. States below this level are vulnerable to exhausting their funds in a recession. States exhausting their reserve balance must borrow funds from either FUA or the private markets to make benefit payments. During FY 2021, the balances in the FUA and EUCA were depleted and the FUA and EUCA borrowed from the General Fund as advances from Treasury. FUA and EUCA outstanding advances were \$45.0 billion and \$10.0 billion, respectively, as of September 30, 2021. Several Unemployment Programs were created due to the COVID-19 pandemic and funded by the CARES Act. Please refer to Note 30—COVID-19 Activity for additional information.

The results of DOL's state by state analysis indicate 38 state UTF accounts and the accounts of the D.C., Puerto Rico, and the Virgin Islands were below the minimal solvency ratio of 1.00 at September 30, 2021.

Deferred Maintenance and Repairs

DM&R result from maintenance not being performed on a timely basis and is the estimated cost to bring government-owned PP&E to an acceptable condition. DM&R exclude the cost of expanding the capacity of assets or upgrading them to serve needs different from those originally intended. The consequences of not performing regular maintenance and repairs could include increased safety hazards, poor service to the public, higher costs in the future, and inefficient operations. Estimated DM&R costs are not accrued in the Statements of Net Cost or recognized as a liability on the Balance Sheets.

The amounts disclosed for DM&R are allowed to be measured using one of the following three methods:

- Condition assessment surveys which are periodic inspections of government-owned property to determine the current condition and estimated cost to bring the property to an acceptable condition.
- Life-cycle cost forecast that is an acquisition or procurement technique that considers operation, maintenance, and other costs in addition to the acquisition cost of assets.
- Any other method of choice that is similar to the condition assessment survey or life-cycle costing methods.

The table below of DM&R is presented as a single estimate in accordance with SFFAS No. 42, *Deferred Maintenance and Repairs: Amending Statements of Federal Financial Accounting Standards 6, 14, 29, and 32*. These amounts were all measured using the condition assessment survey method. Please refer to the individual financial statements of DOD, DOI, VA, DOE, USDA, NASA, HHS, GSA, DHS, State, DOC, and DOT for additional information on DM&R.

Deferred Maintenance and Repairs as of September 30, 2021, and 2020		
(In billions of dollars)	2021	2020
Asset category:		
General property, plant, and equipment	174.8	182.1
Heritage assets	24.8	25.6
Stewardship land.....	0.7	0.6
Total deferred maintenance and repairs	<u>200.3</u>	<u>208.3</u>

Other Claims for Refunds

Other claims for refunds are claims filed for which specific administrative actions such as review by the courts are required before payments can be made and unasserted claims for refund by taxpayers or importers that may or may not become payable depending upon the resolution of subsequent events. As stated in SFFAS No. 7, *Accounting for Revenue and Other Financing Sources and Concepts for Reconciling Budgetary and Financial Accounting*, unasserted claims for refund such as unfiled claims for refunds or drawbacks for which no claim has been filed, are not known, therefore estimates are not able to be determined, and are not recognized on the Balance Sheet. Claims filed for refunds where required administrative actions are not yet complete as of the close of the reporting period may not be known however, the refunds, may be reasonably estimable.

Management has estimated amounts that may be paid out as other claims for tax refunds. This estimate represents an amount (principal and interest) that may be paid for claims pending judicial review by the federal courts or, internally, by appeals. The total estimated payout (including principal and interest) for claims pending judicial review by the federal courts is \$1.5 billion and \$1.6 billion for FYs 2021 and 2020, respectively. For those under appeal, the estimated payout is \$1.0 billion and \$1.7 billion for FYs 2021 and 2020, respectively. To the extent judgments against the government for these claims prompt other similarly situated taxpayers to file similar refund claims, these amounts could become significantly greater.

Tax Assessments

The government is authorized and required to make inquiries, determinations, and assessments of all taxes that have not been duly paid. Unpaid assessments result from taxpayers filing returns without sufficient payment, as well as enforcement programs such as examination, under-reporter, substitute for return, and combined annual wage reporting. Under federal accounting standards, unpaid assessments are categorized as taxes receivable if taxpayers agree or a court has determined the assessments are owed. If neither of these conditions are met, the unpaid assessments are categorized as compliance assessments. Assessments with little or no future collection potential are called write-offs. Although compliance assessments and write-offs are not considered receivables under federal accounting standards, they represent legally enforceable claims of the government. There is, however, a significant difference in the collection potential between compliance assessments and receivables.

Compliance assessments and pre-assessment work in process are \$83.9 billion and \$76.1 billion for FYs 2021 and 2020, respectively. The amount of allowance for uncollectible amounts pertaining to compliance assessments cannot be reasonably estimated, and thus the net realizable value of the pre-assessment work-in-process cannot be determined. The amount of assessments that entities have statutory authority to collect at the end of the period but that have been written off and excluded from accounts receivable are \$85.5 billion and \$95.1 billion for FYs 2021 and 2020, respectively.

Federal Oil and Gas Resources

The DOI is responsible for managing the nation's oil and natural gas resources and the mineral revenues on federal lands, both onshore and on the Outer Continental Shelf. This management process can be broken down into six essential analysis components: pre-leasing, post-leasing and pre-production, production and post-production, revenue collection, fund disbursement, and compliance.

Federal Oil and Gas Resources as of September 30, 2021, and 2020

(In billions of dollars)	Offshore		Onshore		Total	
	2021	2020	2021	2020	2021	2020
Oil and lease condensate.....	30.8	32.0	19.9	19.2	50.7	51.2
Natural gas, wet after lease separation.....	2.3	2.2	20.1	17.3	22.4	19.5
Total	<u>33.1</u>	<u>34.2</u>	<u>40.0</u>	<u>36.5</u>	<u>73.1</u>	<u>70.7</u>

The above table presents the estimated PV of future federal royalty receipts on estimated proved reserves¹² as of September 30, 2021 and 2020. The federal government's estimated petroleum royalties have as their basis the DOE's EIA estimates of proved reserves. The EIA provides such estimates directly for federal offshore areas and they are adjusted to extract the federal subset of onshore proved reserves. The federal proved reserves were then further adjusted to correspond with the effective date of the actual production for calendar year 2019, the most recently published EIA proved reserves report and then are projected, separately for oil and natural gas, over time to simulate a schedule of when the reserves would be produced. Future royalties are then calculated from these production streams by applying future price estimates by the

¹² Per the EIA, lease condensate is a mixture consisting primarily of pentanes and heavier hydrocarbons which is recovered as a liquid from natural gas in lease separation facilities. This category excludes natural gas plant liquids, such as butane and propane, which are recovered at downstream natural gas processing plants or facilities. Also per the EIA, natural gas, wet after lease separation, is the volume of natural gas remaining after removal of lease condensate in lease and/or field separation facilities, if any, and after exclusion of nonhydrocarbon gases where they occur in sufficient quantity to render the gas unmarketable. Natural gas liquids may be recovered from volume of natural gas, wet after lease separation, and at natural gas processing plants (https://www.eia.gov/dnav/ng/TblDefs/ng_prod_deep_tbldef2.asp).

OMB, production growth estimates from the EIA's 2021 Annual Energy Outlook, and effective royalty rates, adjusted for transportation allowances and other allowable deductions. The valuation method used for gas captures royalties from three products—dry gas, wet gas, and natural gas liquids—which collectively are reported as natural gas, wet after lease separation. The PV of these royalties are then determined by discounting the revenue stream back to the effective date at a public discount rate assumed to be equal to the OMB's estimates of future 30-year Treasury bill rates. The 30-year rate was chosen because this maturity life most closely approximates the productive lives of the proved reserves estimates.

**Estimated Federal Oil and Gas Petroleum Royalties (Proved Reserves)
As of September 30, 2021, and 2020**

Petroleum Category	Quantity (In millions)		Average Purchase Price (\$)		Average Royalty Rate (%)	
	2021	2020	2021	2020	2021	2020
Oil and lease condensate (Bbl):						
Offshore	5,001.6	5,126.9	59.43	42.75	13.06	12.96
Onshore	3,702.5	3,461.3	57.72	40.26	12.25	12.15
Total	<u>8,704.1</u>	<u>8,588.2</u>				
Natural gas, wet after lease separation (Mcf):						
Offshore	5,476.6	5,934.9	3.71	2.18	11.59	10.86
Onshore	40,171.3	45,488.3	3.50	2.10	10.62	9.88
Total	<u>45,647.9</u>	<u>51,423.2</u>				

Bbl = barrels

Mcf = 1,000 cubic feet

The table above provides the estimated quantity, a weighted average purchase price, and a weighted average royalty rate by category of estimated federal petroleum royalties at the end of FYs 2021 and 2020.¹³ The estimated quantities, average purchase prices and royalty rates vary by region; the above table reflects an overall weighted average purchase price and royalty rate, and is not presented on a regional basis, but is instead calculated based on regional averages. The prices and royalty rates are based upon historical (or estimated) averages, excluding prior-period adjustments, if any, and are affected by such factors as accounting adjustments and transportation allowances, resulting in effective average prices and royalty rates. Prices are valued at the lease rather than at the market center, and differ from those used to compute the asset estimated PV, which are forecasted and discounted based upon OMB economic assumptions. For additional details on federal oil and gas resources, refer to the financial statements of DOI. In addition to the oil and gas resources discussed above, the federal government also owns oil and gas resources that are not currently under lease.

¹³ Gulf of Mexico proved reserves are royalty-bearing volumes. In the Gulf of Mexico, an additional 518.8 million Bbl for FY 2021 and 598.5 million Bbl for FY 2020 of proved oil reserves, and 374.4 million Mcf for FY 2021 and 534.8 million Mcf for FY 2020 of proved gas reserves are not reflected in these totals as they are estimated to be producible royalty-free under various royalty relief provisions. The NPV of the royalty value of the royalty-free proved reserves volumes in the Gulf of Mexico is estimated to be \$3.2 billion for FY 2021 and \$3.9 billion for FY 2020.

Federal Natural Resources Other than Oil and Gas

Federal Natural Resources Other than Oil and Gas as of September 30, 2021, and 2020

(In billions of dollars)	2021	2020
Coal royalties	8.2	7.9
Total	<u>8.2</u>	<u>7.9</u>

The ONRR within DOI is responsible for the management and collection of revenues associated with federal coal leases which are managed by the BLM within DOI. The ONRR achieves optimal value by ensuring that all natural resource revenues are efficiently and accurately collected as well as disbursed to recipients in a timely manner by performing audit and revenue compliance activities.

The Mineral Leasing Act of 1920, as amended, and the *Mineral Leasing Act for Acquired Lands of 1947*, as amended, gives DOI the responsibility for coal leasing on approximately 700 million acres of federal mineral estate which includes 570 million of acres where coal development is allowed. The surface estate of these lands may be under the control of BLM, the U.S. Forest Service (within USDA), private or state landowners, or other federal entities.

Public lands are available for coal leasing after the lands have been evaluated through a multiple-use planning process. DOI receives coal leasing revenues from a bonus paid at the time of the lease, an annual rent payment of \$3.00 per acre, and royalties paid on the value of the coal after it has been mined. The royalty rate for surface-mining methods is 12.5 percent and is 8.0 percent for underground mining, and the BLM can approve reduced royalty rates based on maximum economic recovery. Regulations that govern BLM's coal leasing program are contained in Title 43, Groups 3000 and 3400 of the CFR.

The above table presents the estimated PV of future federal coal royalty receipts on estimated recoverable reserves as of September 30, 2021 and 2020. The federal government's estimated coal royalties have as their basis the DOI's BLM estimates of recoverable reserves. The federal recoverable reserves are then further adjusted to correspond with the effective date of the analysis and then are projected over time to simulate a schedule of when the reserves would be produced. Future royalties are then calculated by applying future price estimates and effective royalty rates, adjusted for transportation allowances and other allowable deductions. The PV of these royalties are then determined by discounting the revenue stream back to the effective date at a public discount rate assumed to be equal to the OMB's estimates of future 30-year Treasury bill rates. The 30-year rate was chosen because this maturity life most closely approximates the productive lives of the recoverable reserves estimates.

In addition to the coal resources discussed above, the federal government has other natural resources under lease contract whereby the lessee is required to pay royalties on the sale of the natural resource. These natural resources include soda ash, potash (including muriates of potash and langbeinite phosphate), lead concentrate, copper concentrate, and zinc concentrate. Soda ash and potash have the largest estimated PV of future royalties. The federal government also owns coal resources and certain other natural resources that are not currently under lease. For additional details on federal natural resources-other than oil and gas, refer to the financial statements of DOI.