



# Budget Model

## The U.S. Fiscal Imbalance: June 2022

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**Summary:** We estimate that the U.S. federal government faces a permanent fiscal imbalance equal to over 10 percent of all future GDP under current law where future federal spending outpaces tax and related receipts. Federal government debt will climb to 236 percent of GDP by 2050 and to over 800 percent of GDP by year 2095 (within 75 years).

### Key Points

- We estimate that, under current law, the U.S. federal government faces a permanent present-value fiscal imbalance of \$244.8 trillion, or 10.2 percent of all future GDP. This imbalance is equal to 52.7 percent of all future government receipts, 35.6 percent of all future expenditures, or some combination of both.
- Even ignoring the negative macroeconomic feedback effects of rising debt on GDP in these “conventional” estimates, government debt climbs to 236 percent of GDP by 2050. Thereafter, debt continues to climb and exceeds over 800 percent of GDP within 75 years, by the year 2095.
- Under the alternative “no-sunset” policy---where sunsets in 2017 Tax Cuts and Jobs Act are not enforced---the fiscal imbalance increases to \$276.4 trillion, or 11.5 percent of all future GDP.
- For the major entitlement programs---including Social Security, Disability and Medicare Part A---about one-half (54 percent) of the fiscal imbalance in perpetuity comes from past and current generations receiving more in benefits than they paid in taxes.

### Introduction

The United States’ federal government receives funds from tax and non-tax sources (receipts) to fund social safety net transfers and purchase public goods and services (expenditures) for the U.S. population. We combine the latest available micro-data survey information on individual taxes and transfer receipts with a highly detailed microsimulation-based projection of U.S. demographic trends, thereby creating the most detailed long-term

model to date. The calculations include extensive modeling of government expenditures and receipts by household characteristics while accounting for how the distribution of those population characteristics is projected to change over time. A detailed discussion of the model and methods can be found in our companion paper [here](#).

A positive permanent fiscal imbalance implies that federal debt payments continue to increase indefinitely relative to the size of the economy, which is not fiscally sustainable and is the focus of this brief. A second forthcoming brief will report receipt and expenditures by household characteristics in detail. Future work will then examine a range of different possible policy options, including the impact on the macroeconomy from options that reduce the fiscal imbalance toward fiscal sustainability.

## The Fiscal Imbalance: The Next 75 Years, under Current Law

Unlike government debt, which is a backward-looking measure, the “fiscal imbalance” (FI) is the most comprehensive measure of fiscal sustainability available. It is defined as:

$$\begin{aligned} \text{Fiscal imbalance} &= \text{government debt today} + \text{present value of future expenditures} \\ &\quad - \text{present value of future receipts} \end{aligned}$$

The present value calculations are made using the government long-term borrowing rate. This type of calculation is akin to how a private company would have to project its balance sheet under GAAP accounting. One key difference is that the federal government can assume its future viability as a going concern, which allows the government to count future receipts against future liabilities in a way that would be illegal for private firms under GAAP accounting.<sup>1</sup> A fiscal imbalance of zero is required for the government to not have to take any current or future fiscal action (e.g., raise taxes or cut spending) to avoid an unsustainable path where debt payments continue to increase relative to the size of the economy.<sup>2</sup>

Table 1: Federal fiscal imbalance and its components under alternative policies, time horizons, and metrics

Components: 1. US Treasury: Federal Debt; 2. OASDHI: Social Security and Medicare Part-A (OASDHI); 3. NonOASDHI: Federal taxes and transfers excluding those for Social Security and Medicare Part-A; 4. Public Purchases: Federal purchases of public goods and services

(Present values in trillions of constant 2021 dollars and as a percent of the present value of GDP)

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		Current law ("Sunset")							
		75-Year Horizon (2021-2095)				Infinite Horizon (2021...)			
		Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance	Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance
Present values in trillions of constant 2021 dollars *	US Treasury**	-27.5			27.5	-27.5			27.5
	OASDHI***	3.0	86.8	126.2	36.3	3.0	159.7	269.4	106.6
	NonOASDHI***	3.1	162.9	128.9	-37.0	3.1	301.8	272.3	-32.5
	Public Purchases		1.8	79.3	77.5		3.4	146.6	143.2
	Total †	-21.4	251.5	334.5	104.3	-21.4	464.9	688.4	244.8
As a percent of the present value of GDP *									
	US Treasury**	-2.1			2.1	-1.1			1.1
	OASDHI***	0.2	6.7	9.7	2.8	0.1	6.6	11.2	4.4
	NonOASDHI***	0.2	12.5	9.9	-2.8	0.1	12.5	11.3	-1.4
	Public Purchases		0.1	6.1	6.0		0.1	6.1	5.9
	Total †	-1.6	19.3	25.7	8.0	-0.9	19.3	28.6	10.2
		Current law with extension of TCJA expiring provisions ("No Sunset")							
		75-Year Horizon (2021-2095)				Infinite Horizon (2021...)			
		Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance	Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance
Present values in trillions of constant 2021 dollars *	US Treasury**	-27.5			27.5	-27.5			27.5
	OASDHI***	3.0	86.9	126.2	36.3	3.0	159.8	269.4	106.6
	NonOASDHI***	3.1	146.1	128.9	-20.2	3.1	270.1	272.3	-0.9
	Public Purchases		1.8	79.3	77.5		3.4	146.6	143.2
	Total †	-21.4	234.8	334.5	121.1	-21.4	433.3	688.4	276.4
As a percent of the present value of GDP *		75-Year Horizon (2021-2095)				Infinite Horizon (2021...)			

		Current law ("Sunset")							
		Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance	Assets(+)/Debt(-)	Receipts	Expenditures	Fiscal Imbalance
	US Treasury**	-2.1			2.1	-1.1			1.1
	OASDHI***	0.2	6.7	9.7	2.8	0.1	6.6	11.2	4.4
	NonOASDHI***	0.2	11.2	9.9	-1.6	0.1	11.2	11.3	0.0
	Public Purchases		0.1	6.1	6.0		0.1	6.1	5.9
	Total †	-1.6	18.1	25.7	9.3	-0.9	18.0	28.6	11.5

\* Present values calculated at a nominal discount rate of 4.4 percent.

\*\* Assets/Debt column shows gross federal debt.

\*\*\* Assets/Debt column shows intragovernmental debt.

† Assets/Debt column shows debt held by the public.

Table 1 reports the U.S. federal fiscal imbalance for different combinations of assumed baseline policy, planning horizons and relative reporting measures. The reader can try different combinations using the various dropdown menus. Let's first consider the following settings:

Policy = Current law ("Sunset")

Horizon = 75-Year horizon (2021-2095)

Measure = Present values in trillions of constant 2021 dollars

Table 1 reports a total Fiscal Imbalance equal to \$104.3 trillion. That is the extra resources that, if available today, would permit maintenance of current receipt and expenditure laws for the next 75 years (2021-95). In this hypothetical experiment, the government would save this money at the long-term borrowing rate, like a very large trust fund, and spend it down over time as needed, reaching full depletion by the 75th year.

Now, consider a measure of FI relative to future GDP. GDP projections are calculated from PWBM's microsimulation by combining projected labor hours and capital stocks within a standard production framework:<sup>3</sup>

Measure = As a percent of the present value of GDP

The fiscal imbalance for the next 75-years is equal to 8.0 percent of all future GDP. In this comparison, a trust fund is not strictly needed. The federal policy is now sustainable if the government were to, for example, increase revenue, decrease spending, or some combination of both, by an amount equal to 8.0 percent of GDP in each future year. That might include a 41.5 (8.0 / 19.3) percent increase in future receipts over the next 75 years, a 31.1 (8.0/25.7) percent reduction in expenditures, or some combination of both.

Table 1 also indicates that this \$104.3 trillion imbalance (8.0 percent of future GDP) is decomposed into four main components:

1. Gross federal debt as of the beginning of 2021: \$27.5 trillion (2.1 percent of future GDP).

2. Entitlement programs with dedicated funding sources, which include Social Security and Medicare Part-A (OASDHI): The resource shortfall in these two programs is estimated to be \$36.3 trillion (2.8 percent of future GDP).
3. All other taxes and transfer programs (non-OASDHI): A surplus estimate of \$37.0 trillion (2.8 percent of future GDP).
4. Purchases of public goods and services net of associated receipts: Estimated at \$77.5 trillion (6.0 percent of future GDP).

## The Fiscal Imbalance: In Perpetuity, under Current Law

Now, change the Horizon to permanent in Table 1:

Horizon = Infinite Horizon

The fiscal imbalance increases to \$244.8 trillion (with Measure = "Present values in trillions of constant 2021 dollars") or 10.2 percent of all future GDP (with Measure = As a percent of the present value of GDP). Making the federal government's fiscal policy permanently sustainable could now be achieved by increasing all future receipts by 52.7 (10.2 / 19.3) percent, a 35.6 (10.2 / 28.6) percent reduction in expenditures, or some combination of both.

Table 1 also indicates that this \$244.8 trillion imbalance (10.2 percent of all future GDP) is decomposed into four main components:<sup>4</sup>

1. Gross federal debt outstanding: \$27.5 trillion (1.1 percent of future GDP).
2. OASDHI: A shortfall of \$106.6 trillion (4.4 percent of future GDP).
3. Non-OASDHI: A surplus of \$32.5 trillion (1.4 percent of future GDP).
4. Public purchases net of receipts: \$143.2 trillion (5.9 percent of future GDP).

## The Fiscal Imbalance: Without TCJA Sunsets

Finally, change the policy baseline to ignore the sunsets of Tax Cuts and Jobs Act (TCJA) expiring provisions:

Policy = Current law with extension of TCJA expiring extensions

Under current law, several of the personal income tax reductions in the TCJA are set to expire starting in 2025. Assuming that the sunsets are not enforced, therefore, would increase the fiscal imbalance by reducing future receipts. In this alternative scenario, the projections assume that TCJA provisions that are scheduled to expire are, instead, extended indefinitely.

Now the fiscal imbalance increases to \$121.1 trillion over the next 75 years and to \$276.4 trillion on a permanent basis. The permanent amount is equal to 11.5 percent of all future GDP, or, 63.8 (11.5/18.0) percent of all future receipts, 40.2 (11.5 / 28.6) percent of all future expenditures, or some combination thereof.

The reader can consider other combinations as well in Table 1.

## The Generational Imbalance

Social Security, Disability and Medicare Part A (“OASDHI programs”) are exclusively funded out of dedicated resources. For Social Security, these include the resources dedicated through the program trust funds (past surpluses of payroll taxes over benefit payments), taxes levied on covered payrolls, and a portion of income taxes levied on the Social Security benefits received high-income individuals. For Medicare Part A, the funding sources include resources dedicated through the Medicare Part-A trust fund, payroll taxes on all wage earnings, and a portion of income taxes levied on the Social Security benefits of high-income individuals.

Table 2: Fiscal and Generational Imbalances for OASDHI, Social Security (OASDI), Medicare Part-A (HI), and both programs together (OASDHI)

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		Present values in trillions of constant 2021 dollars							
		75-Year Horizon (2021-2095)				Infinite Horizon (2021...)			
		Trust Fund	Receipts	Expenditures	Fiscal imbalance	Trust Fund	Receipts	Expenditures	Fiscal imbalance
Social Security (OASDI)	FI	2.9	63.2	87.9	21.8	2.9	116.7	183.4	63.9
	GI	2.9	23.1	56.0	30.0	2.9	46.6	85.3	35.8
	FI-GI	0.0	40.1	31.9	-8.2	0.0	70.1	98.1	28.0
Medicare Part A (HI)	FI	0.1	23.6	38.3	14.5	0.1	43.1	86.0	42.8
	GI	0.1	8.0	24.3	16.1	0.1	16.8	38.3	21.3
	FI-GI	0.0	15.6	14.0	-1.6	0.0	26.2	47.7	21.4
Social Security and Medicare Part A (OASDHI)	FI	3.0	86.8	126.2	36.3	3.0	159.7	269.4	106.6
	GI	3.0	31.1	80.3	46.1	3.0	63.4	123.6	57.2
	FI-GI	0.0	55.7	45.9	-9.8	0.0	96.3	145.8	49.5
		As a percent of the present value of GDP							
		75-Year Horizon (2021-2095)				Infinite Horizon (2021...)			
		Trust Fund	Receipts	Expenditures	Fiscal imbalance	Trust Fund	Receipts	Expenditures	Fiscal imbalance
Social Security (OASDI)	FI	0.2	4.9	6.8	1.7	0.1	4.8	7.6	2.7
	GI	0.2	1.8	4.3	2.3	0.1	1.9	3.5	1.5
	FI-GI	0.0	3.1	2.5	-0.6	0.0	2.9	4.1	1.2
Medicare Part A (HI)	FI	0.0	1.8	2.9	1.1	0.0	1.8	3.6	1.8
	GI	0.0	0.6	1.9	1.2	0.0	0.7	1.6	0.9
	FI-GI	0.0	1.2	1.1	-0.1	0.0	1.1	2.0	0.9
Social Security and Medicare Part A (OASDHI)	FI	0.2	6.7	9.7	2.8	0.1	6.6	11.2	4.4
	GI	0.2	2.4	6.2	3.5	0.1	2.6	5.1	2.4
	FI-GI	0.0	4.3	3.5	-0.8	0.0	4.0	6.0	2.1

\* Present values calculated at a nominal discount rate of 4.4 percent.

Source: Authors' calculations.

Since all OASDHI receipts and expenditures can be allocated to each birth cohort, it is possible to decompose OASDHI's Fiscal Imbalance (FI) into that arising from past and currently alive generations, called the "Generational Imbalance" (GI).<sup>5</sup> The remainder, FI *minus* GI, is the amount of the Fiscal Imbalance that arises from providing larger benefits relative to receipts from future generations who are not yet born (FI – GI). In other words:

$$\text{Fiscal Imbalance} = \text{Generational Imbalance (GI)} + (\text{FI} - \text{GI})$$

Table 2 shows this decomposition for OASDHI as a whole and separately for OASDI (Social Security and Disability) and HI (Medicare Part-A). The permanent Fiscal Imbalance ("FI") for OASDHI equals \$106.6 trillion over the infinite horizon, equal to the sum of \$63.9 trillion on account of Social Security and \$42.8 trillion on account of Medicare Part A.

Of this \$106.6 trillion Fiscal Imbalance for OASDHI, current and past generations contributed a total of \$57.2 trillion ("GI") by receiving (or will receive) benefits in excess of taxes that they paid (or will pay) under current law. This Generational Imbalance of \$57.2 trillion can be further decomposed into \$35.8 trillion for Social Security and \$21.3 trillion for Medicare Part A.

Future generations are projected to contribute \$49.5 trillion ("FI - GI") to the \$106.6 trillion Fiscal Imbalance for OASDHI. Of this, \$49.5 trillion is the amount that future generations are projected to receive in excess of taxes that they will pay under current law. This amount can be decomposed into \$28.0 trillion for Social Security and \$21.4 trillion for Medicare Part A.

## Comparison with Traditional Metrics

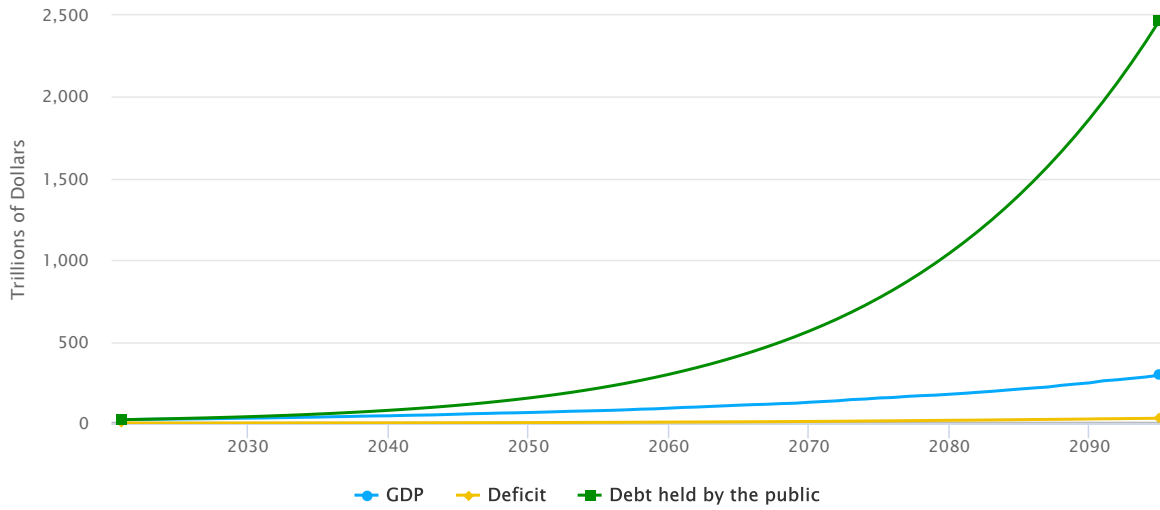


# Figure 1: Federal Deficits and Debt held by the public

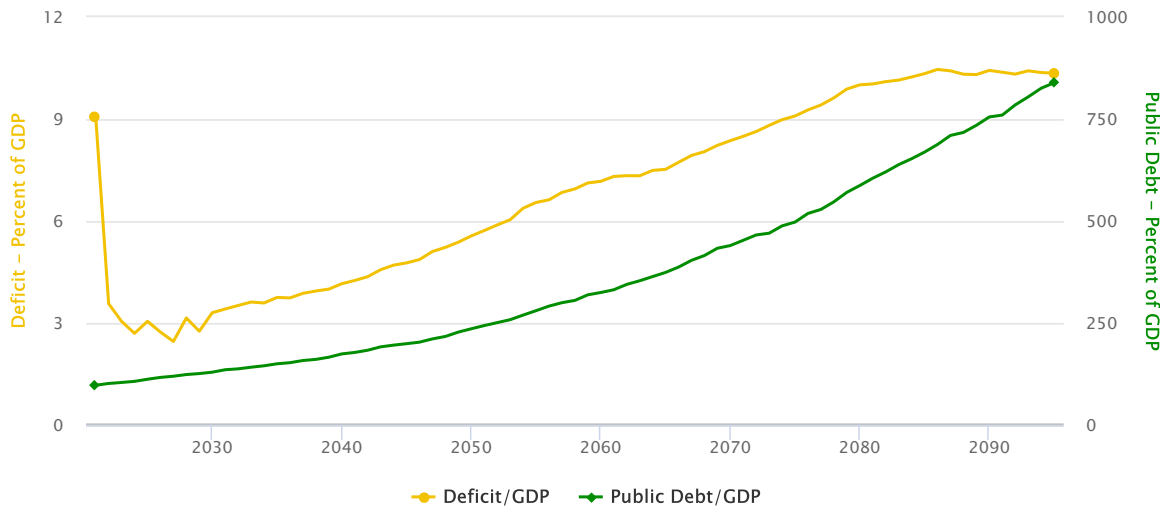
(In trillions of dollars and as a percent of projected GDP)

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### Projected U.S. Annual GDP, Deficit, and Debt held by the public – 2021–95



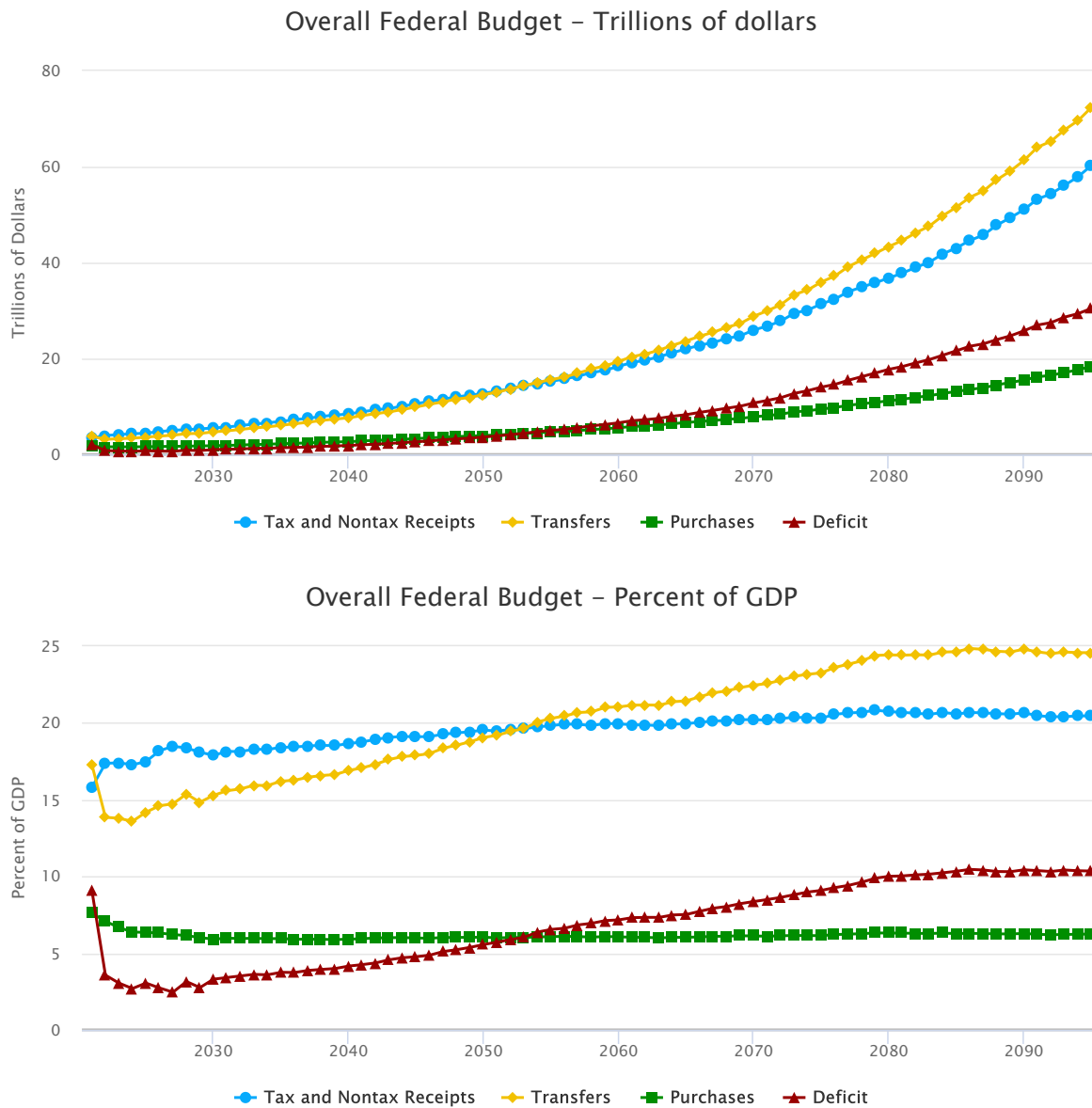
### Projected Debt Held by the Public As a Share of GDP – 2021–95



## Figure 2: Receipts, Transfers, Purchases, and Deficits

(In trillions of dollars and as a percent of projected GDP)

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As comprehensive measures, the Fiscal Imbalance and Generational Imbalances cannot be as easily “gamed” as the traditional debt measure. It is well known in the economics profession that a large portion of the official government debt can be mechanically reduced---all without changing the actual required transfers of resources from future to current generations---using pay-as-you-go (“paygo”) financing. Paygo financing, in fact, is the primary funding mechanism in the OASDIHI entitlement programs discussed above. Since the FI and GI measures are comprehensive, they are robust (will not change) to a simple “renaming” of transfers.

Still, given its well established tradition, Figure 1 also reports the projected evolution of total federal debt under current law (with sunsets in TCJA). Notice that Federal debt held by the public is projected to increase from its

2021 value of \$21.4 trillion (97.3 percent of GDP) to \$154.3 trillion (235.7 percent of GDP) by the year 2050. At the end of 75 years (2095) federal debt under current laws would be 838.9 percent of GDP.

Figure 2 provides more decomposition of these results. It shows projected federal receipts, transfers, public purchases, and deficits (transfers plus public purchases minus receipts) under current laws. As federal purchases plus transfers exceed federal receipts in every year through 2095, the deficit is positive. The decline during the first year (2021) is from reduced Covid-19 related expenditures. The secular increase in annual deficits through 2095 are driven in part by faster growth in federal health care expenditures and the aging of the U.S. population. Aging implies that more people will become eligible for benefits from transfer programs such as Social Security, Medicare, Medicaid, Supplemental Security Income, and others. By 2095, the federal annual deficit as a share of 2095 GDP is projected to be 10.3 percent.

Brief based on work by [Agustin Diaz](#), [Jagadeesh Gokhale](#), and [Kent Smetters](#). Prepared for the website by [Mariko Paulson](#).

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1. A private firm would generally report a measure like a “shutdown” liability that includes pension and retiree health obligations against its assets, which does not include future receipts that assume the firm as an ongoing concern. Shortfalls produced using shutdown metrics are typically larger than the Fiscal Imbalance that we calculate that incorporate future revenue. Government physical assets (e.g., military, public lands, air traffic control towers) are generally excluded from these calculations because the government would still need to provide these services in the future. If the government sold these assets today, it would have to lease back these or similar assets, creating a wash in present value in perpetuity. ↩
  2. Numerous academic studies reject the notion that the U.S. economy is *dynamically inefficient*, where GDP and tax receipts permanently grow at a rate that is larger than the government’s long-run borrowing rate. Nonetheless, if this situation hypothetically occurred and the government tried to roll over its debt indefinitely, the permanent FI-GDP present value ratio would fall to zero as the present value of future GDP approaches infinity. ↩
  3. A link to PWBM’s detailed (technical) description of its microsimulation model is available at <https://budgetmodel.wharton.upenn.edu/microsim>. ↩
  4. The numbers may not add up to totals because of rounding errors. ↩
  5. For programs with dedicated payroll tax revenue, HI is sometimes also called the “open group” shortfall while GI is sometimes called the “closed group” shortfall. ↩