

Fiscal Policy: A Summing Up

CHAPTER 26

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Fiscal Policy: What You Have Learned and Where



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In this chapter we look further at the implications of the budget constraint facing the government and discuss current issues of fiscal policy in the US.

26-1 The Government Budget Constraint

Suppose that, starting from a balanced budget, the government cuts taxes, creating a budget deficit. What will happen to debt over time? Will the government need to increase taxes later? If so, by how much?

26-1 The Government Budget Constraint

The Arithmetic of Deficits and Debt

- The budget deficit in year t equals:

$$deficit_t = rB_{t-1} + G_t - T_t$$

- B_{t-1} is government debt at the end of year, $t-1$ or, equivalently, at the beginning of year t ; r is the real interest rate, which we shall assume to be constant here. Thus rB_{t-1} equals the real interest payments on the government debt in year t .
- G_t is government spending during year t .
- T_t is taxes minus transfers during year t .

In words: The budget deficit equals spending, including interest payments on the debt, minus taxes net of transfers.

26-1 The Government Budget Constraint

The Arithmetic of Deficits and Debt

Note two characteristics of $deficit_t = rB_{t-1} + G_t - T_t$:

- We measure interest payments as real interest payments rather than as actual interest payments. The correct measure of the deficit is sometimes called the **inflation-adjusted deficit**.
- G does not include transfer payments.

26-1 The Government Budget Constraint

The Arithmetic of Deficits and Debt

The **government budget constraint** states that the *change in government debt during year t* is equal to the *deficit during year t*.

$$B_t - B_{t-1} = Deficit_t$$

Using the definition of the deficit

$$deficit_t = rB_{t-1} + G_t - T_t$$

we can rewrite the government budget constraint as

$$B_t - B_{t-1} = rB_{t-1} + G_t - T_t$$

26-1 The Government Budget Constraint

The Arithmetic of Deficits and Debt

It is often convenient to decompose the deficit into the sum of two terms:

- Interest payments on the debt, rB_{t-1}
- The difference between spending and taxes, $G_t - T_t$. This term is called the **primary deficit** (equivalently, $T_t - G_t$ is called the **primary surplus**).

26-1 The Government Budget Constraint

The Arithmetic of Deficits and Debt

Using this decomposition, we can rewrite

$$B_t - B_{t-1} = rB_{t-1} + G_t - T_t$$

$$\begin{array}{ccccc} \text{Change in the debt} & & \text{Interest payments} & & \text{Primary deficit} \\ \underbrace{B_t - B_{t-1}} & = & \underbrace{rB_{t-1}} & + & \underbrace{G_t - T_t} \end{array}$$

$$B_t = (1 + r)B_{t-1} + \underbrace{G_t - T_t}_{\text{Primary Deficit}}$$

Inflation Accounting and the Measurement of Deficits



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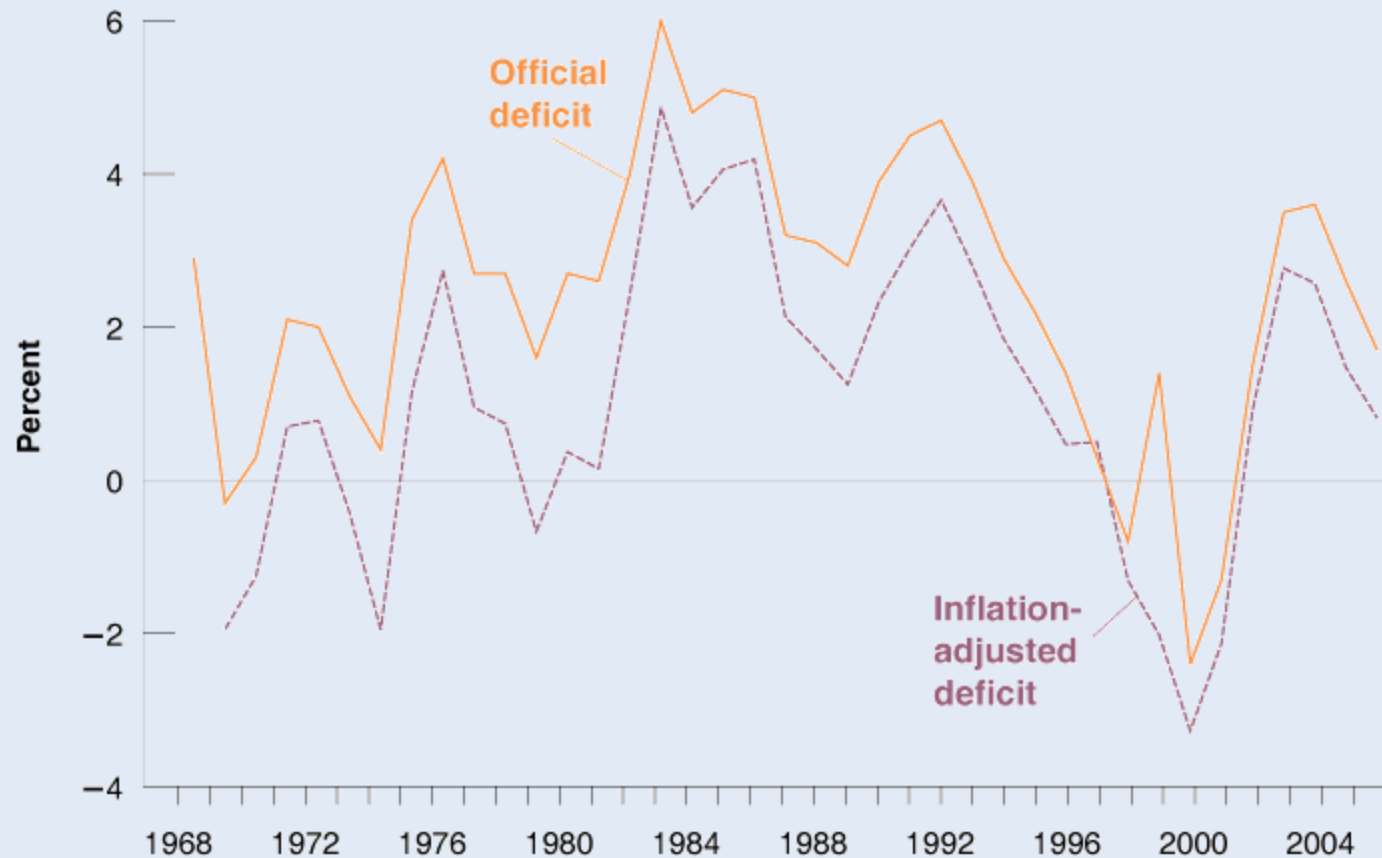


Figure 1 *Official and Inflation-Adjusted Federal Budget Deficits for the United States since 1968*

26-1 The Government Budget Constraint

Current versus Future Taxes

Let's look at the implications of a 1-year decrease in taxes for the path of debt and future taxes.

We start with a balanced budget, and end the year with the government decreasing taxes by 1 for 1 year. What happens thereafter?

26-1 The Government Budget Constraint

Current versus Future Taxes

Full Repayment in Year 2

$$B_2 = (1 + r)B_1 + (G_2 - T_2)$$

Replacing $B_2=0$ and $B_1=1$, and rearranging:

$$T_2 - G_2 = (1 + r)1 = (1 + r)$$

In words, to repay the debt fully in year 2, the government must run a primary surplus equal to $(1+r)$.

26-1 The Government Budget Constraint

Current versus Future Taxes

Full Repayment in Year 2

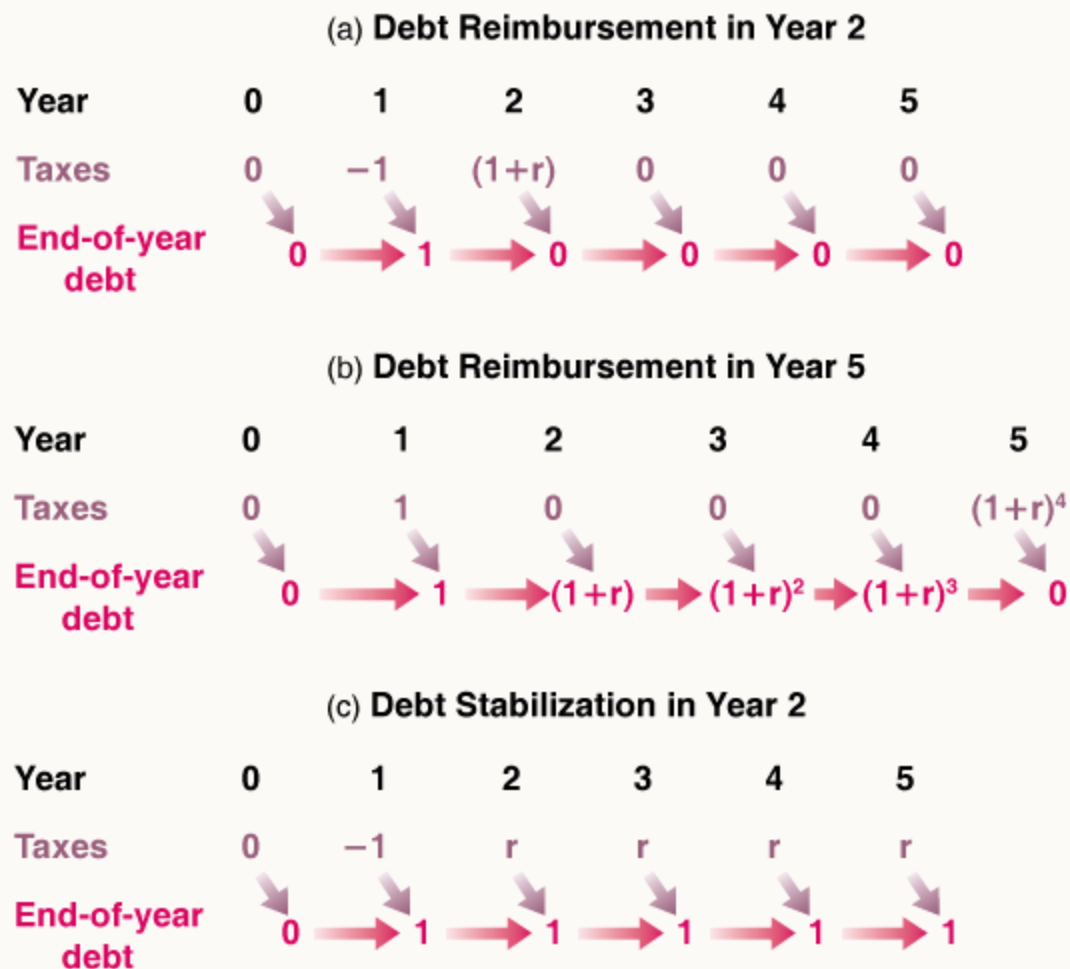
Figure 26 – 1

Tax Cuts, Debt Repayment, and Debt Stabilization

(a) If the debt is fully repaid during year 2, the decrease in taxes of 1 in year 1 requires an increase in taxes equal to $(1+r)$ in year 2.

(b) If the debt is fully repaid during year 5, the decrease in taxes of 1 in year 1 requires an increase in taxes equal to $(1+r)^4$ during year 5.

(c) If the debt is stabilized from year 2 on, then taxes must be permanently higher by r from year 2 on.



26-1 The Government Budget Constraint

Current versus Future Taxes

Full Repayment in Year t

Debt at the end of year $t-1$ is given by:

$$B_{t-1} = (1 + r)^{t-2}$$

In year t , when the debt is repaid, the budget constraint is:

$$B_t = (1 + r)B_{t-1} + (G_t - T_t)$$

Debt at the end of year t equals zero:

$$0 = (1 + r)(1 + r)^{t-2} + (G_t - T_t)$$

which implies that the necessary surplus in year t to repay the debt must be:

$$T_t - G_t = (1 + r)^{t-1}$$

26-1 The Government Budget Constraint

Current versus Future Taxes

Full Repayment in Year t

Our first set of conclusions:

- If government spending is unchanged, a decrease in taxes must eventually be offset by an increase in taxes in the future.
- The longer the government waits to increase taxes, or the higher the real interest rate, the higher the eventual increase in taxes.

26-1 The Government Budget Constraint

Current versus Future Taxes

Debt Stabilization in Year t

From $B_t = (1 + r)B_{t-1} + \overbrace{G_t - T_t}^{\text{Primary Deficit}}$, the budget constraint for year 2 is

$$B_2 = (1 + r)B_1 + (G_2 - T_2)$$

Under our assumption that debt is stabilized in year 2, $B_2 = B_1 = 1$. Replacing in the preceding equation:

$$1 = (1 + r) + (G_2 - T_2)$$

Reorganizing and bringing $G_2 - T_2$ to the left side:

$$T_2 - G_2 = (1 + r) - 1 = r$$

26-1 The Government Budget Constraint

Current versus Future Taxes

Debt Stabilization in Year t

From the preceding arithmetic of deficits and debt we can draw these conclusions:

- If government spending is unchanged, a decrease in taxes must eventually be offset by an increase in taxes in the future.
- The longer the government waits to increase taxes or the higher the real interest rate, the higher the eventual increase in taxes.

26-1 The Government Budget Constraint

Current versus Future Taxes

Debt Stabilization in Year t

From the preceding arithmetic of deficits and debt we can draw these conclusions:

- The legacy of past deficits is higher government debt.
- To stabilize the debt, the government must eliminate the deficit.
- To eliminate the deficit, the government must run a primary surplus equal to the interest payments on the existing debt. This requires higher taxes forever.

26-1 The Government Budget Constraint

The Evolution of the Debt-to-GDP Ratio

In an economy in which output grows over time, it makes sense to focus on the *ratio of debt to output*.

The **debt-to-GDP ratio**, or **debt ratio** gives the evolution of the ratio of debt to GDP.

26-1 The Government Budget Constraint

The Evolution of the Debt-to-GDP Ratio

The Arithmetic of the Debt Ratio

To derive the evolution of the debt ratio takes a few steps.
Do not worry: The final equation is easy to understand.

$$\frac{B_t}{Y_t} = (1 + r) \frac{B_{t-1}}{Y_t} + \frac{G_t - T_t}{Y_t}$$

$$\frac{B_t}{Y_t} = (1 + r) \left(\frac{Y_{t-1}}{Y_t} \right) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

$$\frac{B_t}{Y_t} = (1 + r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

26-1 The Government Budget Constraint

The Evolution of the Debt-to-GDP Ratio

The Arithmetic of the Debt Ratio

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

This took many steps, but this final relation has a simple interpretation: The change in the debt ratio over time is equal to the sum of two terms.

- The first term is the difference between the real interest rate and the growth rate times the initial debt ratio.
- The second term is the ratio of the primary deficit to GDP.

26-1 The Government Budget Constraint

The Evolution of the Debt-to-GDP Ratio

The Evolution of the Debt Ratio in OECD Countries

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

This equation implies that the increase in the ratio of debt to GDP will be larger:

- the higher the real interest rate,
- the lower the growth rate of output,
- the higher the initial debt ratio,
- the higher the ratio of the primary deficit to GDP.

26-1 The Government Budget Constraint

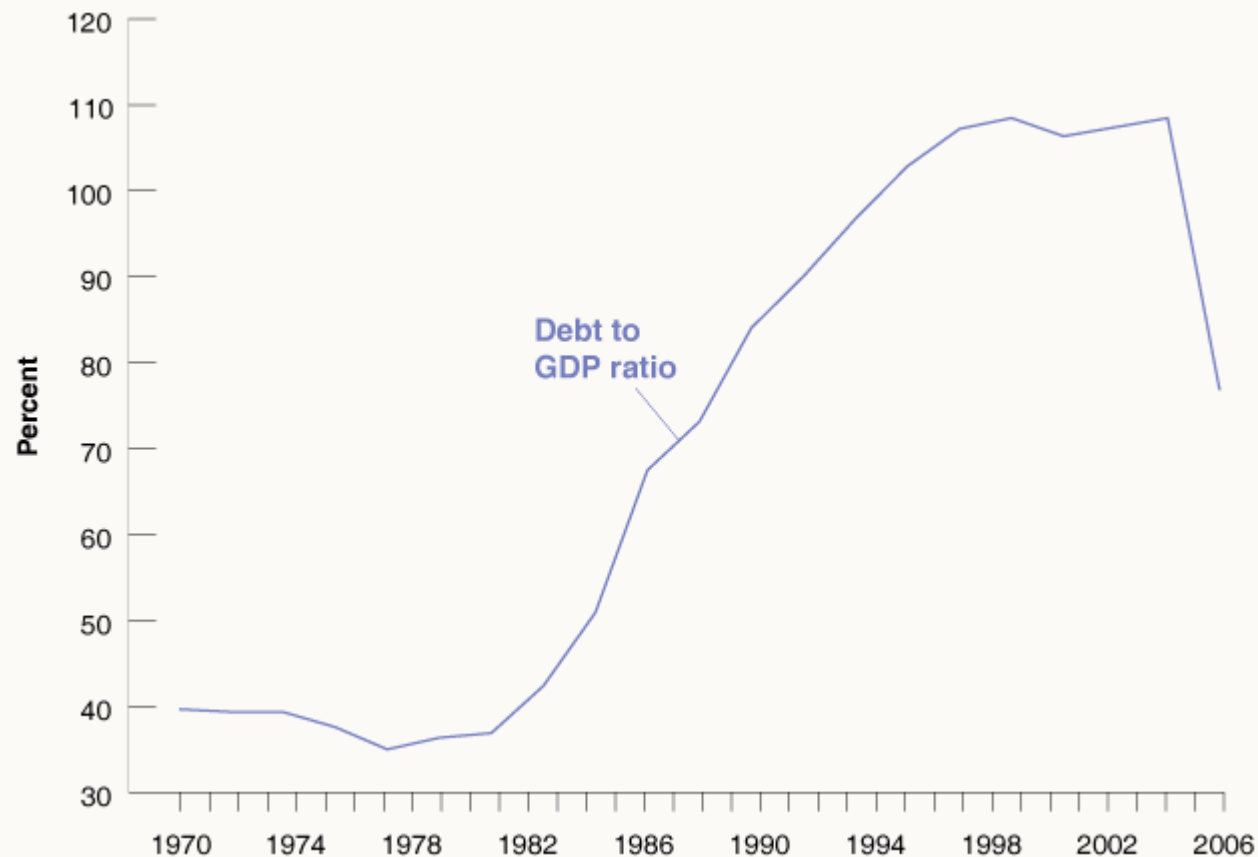
The Evolution of the Debt-to-GDP Ratio

The Evolution of the Debt Ratio in OECD Countries

■ **Figure 26 – 2**

The Belgian Debt Ratio since 1970

Low growth, high interest rates, and primary deficits led to a large increase in the debt ratio from the early 1980s to the mid-1990s. Since then, higher growth, lower interest rates, and primary surpluses have led to a decline in the debt ratio.



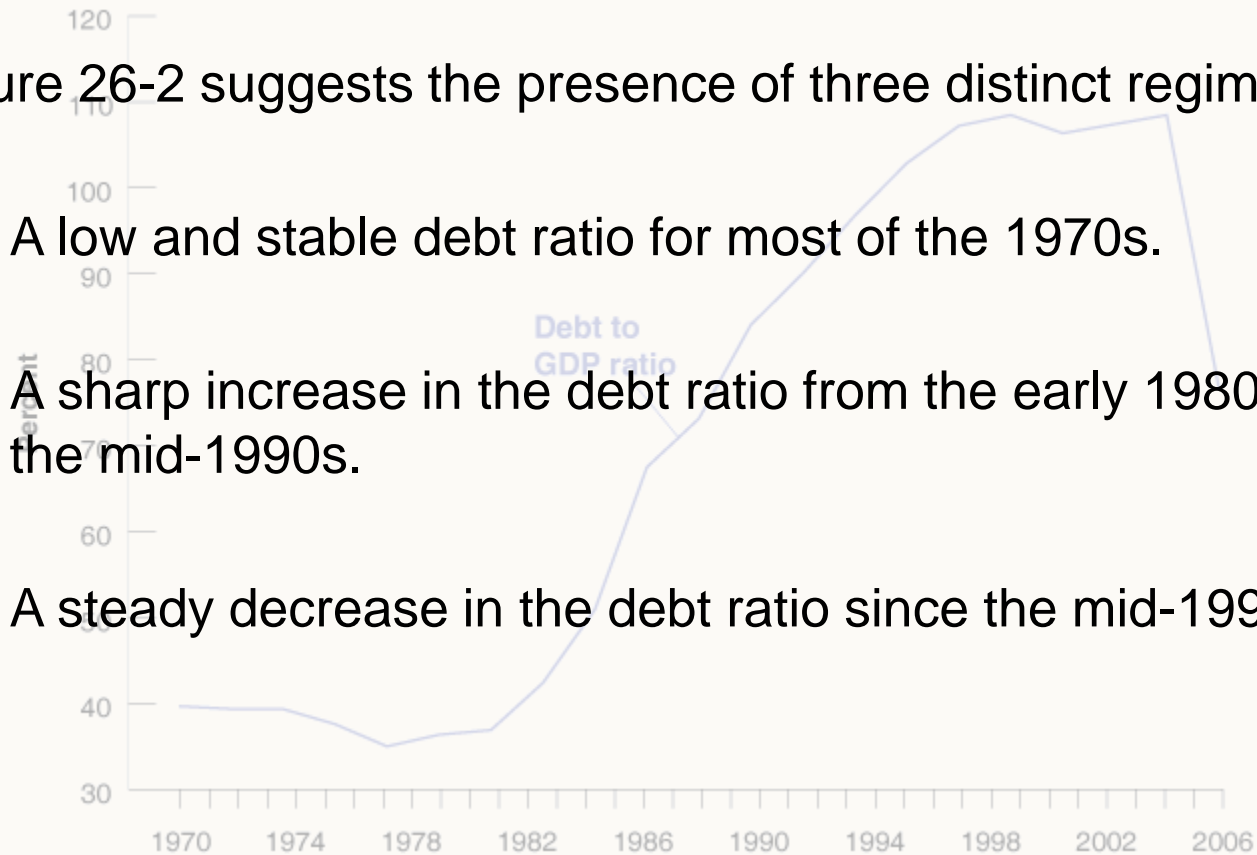
26-1 The Government Budget Constraint

The Evolution of the Debt-to-GDP Ratio

The Evolution of the Debt Ratio in OECD Countries

Figure 26-2 suggests the presence of three distinct regimes:

- A low and stable debt ratio for most of the 1970s.
- A sharp increase in the debt ratio from the early 1980s to the mid-1990s.
- A steady decrease in the debt ratio since the mid-1990s.



26-2 Four Issues in Fiscal Policy

Having looked at the mechanics of the government budget constraint, we can now take up four issues in which this constraint plays a central role.

Ricardian Equivalence

The **Ricardian Equivalence**, further developed by Robert Barro, and also known as the **Ricardo-Barro proposition**, is the argument that, once the government budget constraint is taken into account, neither deficit nor debt has an effect on economic activity.

Consumers do not change their consumption in response to a tax cut if the present value of after-tax labor income is unaffected. The effect of lower taxes today is cancelled out by higher taxes tomorrow.

26-2 Four Issues in Fiscal Policy

Deficits, Output Stabilization, and the Cyclically Adjusted Deficit

The fact that budget deficits have adverse effects implies that deficits during recessions should be offset by surpluses during booms.

The deficit that exists when output is at the natural level of output is called the **full-employment deficit**. Other terms used are **midcycle deficit**, **standardized employment deficit**, **structural deficit**, or **cyclically adjusted deficit**.

26-2 Four Issues in Fiscal Policy

Deficits, Output Stabilization, and the Cyclically Adjusted Deficit

The theory underlying the concept of cyclically adjusted deficit is simple; the practice of it has proven tricky. First, establish how much lower the deficit would be if output were, say, 1% higher. Second, assess how far output is from its natural level:

- A reliable rule of thumb is that a 1% decrease in output leads automatically to an increase in the deficit of 0.5% of GDP.

If output is, say 5% below its natural level, the deficit as a ratio of GDP will therefore be about 2.5% larger than it would be if output was at the natural level of output. This effect of the deficit on economic activity has been called the **automatic stabilizer**.

26-2 Four Issues in Fiscal Policy

Deficits, Output Stabilization, and the Cyclically Adjusted Deficit

The theory underlying the concept of cyclically adjusted deficit is simple; the practice of it has proven tricky. First, establish how much lower the deficit would be if output were, say, 1% higher. Second, assess how far output is from its natural level:

- The second step is more difficult. Recall that the natural level of output is the output level that would be produced if the economy were operating at the natural rate of unemployment. Too low an estimate will lead to too high an estimate of the natural level of output, and therefore to too optimistic a measure of the cyclically adjusted deficit.

26-2 Four Issues in Fiscal Policy

Wars and Deficits

The economic burden of a war affects consumers and firms differently depending on how the war is paid for.

There are two good reasons to run deficits during wars:

- The first is distributional—Deficit finance is a way to pass some of the burden of the war to those alive after the war, and it seems only fair for future generations to share in the sacrifices the war requires.
- The second is more narrowly economic—Deficit spending helps reduce tax distortions.

26-2 Four Issues in Fiscal Policy

Wars and Deficits

Passing on the Burden of the War

Wars lead to large increases in government spending.

- Suppose the government relies on deficit finance. With government spending sharply up, there will be a very large increase in the demand for goods.
- Suppose instead that the government finances the spending increase through an increase in taxes. Consumption will decline sharply.

26-2 Four Issues in Fiscal Policy

Wars and Deficits

Reducing Tax Distortions

Very high tax rates can lead to very high economic distortions. People will work less, and engage in illegal, untaxed activities.

Tax smoothing is the idea that it is better to maintain a relatively constant tax rate, to *smooth taxes*.

Tax smoothing implies large deficits when government spending is high and small surpluses the rest of the time.

26-2 Four Issues in Fiscal Policy

The Dangers of Very High Debt

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{(G_t - T_t)}{Y_t}$$

The higher the ratio of debt to GDP, the larger the potential for catastrophic debt dynamics.

Expectations of higher and higher debt give a hint that a problem may arise, which will lead to the emergence of the problem, thereby validating the initial expectations.

Debt repudiation consists of canceling the debt, in part or in full.

Deficits, Consumption, and Investment in the United States during World War II



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In 1939, the share of U.S. government spending on goods and services in GDP was 15%. By 1944, it had increased to 45%! The increase was due to increased spending on national defense, which went from 1% of GDP in 1939 to 36% in 1944.

Faced with such a massive increase in spending, the U.S. government reacted with large tax increases.

The increase was met in large part by a decrease in consumption.

It was also met however by a 6% decrease in the share of (private) investment in GDP—from 10% to 4%.

26-3 The U.S. Budget: Current Numbers and Future Prospects

Current Numbers

There are many different definitions of “*expenditures*,” “*revenues*,” and “*deficit*”:

- Some numbers refer to the budget of the federal government. Some numbers consolidate the accounts of the federal, state, and local governments.
- One set of numbers is based on the government accounting system; another set of numbers is based on the national income accounting system.

26-3 The U.S. Budget: Current Numbers and Future Prospects

Current Numbers

Here are the main differences between the government numbers and the NIPA numbers:

- The government budget numbers are presented by *fiscal year*.
- The government budget numbers are presented in two categories: “on-budget” and “off-budget.”
- The two accounting systems differ in how they treat the sale of government assets.
- They differ in the ways they treat government investment.
- The difference between the official and the NIPA measures of the deficit can be positive or negative.

26-3 The U.S. Budget: Current Numbers and Future Prospects

Current Numbers

You are likely to encounter two numbers for (federal) government debt:

- One is *gross debt*, the sum of the federal government's financial liabilities.
- The other, more relevant number is *net debt*, or equivalently, *debt held by the public*.

26-3 The U.S. Budget: Current Numbers and Future Prospects

Current Numbers

**Table 26-2 U.S. Federal Budget Revenues and Expenditures, Fiscal Year 2006
(Percent of GDP)**

Revenues	18.9		
Personal taxes		7.9	
Corporate profit taxes		2.9	
Indirect taxes		0.8	
Social insurance contribution		6.8	
Other		1.3	
Expenditures, excluding interest payments	18.4		
Consumption expenditures		6.1	
Defense			4.1
Nondefense			2.0
Transfers		8.9	
Grants to state/local governments		2.8	
Other		0.7	
Primary surplus (1) (+ sign: surplus)	0.5		
Net interest payments (2)	2.2		
Real interest payments (3)		0.8	
Inflation component		1.4	
Official surplus: (1) minus (2)	-1.7		
Inflation adjusted surplus: (1) minus (3)	-0.3		
Memo item. Debt-to-GDP ratio	37.0		

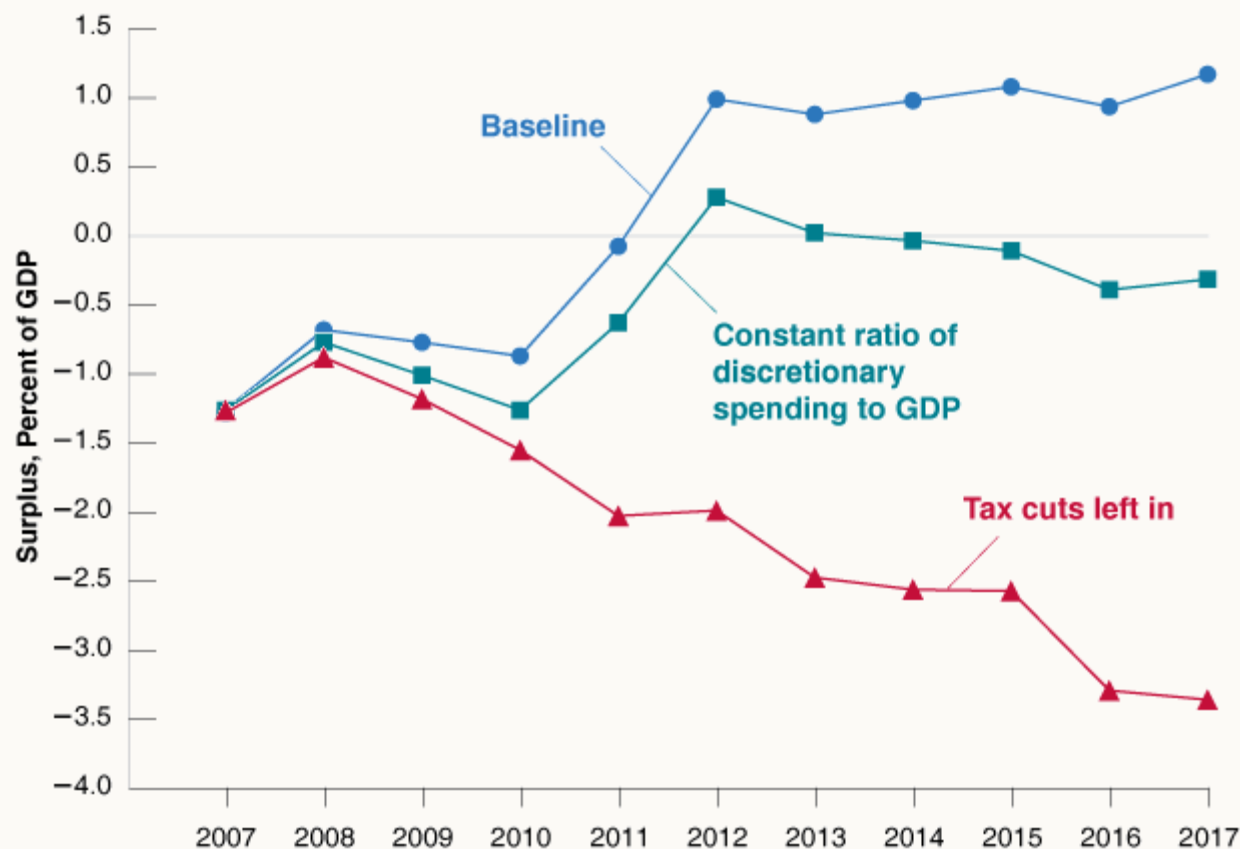
26-3 The U.S. Budget: Current Numbers and Future Prospects

Medium-Run Budget Projections

Figure 26 – 3

Deficits Projections: Federal Government Deficit, Fiscal Years 2007 to 2017

Under current fiscal rules, the deficit turns into a surplus by 2012. Under more realistic assumptions about spending and revenues, however, it increases steadily over the period.

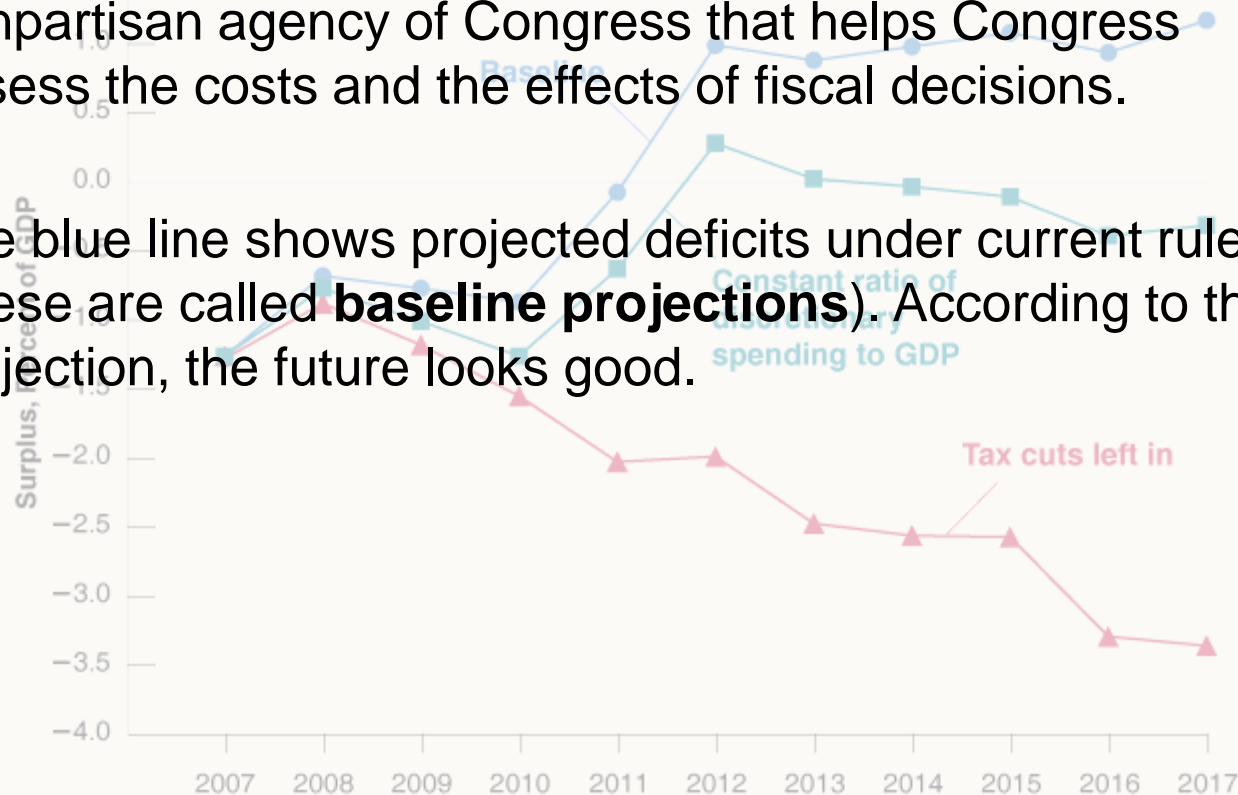


26-3 The U.S. Budget: Current Numbers and Future Prospects

Medium-Run Budget Projections

The **Congressional Budget Office** (or CBO for short) is a nonpartisan agency of Congress that helps Congress assess the costs and the effects of fiscal decisions.

The blue line shows projected deficits under current rules (these are called **baseline projections**). According to this projection, the future looks good.

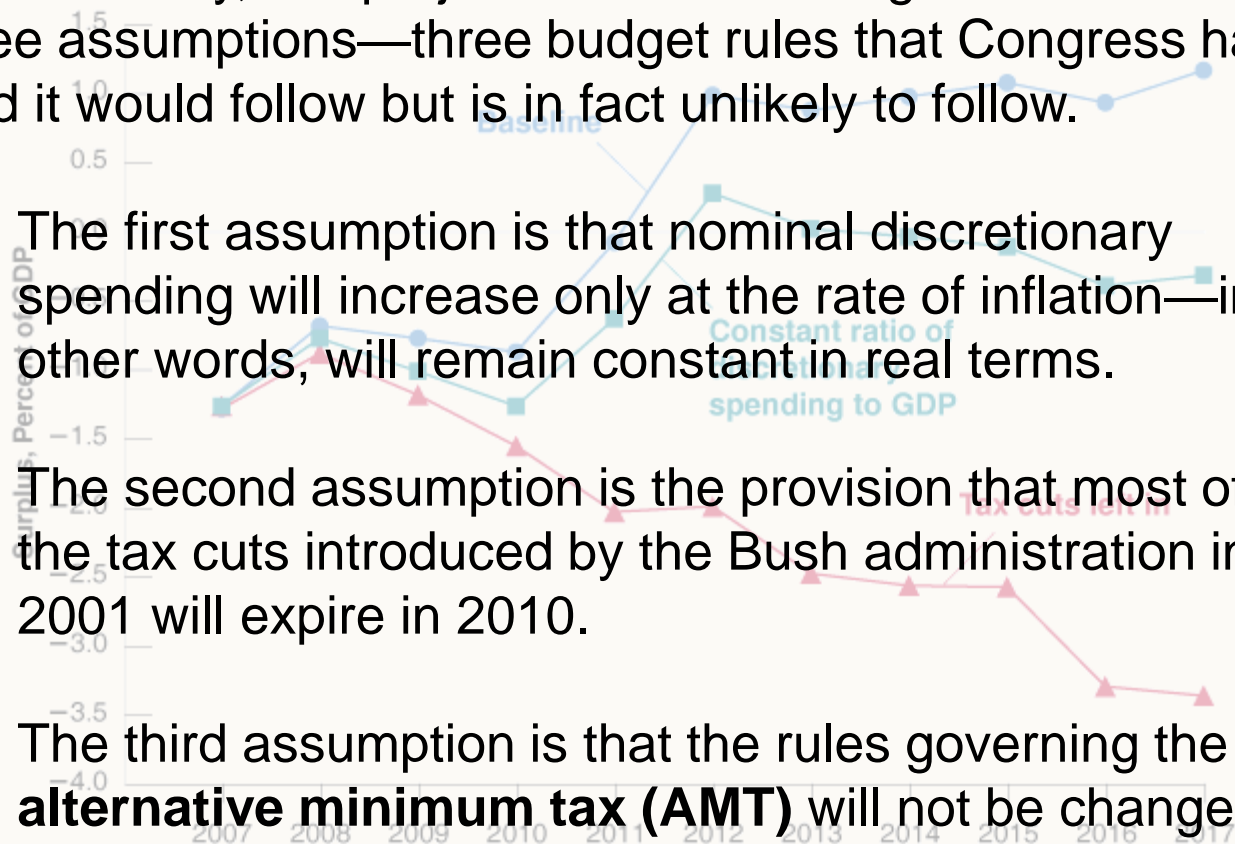


26-3 The U.S. Budget: Current Numbers and Future Prospects

Medium-Run Budget Projections

Unfortunately, this projection is misleading. It is based on three assumptions—three budget rules that Congress has said it would follow but is in fact unlikely to follow.

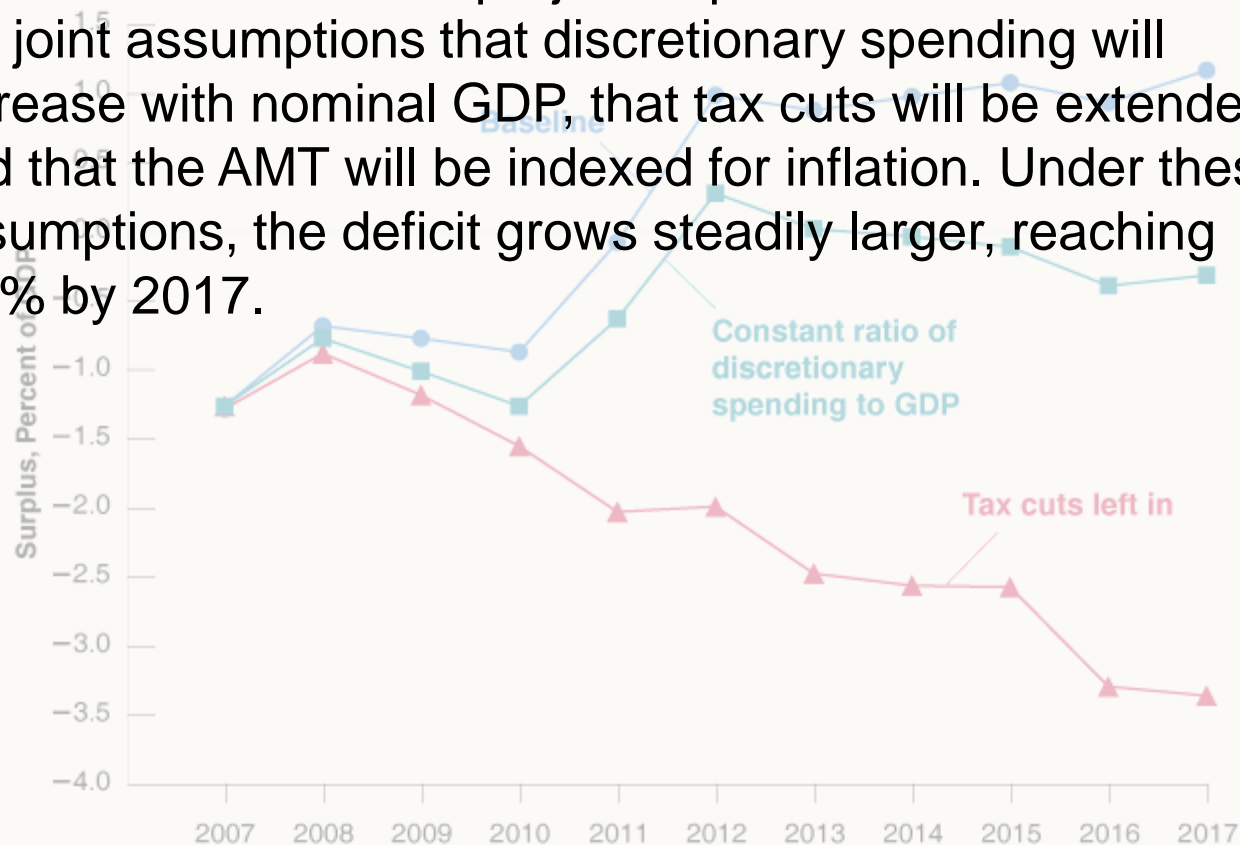
- The first assumption is that nominal discretionary spending will increase only at the rate of inflation—in other words, will remain constant in real terms.
- The second assumption is the provision that most of the tax cuts introduced by the Bush administration in 2001 will expire in 2010.
- The third assumption is that the rules governing the **alternative minimum tax (AMT)** will not be changed.



26-3 The U.S. Budget: Current Numbers and Future Prospects

Medium-Run Budget Projections

The red line shows the projected path of the deficit under the joint assumptions that discretionary spending will increase with nominal GDP, that tax cuts will be extended, and that the AMT will be indexed for inflation. Under these assumptions, the deficit grows steadily larger, reaching 3.5% by 2017.



26-3 The U.S. Budget: Current Numbers and Future Prospects

The Long-Run Challenges: Low Saving, Aging, and Medical Care

We just reached the conclusion that U.S. budget deficits are likely to remain high for at least the next decade. There are three reasons why we should worry: low U.S. saving, the aging of America, and the increase in medical costs.

26-3 The U.S. Budget: Current Numbers and Future Prospects

The Long-Run Challenges: Low Saving, Aging, and Medical Care

Deficits and the Low U.S. Saving Rate

The U.S. saving rate is among the lowest in the OECD.

This low saving rate should be a matter of concern. The U.S. is now the largest debtor country in the world and will have to pay large interest payments to the rest of the world for the indefinite future.

26-3 The U.S. Budget: Current Numbers and Future Prospects

The Long-Run Challenges: Low Saving, Aging, and Medical Care

Retirement and Medical Care

Entitlement programs are programs that require the payments of benefits to all who meet the eligibility requirements established by the law.

Table 26-3 Projected Spending on Social Security, Medicare, and Medicaid, 1998-2060 (Percent of GDP)

	2004	2010	2030	2050
Social Security	4.2	4.2	5.9	6.2
Medicare/Medicaid	4.1	4.8	8.4	11.5
Total	8.3	9.0	14.3	17.6

26-3 The U.S. Budget: Current Numbers and Future Prospects

The Long-Run Challenges: Low Saving, Aging, and Medical Care

Retirement and Medical Care

Entitlement spending to GDP is projected to increase for these reasons:

- *The Aging of America:* The *old age dependency ratio*—the ratio of the population 65 years old or more to the population between 20 and 64 years old—is projected to increase from about 20% in 1998 to above 40% in 2060.
- The steadily increasing cost of health care.

Even if all expenditures other than transfers were eliminated, projected entitlement spending would still exceed revenues.

26-3 The U.S. Budget: Current Numbers and Future Prospects

The Long-Run Challenges: Low Saving, Aging, and Medical Care

Retirement and Medical Care

Since 1983, Social Security contributions have exceeded benefits. The **Social Security Trust Fund** is an account where the surpluses have been accumulating, and now equal 15% of GDP.

The Social Security Trust Fund is expected to reach a peak by 2016 and then to decline and become equal to zero by 2041.

Key Terms

- inflation-adjusted deficit
- government budget constraint
- primary deficit (primary surplus)
- debt-to-GDP ratio, debt ratio
- Ricardian equivalence, Ricardo-Barro proposition
- full-employment deficit
- midcycle deficit
- standardized employment deficit
- structural deficit
- cyclically adjusted deficit
- automatic stabilizer
- tax smoothing
- debt repudiation
- Congressional Budget Office (CBO)
- baseline projections
- entitlement programs
- Social Security Trust Fund