

## Spending, Taxes, and the Budget Deficit

This lecture focuses on describing the impact of fiscal policy actions without analyzing whether or not these policies are good for the economy.

### Key Definitions

- A. The deficit (surplus) is the *annual* difference between government spending and government tax revenue.
- B. The debt is total sum of past deficits minus the total sum of past surpluses.

# Government Budgets

## A. The federal government budget.

### 1. Government spending or outlays

#### a. Purchases of goods and services

- i. They comprise less than  $1/3$  of federal outlays.
- ii. Defense spending comprises  $2/3$  of all government purchases.

#### b. Transfer payments

- i. These are direct payments to families, such as social security, welfare, etc., that are funded by other families through social security and personal income taxes.
- ii. This is the largest component of all government outlays.

c. Interest payments on the government debt are the third largest component of all government outlays.

## 2. Government receipts

a. Personal income taxes are the largest source of federal government revenue.

b. Social securities taxes are the second largest source of revenue and generate nearly as much revenue as personal income taxes do.

c. Corporate income taxes are the third largest source of revenue but generate less than 1/3 the revenue that personal income taxes do.

3. Over most of the last 45 years (except for the late 1990's), the federal government has run a budget deficit.

## B. The state and local government budgets.

### 1. Government spending or outlays

#### a. Purchases of goods and services

i. They comprise the largest part of state and local outlays.

ii. Education is by far the largest component of state and local spending and comprises  $\frac{1}{3}$  of all state and local purchases.

b. Transfer payments are the second largest source of state and local outlays but it comprises less than  $\frac{1}{2}$  of the resources spent on state and local purchases.

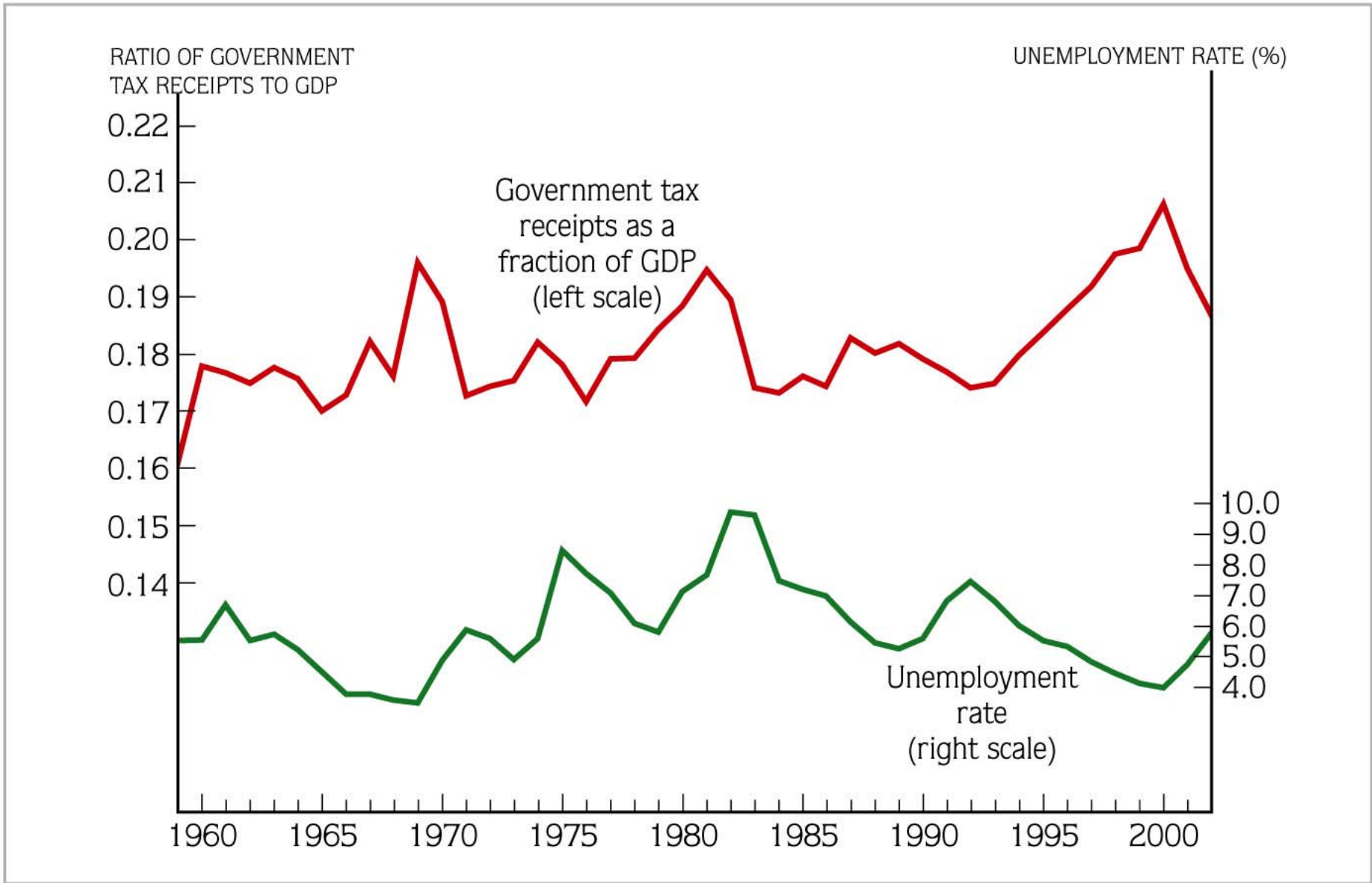
## 2. Government receipts

- a. Property and sales taxes make up almost 50% of state and local receipts.
- b. Grants from the federal government make up about 20% of state and local receipts.
- c. Personal income, corporate income, and payroll taxes are the other major sources of state and local receipts.

3. In most years, state and local governments break-even or run budget surpluses because many of these governments have balanced budget laws, which prevent them from running budget deficits.

## Business Cycle Fluctuations Effect on the Government's Budget

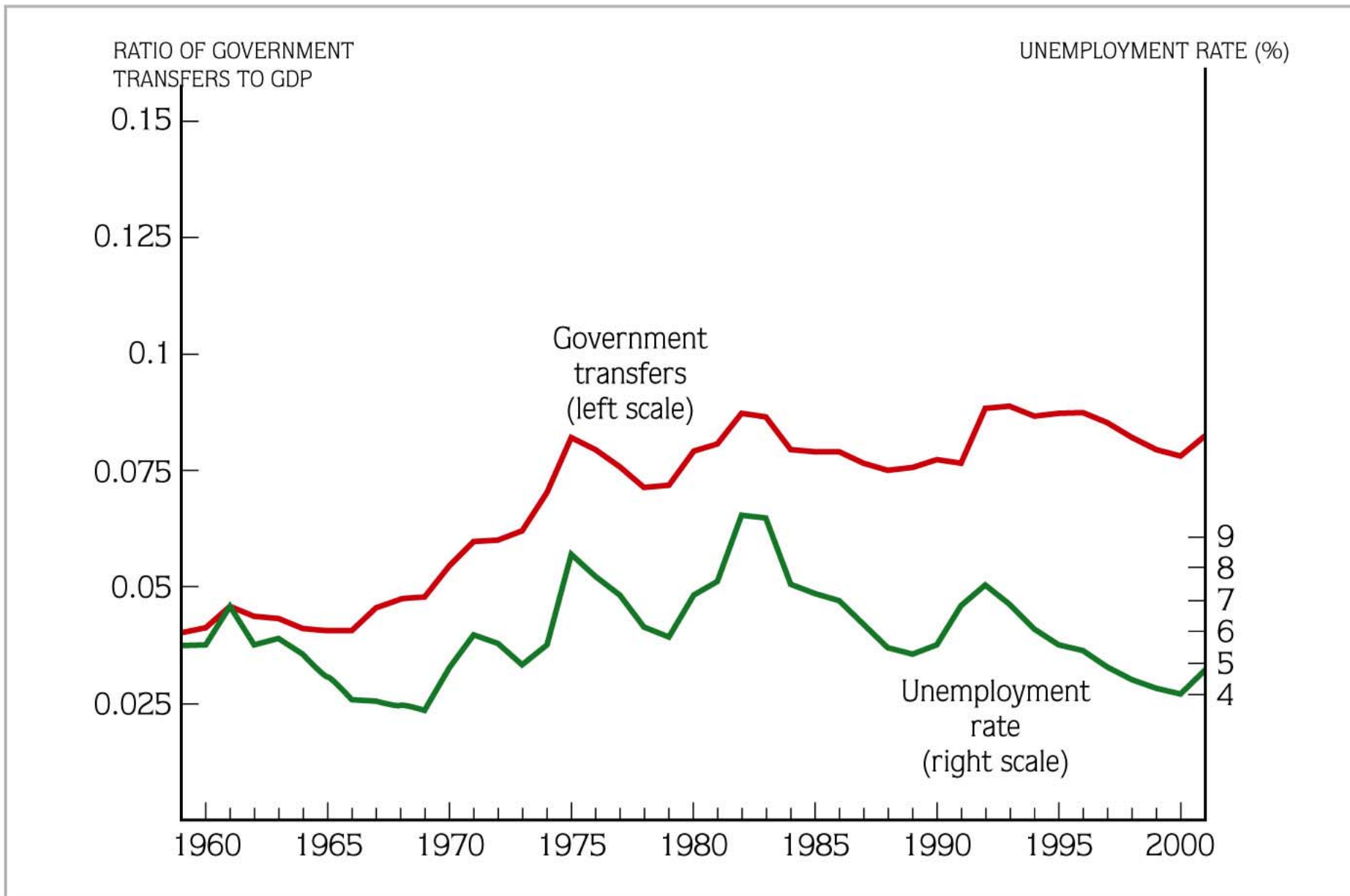
- A. Budget surplus (deficit) = taxes – government purchases – transfer payments – interest the on debt.
- B. Tax revenue moves procyclically with output. Often, the percent change in tax receipts is more than the percent change in output.
1. Recall,  $\text{taxes} = t \times Y$  in our model so that tax revenue will move with output.
  2. See Figure 13.3
  3. One reason why taxes fluctuate more than output is that the average tax rate ( $t$ ) automatically fluctuates with income (i.e., a rise in  $Y$  causes  $t$  to rise) because of the progressive income tax system in the U.S.
  4. Tax revenue also tends to move with output because the government frequently makes discretionary changes in tax law in order to increase output during recessions.



**FIGURE 13.3** Government Tax Receipts and Unemployment

- C. Government purchases do not respond very much to business cycle fluctuations. Instead, they respond most to changes in defense spending.
- D. Transfer payment move countercyclically in order to dampen fluctuations in the economy.
  1. Most transfer payment programs automatically increase as output falls without discretionary intervention by the government. For this reason, these programs are referred to as automatic stabilizers.
  2. Some examples of automatic stabilizers are unemployment insurance, food stamps, welfare programs, Medicare, and Social Security.
  3. See Figure 13.2





**FIGURE 13.2** Government Transfers and Unemployment

# The Effects of a Government Deficit

A. The federal government can finance its debt by issuing:

1. Interest-bearing bonds
2. Non-interest-bearing money

B. The deficit and the business cycle

1. The deficit tends to rise (fall) during recessions (expansions) as automatic stabilizers push up (down) government spending and as tax revenue falls (rises).
2. The full-employment or structural deficit is the size the deficit would be at if the economy were at full employment.
3. The cyclical deficit is the amount of deficit that is attributed to the deviation of output from its potential.
4. Actual budget deficit = structural deficit + cyclical deficit.

## 5. Example

Actual output:  $Y = 9,000$

Potential output:  $Y^* = 10,000$

Tax rate:  $t = 0.20$

Government spending:  $G = 900$

Transfer payments:  $F = 1,000 - 0.4 \times (Y - Y^*)$

Interest on the debt:  $R \times D = 500$

a. Calculate the actual budget deficit

$$\text{Actual BD} = G + F + R \times D - t \times Y$$

$$\begin{aligned} \text{Actual BD} &= 900 + 1,000 - 0.4 \times (9,000 - 10,000) + 500 \\ &\quad - 0.20 \times 9,000 \end{aligned}$$

$$\text{Actual BD} = 900 + 1,000 + 400 + 500 - 1,800$$

$$\text{Actual BD} = 2,800 - 1,800$$

$$\text{Actual BD} = 1,000.$$

b. Calculate the structural budget deficit

$$\text{Structural BD} = G + F + R \times D - t \times Y^*$$

$$\text{Structural BD} = 900 + 1,000 + 500 - 0.20 \times 10,000$$

$$\text{Structural BD} = 900 + 1,000 + 500 - 2,000$$

$$\text{Structural BD} = 2,400 - 2,000$$

$$\text{Structural BD} = 400.$$

c. Calculate the cyclical budget deficit

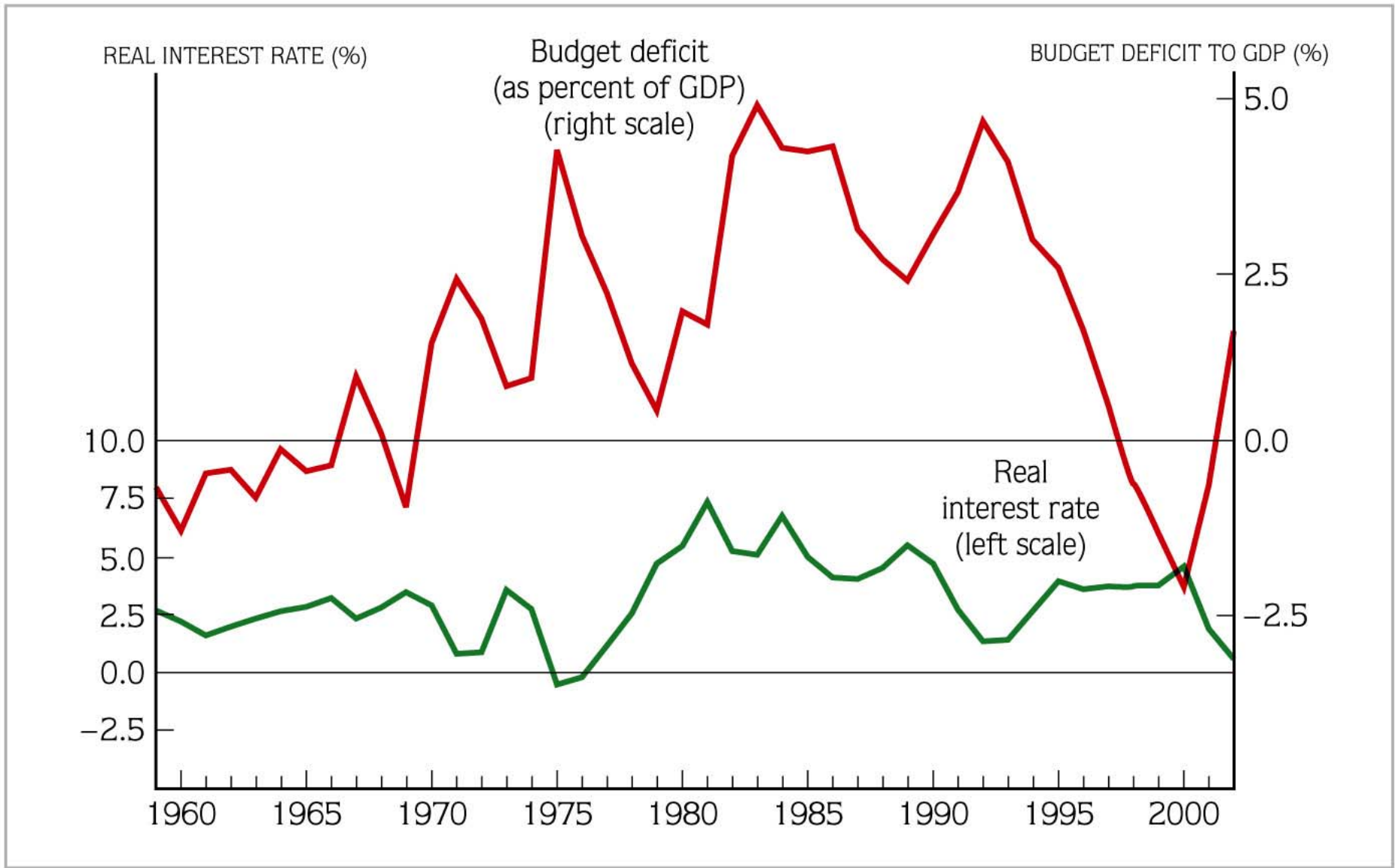
$$\text{Cyclical BD} = \text{Actual BD} - \text{Structural BD}$$

$$\text{Cyclical BD} = 1,000 - 400$$

$$\text{Cyclical BD} = 600.$$

## C. The deficit and interest rates

1. Our model says that an increase in the deficit reduces government savings which causes the interest rate to rise.
2. Empirical evidence, however, shows that interest rates tend to fall when the budget is in deficit. (see Figure 13.5)
3. There are two important things to note about this observed relationship.
  - a. When a shock pushes down the spending line, the IS curve shifts to the left and  $Y$  and  $R$  fall. The decline in  $Y$  causes transfer payments and the budget deficit to rise. This behavior could be the cause of the observed relationship between  $R$  and the budget deficit.
  - b. The large deficits of the 1980's were associated with high interest rates but the pattern was broken in 1991 and 1992 when the GDP fell below its potential.



**FIGURE 13.5** Budget Deficits and Real Interest Rates

## D. The deficit and the rise in governmental debt

### 1. The link between the deficit and the debt

#### a. Government's budget constraint equation

$$D_{+1} = D + R \times D + G + F - T$$

where  $D$  = Debt at the start of this year,  $D_{+1}$  = Debt at the start of next year,  $R$  = Interest rate,  $G$  = Government purchases,  $F$  = Transfer payments, and  $T$  = Taxes.

#### b. The current period budget deficit (BD)

$$BD = R \times D + G + F - T$$

such that

$$D_{+1} = BD + D$$

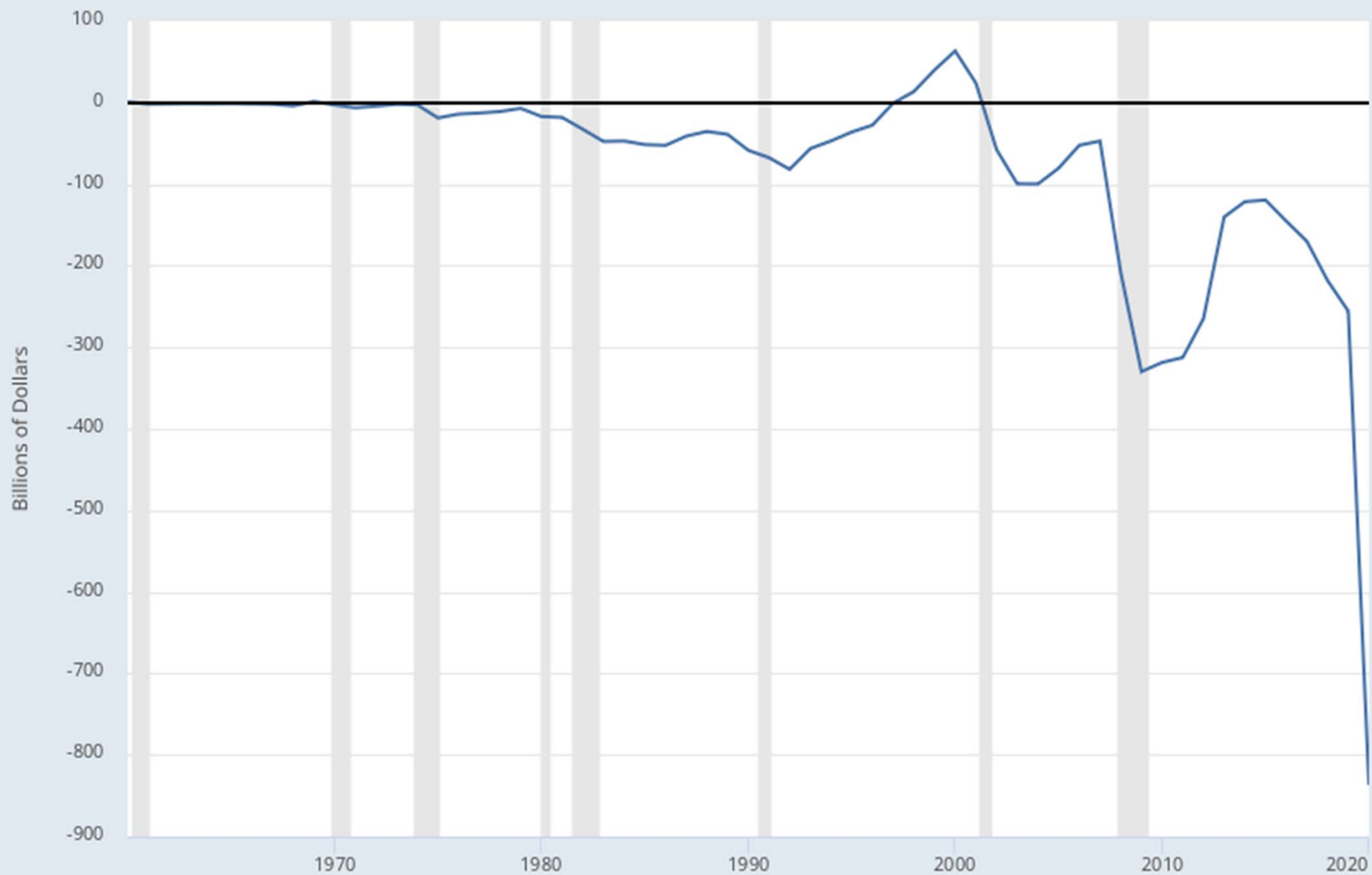
2. In order to gain a better perspective of the effect of the debt on the U.S. economy, economists examine the debt-to-GDP ratio.

3. Data on the federal deficit and the debt
  - a. During WWII, the government ran large deficits and accumulated a lot of debt.
  - b. From the end of WWII until the 1960s, the government ran surpluses in most years so the debt fell.
  - c. From mid 1960s to the end of the 1970's the government ran a deficit in most years but the debt-to-GDP ratio fell.
  - d. From 1980 until 1997, the government ran deficits that were large enough to push up the debt-to-GDP ratio.
  - e. From 1998-2001, the government ran a budget surplus.
  - f. Since 2002, deficits returned and the debt-to-GDP has risen.



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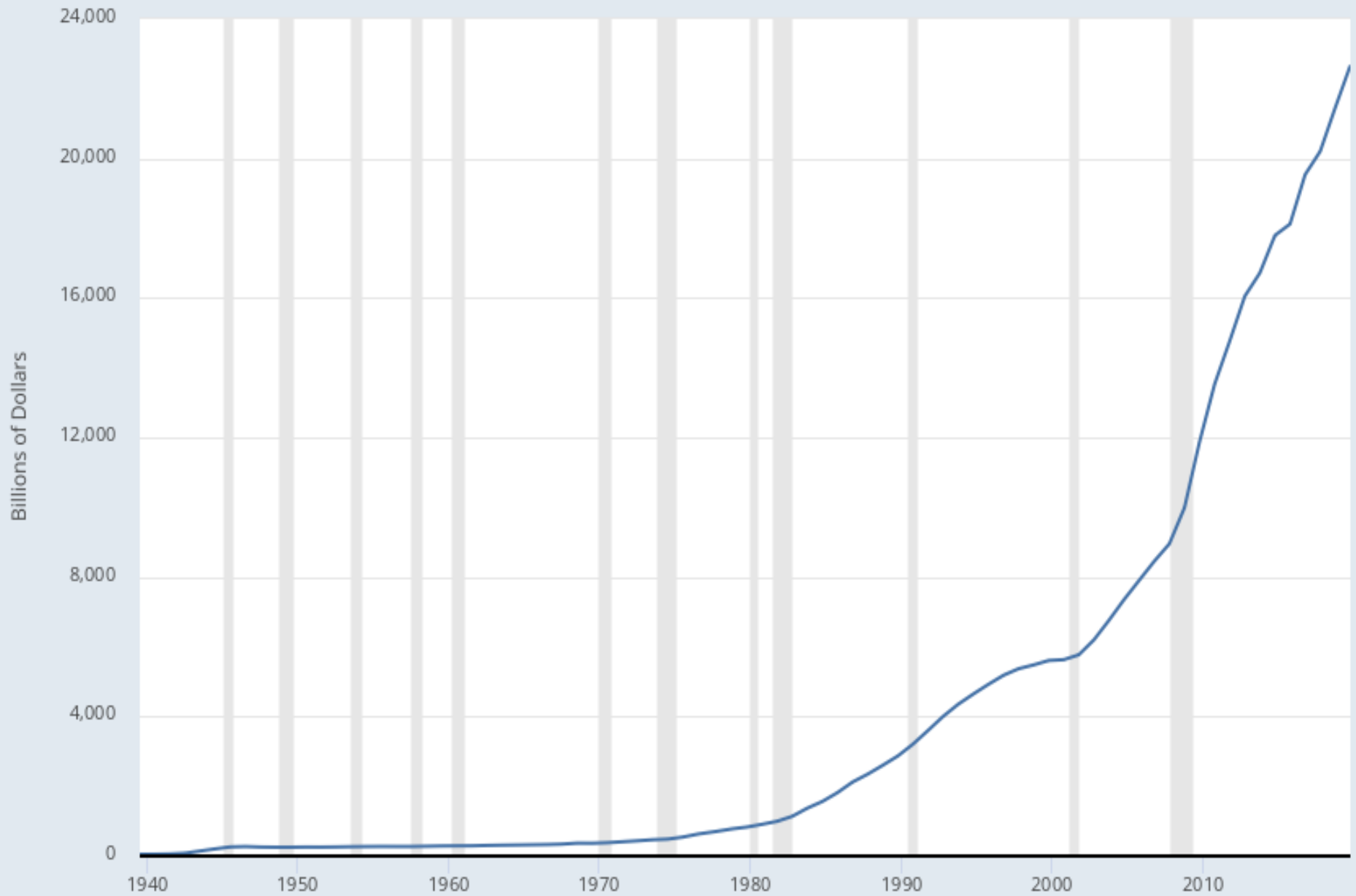
Federal government budget surplus or deficit (-)

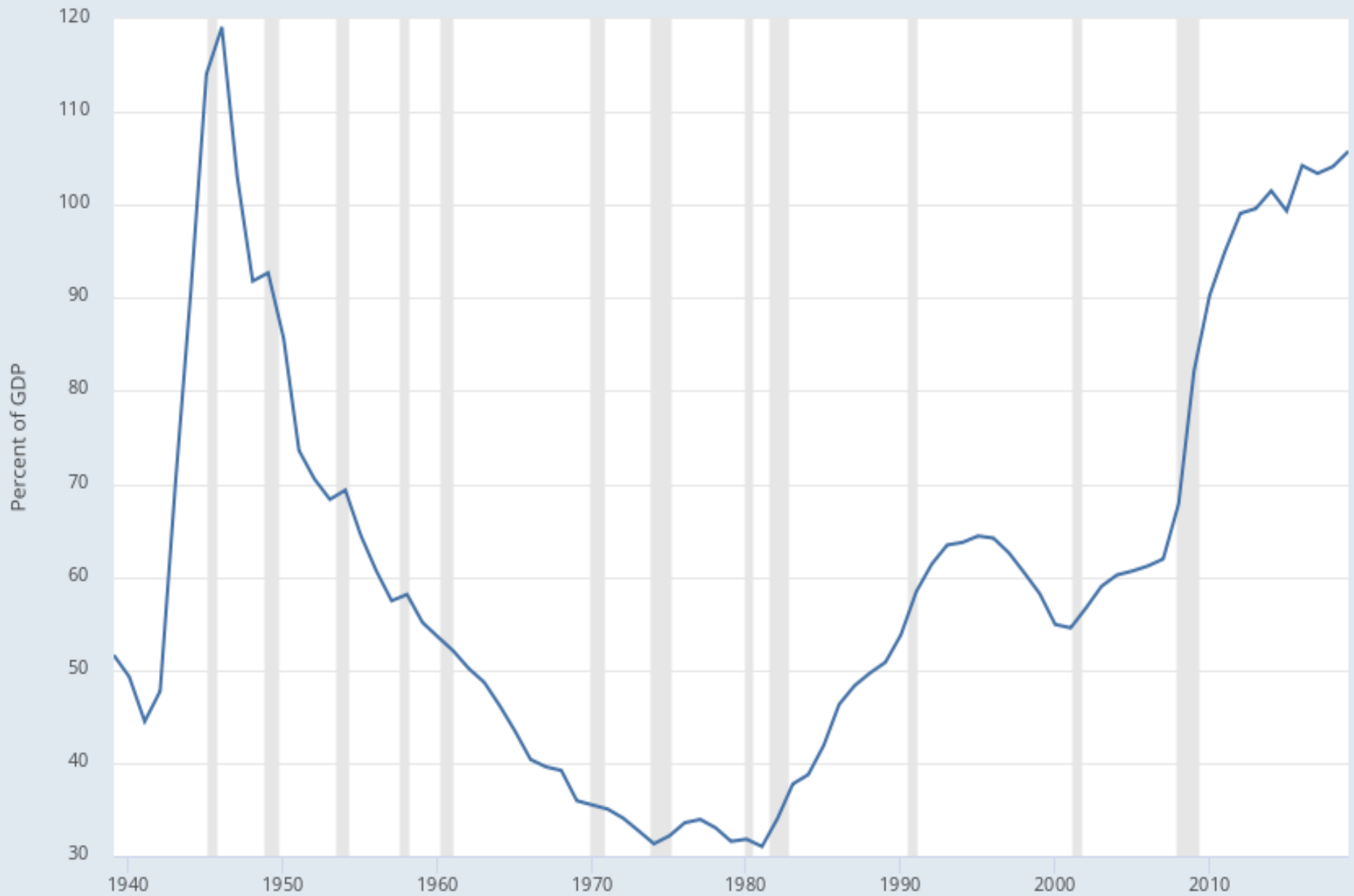


Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Economic Analysis

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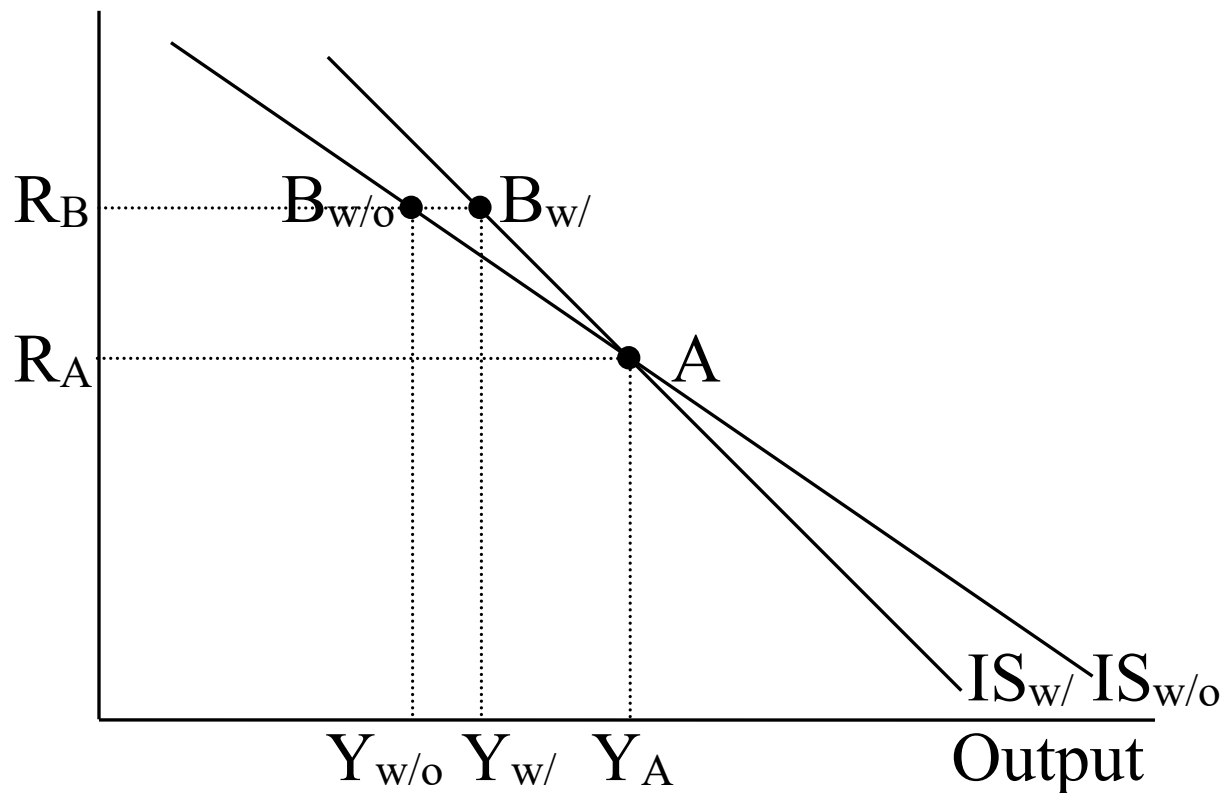


## The Government and the IS Curve

- A. Changes in government spending ( $G$ ) and taxes ( $T$ ) shift the IS curve.
1. An increase in  $G$  causes  $Y$  to rise and the IS curve to shift right.
  2. A decrease in  $T$  causes disposable income ( $Y_d$ ) to rise. Higher  $Y_d$  causes pushes up  $C$  which raises  $Y$  and shifts the IS curve right.
- B. Automatic stabilizers impact on the slope of the IS curve.
1. A rise in  $R$  causes  $I$  and  $(X - IM)$  to fall which pushes down  $C$  and  $Y$ . That generates a downward sloping IS curve.
  2. Automatic stabilizers respond to a fall in  $Y$  by automatically raising  $G$  which moderates the decline in  $C$  and  $Y$ . Thus, the presence of automatic stabilizers makes slope of IS curve steeper.

3. IS curve graph with (w/) and without (w/o) automatic stabilizers: The impact of an increase in R

Interest rate



a. Without automatic stabilizers:

$$[R \uparrow \rightarrow I \downarrow \ \& \ (X - IM) \downarrow \rightarrow Y \downarrow (B_{w/o})]$$

b. With automatic stabilizers:

$$[R \uparrow \rightarrow I \downarrow \ \& \ (X - IM) \downarrow \rightarrow Y \downarrow (B_{w/o}) \rightarrow G \uparrow \rightarrow Y \uparrow (B_{w/})]$$