Chapter 9
The Government and Fiscal Policy
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Chapter Outline and Learning Objectives (1 of 2)

9.1 Government in the Economy
• Discuss the influence of fiscal policies on the economy.

9.2 Fiscal Policy at Work: Multiplier Effects
• Describe the effects of three fiscal policy multipliers.

9.3 The Federal Budget
• Compare and contrast the federal budgets of three U.S. government administrations.
9.4 The Economy’s Influence on the Government Budget

- Explain the influence of the economy on the federal government budget.

Looking Ahead

Appendix A: Deriving the Fiscal Policy Multipliers

- Show that the government spending multiplier is 1 divided by 1 minus the MPC.

Appendix B: The Case in Which Tax Revenues Depend on Income

- Explain why the multiplier falls when taxes depend on income.
Chapter 9  The Government and Fiscal Policy

• In macroeconomics, the policy instruments are fiscal policy and monetary policy.

• **fiscal policy**  The government’s spending and taxing policies.

• **monetary policy**  The behavior of the Federal Reserve concerning the nation’s money supply.
Government in the Economy

• Taxes and government spending often go up or down in response to changes in the economy.

• **discretionary fiscal policy** Changes in taxes or spending that are the result of deliberate changes in government policy.
Government Purchases ($G$), Net Taxes ($T$), and Disposable Income ($Y_d$) (1 of 5)

- **net taxes ($T$)** Taxes paid by firms and households to the government minus transfer payments made to households by the government.

- **disposable, or after-tax, income ($Y_d$)** Total income minus net taxes: $Y - T$.

$$Y_d \equiv Y - T$$
FIGURE 9.1 Adding Net Taxes ($T$) and Government Purchases ($G$) to the Circular Flow of Income
Government Purchases ($G$), Net Taxes ($T$), and Disposable Income $Y_d$ (2 of 5)

\[
Y_d \equiv C + S
\]
\[
Y - T \equiv C + S
\]
\[
Y \equiv C + S + T
\]
\[
AE \equiv C + I + G
\]
• **budget deficit** The difference between what a government spends and what it collects in taxes in a given period: $G - T$.

\[
\text{budget deficit} \equiv G - T
\]
Adding Taxes to the Consumption Function

• To modify our aggregate consumption function to incorporate disposable income:

$$C = a + bY_d$$

Or:

$$C = a + b(Y - T)$$

• The consumption function now has consumption depending on disposable income instead of before-tax income.
Planned Investment

- The government can affect investment behavior through its tax treatment of depreciation and other tax policies.
- Planned investment depends on the interest rate.
The Determination of Equilibrium Output (Income) (1 of 2)

\[ Y = AE \]

and:

\[ AE \equiv C + I + G \]

So, equilibrium is:

\[ Y = C + I + G \]
TABLE 9.1   Finding Equilibrium for $I = 100$, $G = 100$, and $T = 100$

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>100</td>
<td>200</td>
<td>250</td>
<td>-50</td>
<td>100</td>
<td>100</td>
<td>450</td>
<td>-150</td>
<td>Output ↑</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>400</td>
<td>400</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>600</td>
<td>-100</td>
<td>Output ↑</td>
</tr>
<tr>
<td>700</td>
<td>100</td>
<td>600</td>
<td>550</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>750</td>
<td>-50</td>
<td>Output ↑</td>
</tr>
<tr>
<td>900</td>
<td>100</td>
<td>800</td>
<td>700</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>900</td>
<td>0</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>1,100</td>
<td>100</td>
<td>1,000</td>
<td>850</td>
<td>150</td>
<td>100</td>
<td>100</td>
<td>1,050</td>
<td>+50</td>
<td>Output ↑</td>
</tr>
<tr>
<td>1,300</td>
<td>100</td>
<td>1,200</td>
<td>1,000</td>
<td>200</td>
<td>100</td>
<td>100</td>
<td>1,200</td>
<td>+100</td>
<td>Output ↑</td>
</tr>
<tr>
<td>1,500</td>
<td>100</td>
<td>1,400</td>
<td>1,150</td>
<td>250</td>
<td>100</td>
<td>100</td>
<td>1,350</td>
<td>+150</td>
<td>Output ↑</td>
</tr>
</tbody>
</table>
Because \( G \) and \( I \) are both fixed at 100, the aggregate expenditure function is the new consumption function displaced upward by \( I + G = 200 \).

Equilibrium occurs at \( Y = C + I + G = 900 \).
The Saving/Investment Approach to Equilibrium

\[ S + T = I + G \]

In equilibrium, \[ Y = AE \]

\[ AE \equiv C + I + G \quad \text{and} \quad Y \equiv C + S + T \]

So, at equilibrium:

\[ C + S + T = C + I + G \]

\[ S + T = I + G \]
Fiscal Policy at Work: Multiplier Effects

• At this point, we are assuming that the government controls $G$ and $T$.

• We now review three multipliers:
  • Government spending multiplier
  • Tax multiplier
  • Balanced-budget multiplier
The Government Spending Multiplier

\[
\text{government spending Multiplier} \equiv \frac{1}{MPS} \equiv \frac{1}{1 - MPC}
\]

- **government spending multiplier** The ratio of the change in the equilibrium level of output to a change in government spending.
TABLE 9.2  Finding Equilibrium after a Government Spending Increase of 50*

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>100</td>
<td>200</td>
<td>250</td>
<td>-50</td>
<td>100</td>
<td>150</td>
<td>500</td>
<td>-200</td>
<td>Output ↑</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>400</td>
<td>400</td>
<td>0</td>
<td>100</td>
<td>150</td>
<td>650</td>
<td>-150</td>
<td>Output ↑</td>
</tr>
<tr>
<td>700</td>
<td>100</td>
<td>600</td>
<td>550</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>800</td>
<td>-100</td>
<td>Output ↑</td>
</tr>
<tr>
<td>900</td>
<td>100</td>
<td>800</td>
<td>700</td>
<td>100</td>
<td>100</td>
<td>150</td>
<td>950</td>
<td>-50</td>
<td>Output ↑</td>
</tr>
<tr>
<td>1,100</td>
<td>100</td>
<td>1,000</td>
<td>850</td>
<td>150</td>
<td>100</td>
<td>150</td>
<td>1,000</td>
<td>0</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>1,300</td>
<td>100</td>
<td>1,200</td>
<td>1,000</td>
<td>200</td>
<td>100</td>
<td>150</td>
<td>1,250</td>
<td>+50</td>
<td>Output ↓</td>
</tr>
</tbody>
</table>
FIGURE 9.3 The Government Spending Multiplier

- Increasing government spending by 50 shifts the \( AE \) function up by 50.
- As \( Y \) rises in response, additional consumption is generated.
- Overall, the equilibrium level of \( Y \) increases by 200, from 900 to 1,100.
The Tax Multiplier

• **tax multiplier** The ratio of change in the equilibrium level of output to a change in taxes.

\[ \Delta Y = (\text{initial increase in aggregate expenditure}) \times \left( \frac{1}{MPS} \right) \]

\[ \Delta Y = (-\Delta T \times MPC) \times \left( \frac{1}{MPS} \right) = -\Delta T \times \left( \frac{MPC}{MPS} \right) \]

\[ \text{tax multiplier} = -\left( \frac{MPC}{MPS} \right) \]
The Balanced-Budget Multiplier (1 of 2)

- **balanced-budget multiplier**  The ratio of change in the equilibrium level of output to a change in government spending where the change in government spending is balanced by a change in taxes so as not to create any deficit. The balanced-budget multiplier is equal to 1: The change in $Y$ resulting from the change in $G$ and the equal change in $T$ is exactly the same size as the initial change in $G$ or $T$.

  \[ \text{balanced-budget multiplier} \equiv 1 \]
TABLE 9.3 Finding Equilibrium after a Balanced-Budget Increase in G and T of 200 Each*

<table>
<thead>
<tr>
<th>(1) Output (Income) Y</th>
<th>(2) Net Taxes T</th>
<th>(3) Disposable Income Yd ≡ Y - T</th>
<th>(4) Consumption Spending C ≡ 100 + .75Yd</th>
<th>(5) Planned Investment Spending l</th>
<th>(6) Government Purchases G</th>
<th>(7) Planned Aggregate C+ l + G</th>
<th>(8) Unplanned Inventory Change Y – (C + l + G)</th>
<th>(9) Adjustment to Disequilibrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>300</td>
<td>200</td>
<td>250</td>
<td>100</td>
<td>300</td>
<td>650</td>
<td>−150</td>
<td>Output ↑</td>
</tr>
<tr>
<td>700</td>
<td>300</td>
<td>400</td>
<td>400</td>
<td>100</td>
<td>300</td>
<td>800</td>
<td>−100</td>
<td>Output ↑</td>
</tr>
<tr>
<td>900</td>
<td>300</td>
<td>600</td>
<td>550</td>
<td>100</td>
<td>300</td>
<td>950</td>
<td>−50</td>
<td>Output ↑</td>
</tr>
<tr>
<td>1,100</td>
<td>300</td>
<td>800</td>
<td>700</td>
<td>100</td>
<td>300</td>
<td>1,100</td>
<td>0</td>
<td>Equilibrium</td>
</tr>
<tr>
<td>1,300</td>
<td>300</td>
<td>1,100</td>
<td>850</td>
<td>100</td>
<td>300</td>
<td>1,250</td>
<td>+50</td>
<td>Output ↓</td>
</tr>
<tr>
<td>1,500</td>
<td>300</td>
<td>1,200</td>
<td>1,100</td>
<td>100</td>
<td>300</td>
<td>1,400</td>
<td>+100</td>
<td>Output ↓</td>
</tr>
</tbody>
</table>

* Both G and T have increased from 100 in Table 9.1 to 300 here.
### TABLE 9.4 Summary of Fiscal Policy Multipliers

<table>
<thead>
<tr>
<th>Policy Stimulus</th>
<th>Multiplier</th>
<th>Final Impact on Equilibrium Y</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government spending multiplier</strong></td>
<td>Increase or decrease in the level of government purchases: $\Delta G$</td>
<td>$\frac{1}{MPS}$</td>
</tr>
<tr>
<td><strong>Tax multiplier</strong></td>
<td>Increase or decrease in the level of net taxes: $\Delta T$</td>
<td>$-\frac{MPC}{MPS}$</td>
</tr>
<tr>
<td><strong>Balanced-budget multiplier</strong></td>
<td>Simultaneous balanced-budget increase or decrease in the levels of government purchases and net taxes: $\Delta G = \Delta T$</td>
<td>1</td>
</tr>
</tbody>
</table>
The Balanced-Budget Multiplier (2 of 2)

A Warning

• Although we have added government, the story told about the multiplier is still incomplete and oversimplified.

• We have been treating net taxes \((T)\) as a lump-sum, fixed amount, whereas in practice, taxes depend on income.

• Appendix B to this chapter shows that the size of the multiplier is reduced when we make the more realistic assumption that taxes depend on income.
The Federal Budget

- Fiscal policy is the manipulation of items in the federal budget, so the federal budget is relevant to our study of macroeconomics.

- **federal budget**  The budget of the federal government.

- The federal budget is the product of a complex interplay of social, political, and economic forces.
The Budget in 2014

• **federal surplus (+) or deficit (−)** Federal government receipts minus expenditures.

• In 2014, the federal government had total receipts of $3,300.8 billion.

• The federal government spent $3883.1 billion in expenditures in 2014.
# TABLE 9.5 Federal Government Receipts and Expenditures, 2014

<table>
<thead>
<tr>
<th>Source of Revenue</th>
<th>Amount (Billions, $)</th>
<th>Percentage of total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current receipts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>1,374.2</td>
<td>41.6</td>
</tr>
<tr>
<td>Excise taxes and customs duties</td>
<td>134.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Corporate income taxes</td>
<td>497.3</td>
<td>15.1</td>
</tr>
<tr>
<td>Taxes from the rest of the world</td>
<td>18.9</td>
<td>0.6</td>
</tr>
<tr>
<td>Contributions for social insurance</td>
<td>1,149.4</td>
<td>34.8</td>
</tr>
<tr>
<td>Interest receipts and rent and royalties</td>
<td>78.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Current transfer receipts from business and persons</td>
<td>68.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Current surplus of government enterprises</td>
<td>-19.7</td>
<td>-0.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,300.8</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Current expenditures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption expenditures</td>
<td>965.2</td>
<td>24.9</td>
</tr>
<tr>
<td>Transfer payments to persons</td>
<td>1,863.4</td>
<td>48.0</td>
</tr>
<tr>
<td>Transfer payments to the rest of the world</td>
<td>55.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Grants-in-aid to state and local governments</td>
<td>500.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Interest payments</td>
<td>441.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Subsidies</td>
<td>56.9</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,883.1</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Net federal government saving-surplus (+) or deficit (-)</strong></td>
<td>(total current receipts – total current expenditures)</td>
<td>-582.3</td>
</tr>
</tbody>
</table>

MyEconLab Real-time data
Fiscal Policy since 1993: The Clinton, Bush, and Obama Administrations

FIGURE 9.4 Federal Personal Income Taxes as a Percentage of Taxable Income, 1993 I–2014 IV
FIGURE 9.5 Federal Government Consumption Expenditures as a Percentage of GDP and Federal Transfer Payments and Grants-in-Aid as a Percentage of GDP, 1993 I–2014 IV
FIGURE 9.6 The Federal Government Surplus (+) or Deficit (−) as a Percentage of GDP, 1993 I–2014 IV
ECONOMICS IN PRACTICE
Long-Term Projections of the Federal Government Budget

• In 2014, the Congressional Budget Office (CBO) estimated that the federal debt was 74% of GDP but would decrease in the next few years as the economy continued to recover.

• In the long term, however, the CBO estimated that the debt would increase substantially, to more than 100% of GDP by 2039, largely because of the costs associated with the aging of the U.S. population.

THINKING PRACTICALLY

1. Why does the aging of the population increase the debt?
The Federal Government Debt

- **federal debt** The total amount owed by the federal government.

- **privately held federal debt** The privately held (non-government-owned) debt of the U.S. government.
The Economy’s Influence on the Government Budget (1 of 2)

Automatic Stabilizers and Destabilizers

- **automatic stabilizers** Revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to stabilize GDP.

- **automatic destabilizers** Revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to destabilize GDP.

- **fiscal drag** The negative effect on the economy that occurs when average tax rates increase because taxpayers have moved into higher income brackets during an expansion.
Full-Employment Budget

- **full-employment budget** What the federal budget would be if the economy were producing at the full-employment level of output.

- **structural deficit** The deficit that remains at full employment.

- **cyclical deficit** The deficit that occurs because of a downturn in the business cycle.
REVIEW TERMS AND CONCEPTS (1 of 2)

- automatic destabilizers
- automatic stabilizers
- balanced-budget multiplier
- budget deficit
- cyclical deficit
- discretionary fiscal policy
- disposable, or after-tax, income ($Y_d$)
- federal budget
- federal debt
- federal surplus (+) or deficit (−)
- fiscal drag
- fiscal policy
- full-employment budget
- government spending multiplier
- monetary policy
- net taxes ($T$)
- privately held federal debt
- structural deficit
- tax multiplier
Equations:

- disposable income: \( Y_d \equiv Y - T \)
- \( AE \equiv C + I + G \)
- government budget deficit: \( G - T \)
- equilibrium in an economy with a government: \( Y \equiv C + I + G \)
- saving/investment approach to equilibrium in an economy with a government: \( S + T = I + G \)
- government spending Multiplier \( \equiv \frac{1}{MPS} \equiv \frac{1}{1 - MPC} \)

- tax multiplier: \( -\left(\frac{MPC}{MPS}\right) \)
- balanced-budget multiplier: \( \equiv 1 \)
The Government Spending and Tax Multiplier

Using our hypothetical consumption function:  \[ C = a + b(Y - T) \]

The equilibrium condition is:  \[ Y = C + I + G \]

By substituting for \( C \), we get:  \[ Y = a + b(Y - T) + I + G \]

\[ Y = a + bY - bT + I + G \]

Rearranging terms to yield:  \[ Y - bY = a + I + G - bT \]

\[ Y(1 - b) = a + I + G - bT \]

\[ Y = \frac{1}{(1 - b)}(a + I + G - bT) \]
initial increase in spending is $\Delta G$

initial decrease in spending or $\Delta C = \Delta T(MPC)$

net initial increase in spending

$= \text{initial increase in spending} - \text{initial decrease in spending}$

$= \Delta G - \Delta T(MPC)$

In a balanced-budget increase, $\Delta G = \Delta T$, so in the above equation for the net initial increase in spending, we can substitute $\Delta G$ for $\Delta T$:

$$\Delta G - \Delta G(MPC) = \Delta G(1 - MPC)$$
Because MPS = (1 − MPC), the net initial increase in spending is:

\[ \Delta G(MPS) \]

We can now apply the expenditure multiplier \( \left( \frac{1}{MPS} \right) \) to this net initial increase in spending:

\[ \Delta Y = \Delta G(MPS) \left( \frac{1}{MPS} \right) = \Delta G \]

Thus, the final total increase in the equilibrium level of \( Y \) is just equal to the initial balanced increase in \( G \) and \( T \).
FIGURE 9B.1 The Tax Function

This graph shows net taxes (taxes minus transfer payments) as a function of aggregate income.

\[ Y_d \equiv Y - T \]
\[ Y_d \equiv Y - (-200 + \frac{1}{3}Y) \]
\[ Y_d \equiv Y + 200 - \frac{1}{3}Y \]
\[ C \equiv 100 + 0.75Y_d \]
\[ C \equiv 100 + 0.75(Y + 200 - \frac{1}{3}Y) \]
\[ Y_d \equiv Y + 200 - \frac{1}{3}Y \]
The Government Spending and Tax Multipliers Algebraically  

\[ C = a + b(Y - T) \]
\[ C = a + b(Y - T_0 - tY) \]
\[ C = a + bY - bT_0 - btY \]

We know that \( Y = C + I + G \) Through substitution we get:

\[ Y = a + bY - bT_0 - btY + I + G \]

Solving for \( Y \):

\[ Y = \frac{1}{(1 - b + bt)}(a + I + G - bT_0) \]
This means that a $1 increase in G or I (holding a and T0 constant) will increase the equilibrium level of Y by:

\[
\frac{1}{(1 - b + bt)}
\]

Holding a, I, and G constant, a fixed or lump-sum tax cut (a cut in T0) will increase the equilibrium level of income by:

\[
\frac{b}{1 - b + bt}
\]
When taxes are strictly lump sum \( T = 100 \) and do not depend on income, the aggregate expenditure function is steeper than when taxes depend on income.

\[
Y = C + I + G \\
Y = 100 + 0.75(Y + 200 - \frac{1}{3}Y) + \frac{100 + 100}{C} \\
Y = 100 + 0.75 + 150 - 25Y + 100 + 100 \\
Y = 450 + 0.5Y \\
0.5Y = 450
\]