Monetary Theory and Policy

Chapter 20：The *IS Curve*

Planned Expenditure and Aggregate Demand

- **Planned expenditure** is the total amount of spending on domestically produced goods and services that households, businesses, the government, and foreigners want to make.
- **Aggregate demand** is the total amount of output demanded in the economy.

Planned Expenditure and Aggregate Demand

- The total quantity demanded of an economy's output is the sum of 4 types of spending:
  - **-Consumption expenditure** (C)
    -**Planned investment spending** (*I*)
  - -**Government purchases** (*G*)
  - -**Net exports** (*NX*)

The Components of Aggregate Demand

- Consumption expenditure and the consumption function:

Income is the most important factor determining consumption spending

Disposable income (Y_D) is total income less taxes $(Y - T)$

The marginal propensity to consume (mpc) is the slope of the consumption function $(\Delta C / \Delta Y_D)$, the change in consumer expenditure that results from an additional dollar of disposable income

a is automonous consumer expenditure, the amount of consumer expenditure that is independent of disposable income (how much will be spent when disposable income is 0)

$$C = a + mpc(Y_D)$$

Planned Investment Spending

- **Fixed investment** are always planned.
- **Inventory investment** can be unplanned.
- **Planned investment spending**
  - Interest rates
  - Expectations

Net Exports

- Made up of two components: autonomous net exports and the part of net exports that is affected by changes in real interest rates
- Net export function:

$$NX = \overline{N}\,\overline{X} - xr$$

Government Purchases and Taxes

- The government affects aggregate demand in two ways: through its purchases and taxes
- Government purchases:

$$G = \overline{G}$$

- Government taxes:

$$T = \overline{T}$$

Goods Market Equilibrium

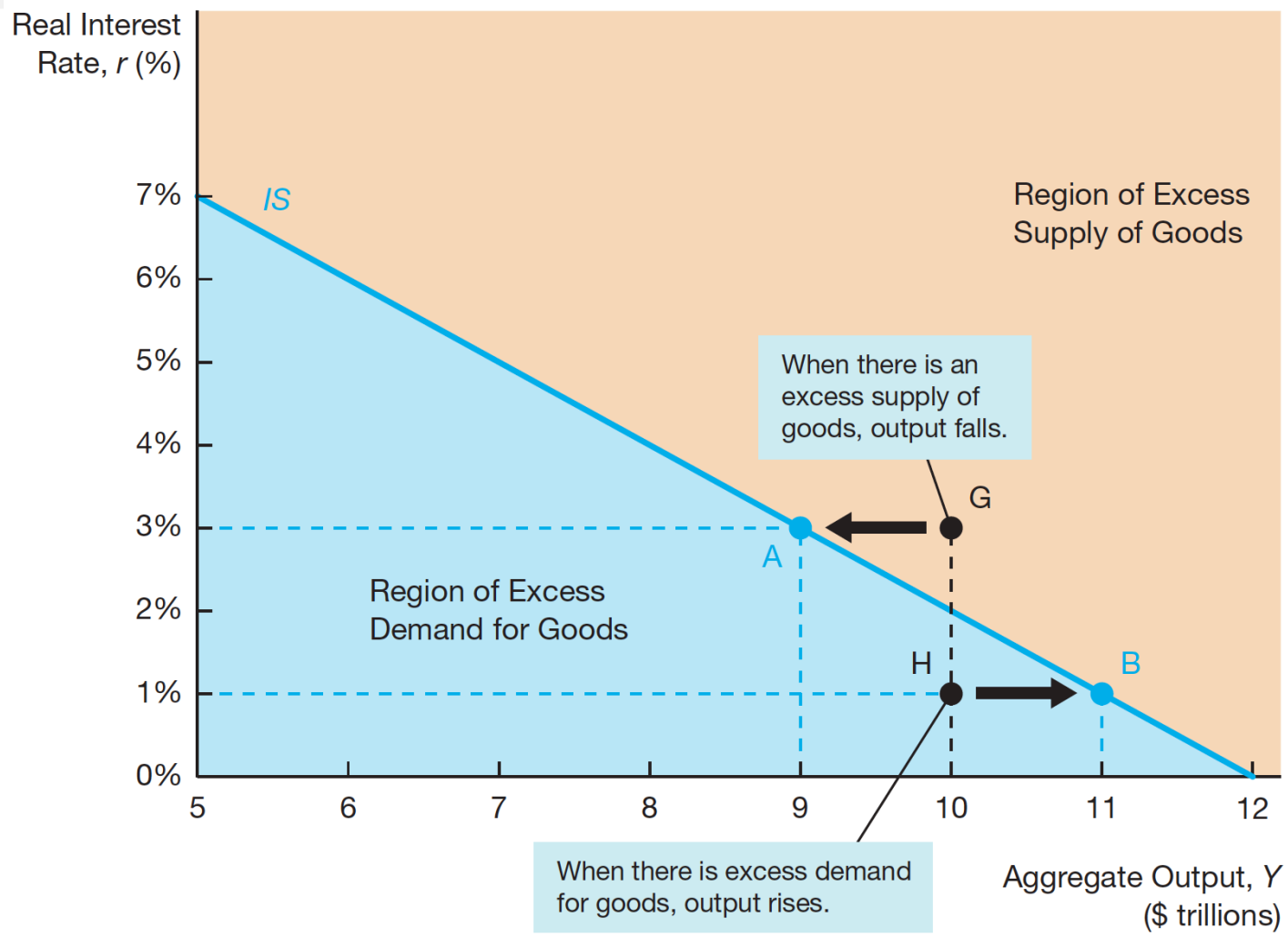
- Keynes recognized that equilibrium would occur in the economy when the total quantity of output produced in the economy equals the total amount of aggregate demand (planned expenditure).
- Solving for goods market equilibrium:

  Aggregate Output = Consumption Expenditure + Planned Investment Spending + Government Purchases + Net Exports

Understanding the *IS* Curve

- What the *IS* curve tells us: traces out the points at which the goods market is in equilibrium
- Examines an equilibrium where aggregate output equals aggregate demand
- Assumes fixed price level where nominal and real quantities are the same
- *IS* curve is the relationship between equilibrium aggregate output and the interest rate.

Figure 1 The *IS* Curve



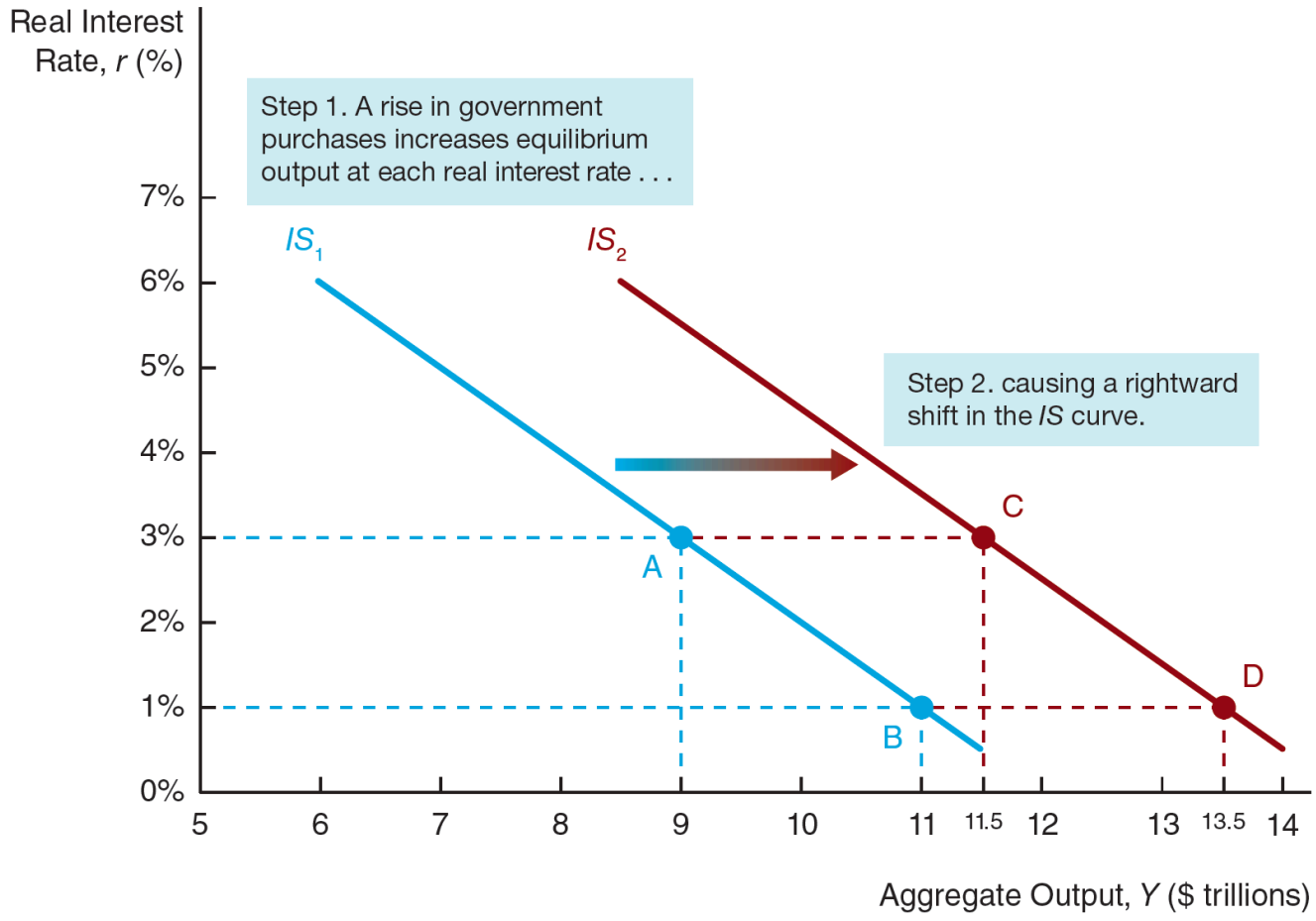
Why the Economy Heads Toward the Equilibrium

- Interest rates and planned investment spending
  - Negative relationship
- Interest rates and net exports
  - Negative relationship
- *IS* curve: the points at which the total quantity of goods produced equals the total quantity of goods demanded
- Output tends to move toward points on the curve that satisfies the goods market equilibrium.

Factors that Shift the *IS* Curve

- The *IS* curve shifts whenever there is a change in autonomous factors (factors independent of aggregate output and the real interest rate).
- One example is changes in government purchases, as in Figure 2.

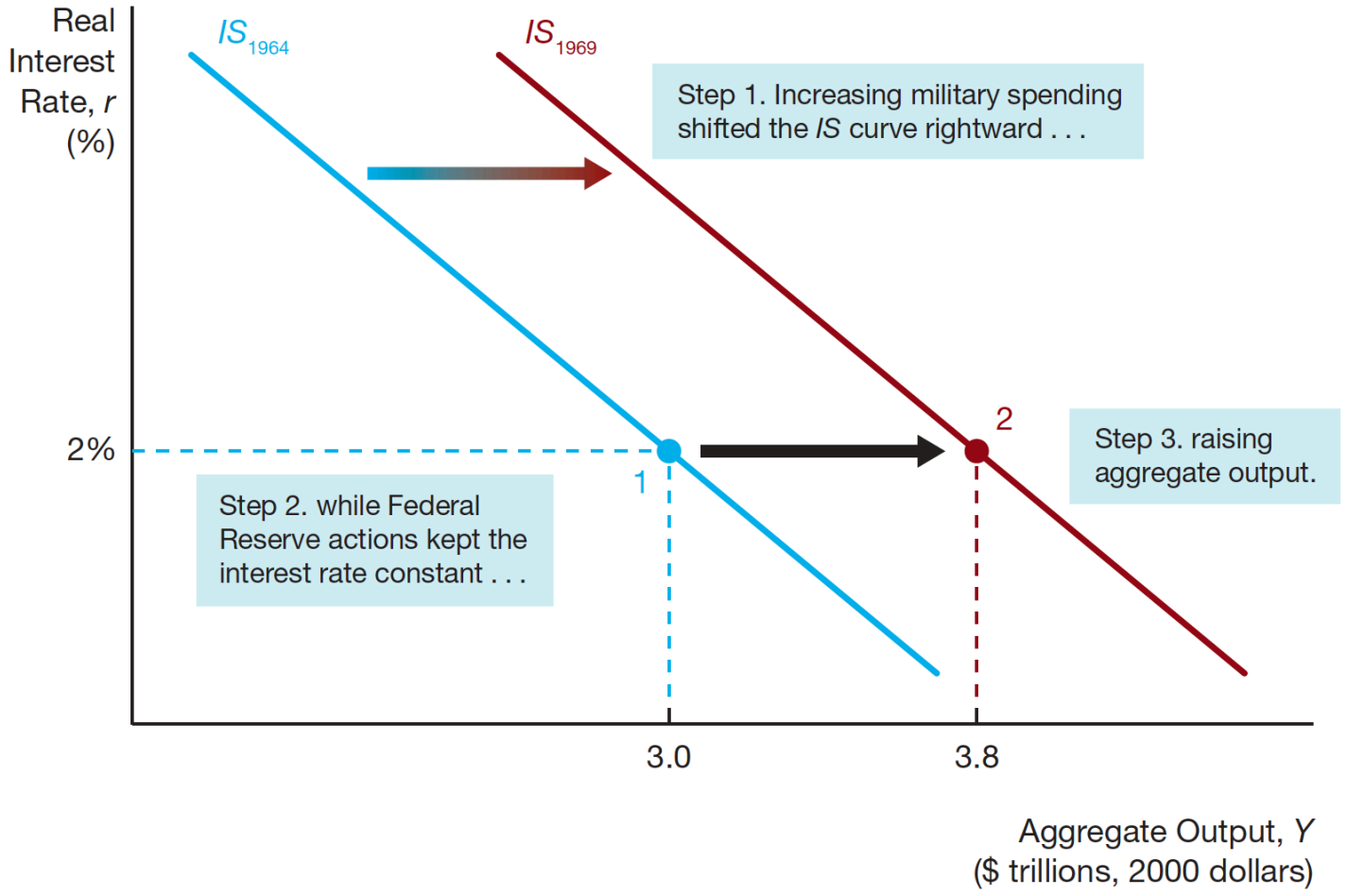
Figure 2 Shift in the *IS* Curve from an Increase in Government Purchases



Application: The Vietnam War Buildup, 1964–1969

- The United States' involvement in Vietnam began to escalate in the early 1960s.
- Usually during a period when government purchases are rising rapidly, central banks raise real interest rates to keep the economy from overheating.
- The Vietnam War period, however, is unusual because the Federal Reserve decided to keep real interest rates constant. Hence, this period provides an excellent example of how policymakers could make use of the *IS* curve analysis to inform policy.

Figure 3 Vietnam War Build Up

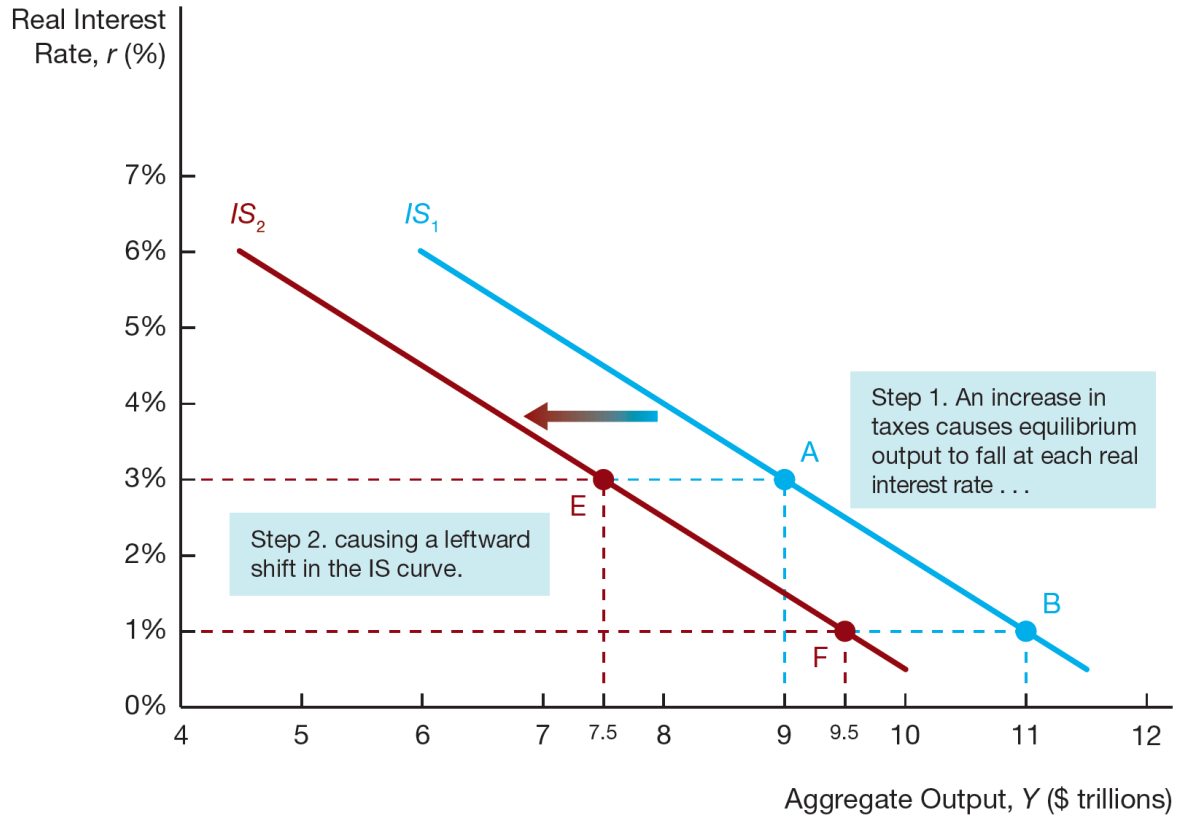


Changes in Taxes

- At any given real interest rate, a rise in taxes causes aggregate demand and hence equilibrium output to fall, thereby shifting the *IS* curve *to the left*.
- Conversely, a cut in taxes at any given real interest rate increases disposable income and causes aggregate demand and equilibrium output to rise, shifting the *IS* curve *to the right*.

Figure 4 Shift in the *IS* Curve from an Increase in Taxes

- Another example of what shifts the *IS* curve is changes in taxes, as in Figure 4



Application: The Fiscal Stimulus Package of 2009

- In the fall of 2008, the U.S. economy was in crisis. By the time the new Obama administration had taken office, the unemployment rate had risen from 4.7% just before the recession began in December 2007 to 7.6% in January 2009.
- To stimulate the economy, the Obama administration proposed a fiscal stimulus package that, when passed by Congress, included $288 billion in tax cuts for households and businesses and $499 billion in increased federal spending, including transfer payments.

Application: The Fiscal Stimulus Package of 2009

- These tax cuts and spending increases were predicted to increase aggregate demand, thereby raising the equilibrium level of aggregate output at any given real interest rate and so shifting the *IS* curve to the right.
- Unfortunately, most of the government purchases did not kick in until after 2010, while the decline in autonomous consumption and investment were much larger than anticipated.
- The fiscal stimulus was more than offset by weak consumption and investment, with the result that the aggregate demand ended up contracting rather than rising, and the *IS* curve did not shift to the right, as hoped.

Factors that Shift the *IS* Curve

- Changes in autonomous spending also affect the *IS* curve:
  - **Autonomous consumption**
  - **Autonomous investment spending**
  - **Autonomous net exports**

Autonomous Consumption

- A rise in autonomous consumption would raise aggregate demand and equilibrium output at any given interest rate, shifting the *IS* curve to the right.
- Conversely, a decline in autonomous consumption expenditure causes aggregate demand and equilibrium output to fall, shifting the *IS* curve to the left.

Autonomous Investment Spending

- An increase in autonomous investment spending increases equilibrium output at any given interest rate, shifting the *IS* curve to the right.
- On the other hand, a decrease in autonomous investment spending causes aggregate demand and equilibrium output to fall, shifting the *IS* curve to the left.

Autonomous Net Exports

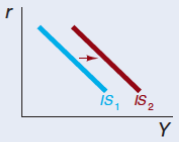
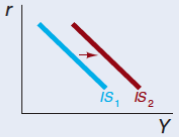
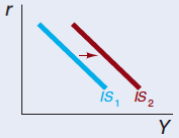
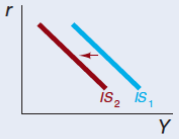
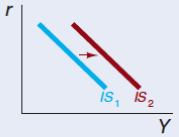
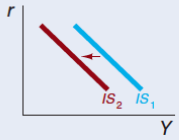
- An autonomous increase in net exports leads to an increase in equilibrium output at any given interest rate and shifts the *IS* curve to the right.
- Conversely, an autonomous fall in net exports causes aggregate demand and equilibrium output to decline, shifting the *IS* curve to the left.

Factors that Shift the *IS* Curve

- Another factor that shifts the *IS* curve is changes in financial frictions
  - An increase in financial frictions, as occurred during the financial crisis of 2007-2009, raises the real cost of borrowing to firms and hence causes investment spending and aggregate demand to fall

SUMMARY TABLE 1

Shifts in the *IS* Curve from Autonomous Changes in $\overline{C}$, $\overline{I}$, $\overline{G}$, $\overline{T}$, $\overline{NX}$, and $\overline{f}$

Variable	Change in Variable	Shift in *IS* Curve	Reason
Autonomous consumption expenditure, $\overline{C}$	↑		$C\uparrow\ Y\uparrow$
Autonomous investment, $\overline{I}$	↑		$I\uparrow\ Y\uparrow$
Government spending, $\overline{G}$	↑		$G\uparrow\ Y\uparrow$
Taxes, $\overline{T}$	↑		$T\uparrow \Rightarrow C\downarrow\ Y\downarrow$
Autonomous net exports, $\overline{NX}$	↑		$\overline{NX}\uparrow\ Y\uparrow$
Financial frictions, $\overline{f}$	↑		$I\downarrow\ Y\downarrow$

Note: Only increases (↑) in the variables are shown; the effects of decreases in the variables on aggregate output would be the opposite of those indicated in the last two columns.