11. Monetary and Fiscal Policy

Based on Mankiw, Chapter 14: *Aggregate Demand II: Applying the IS—LM model*

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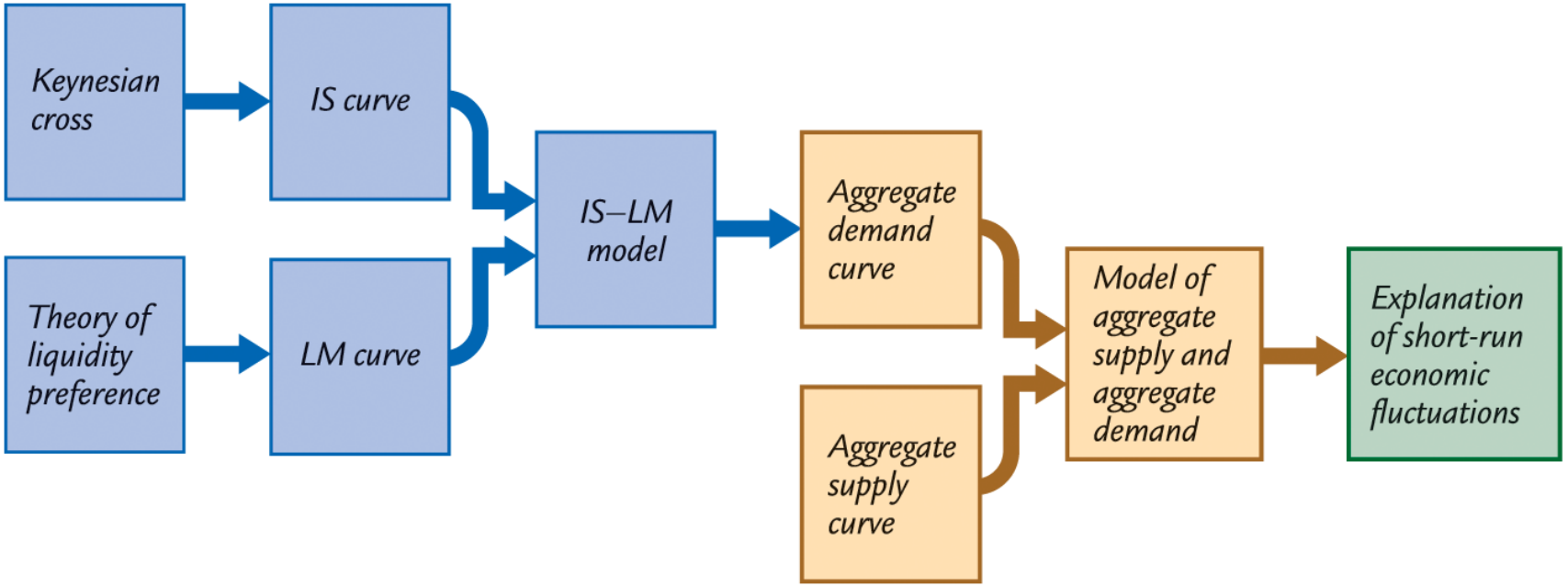
The big picture



Equilibrium in the *IS–LM* model

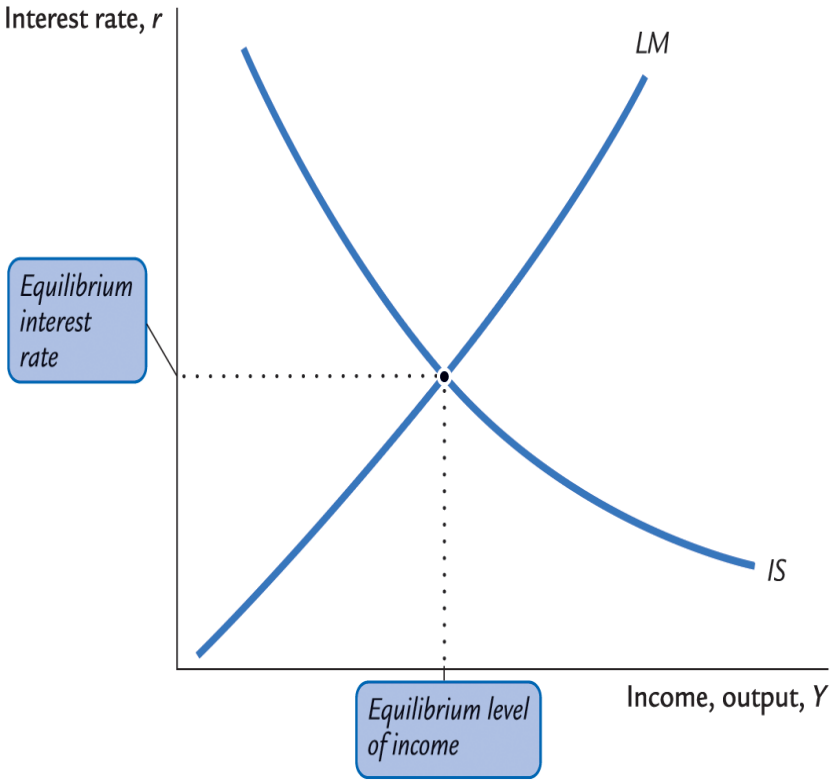
The *IS* curve represents equilibrium in the goods market.

$$Y = C(Y - \bar{T}) + I(r) + \bar{G}$$

The *LM* curve represents money market equilibrium.

$$\bar{M}/\bar{P} = L(r, Y)$$

The intersection determines the unique combination of Y and r that satisfies equilibrium in both markets.



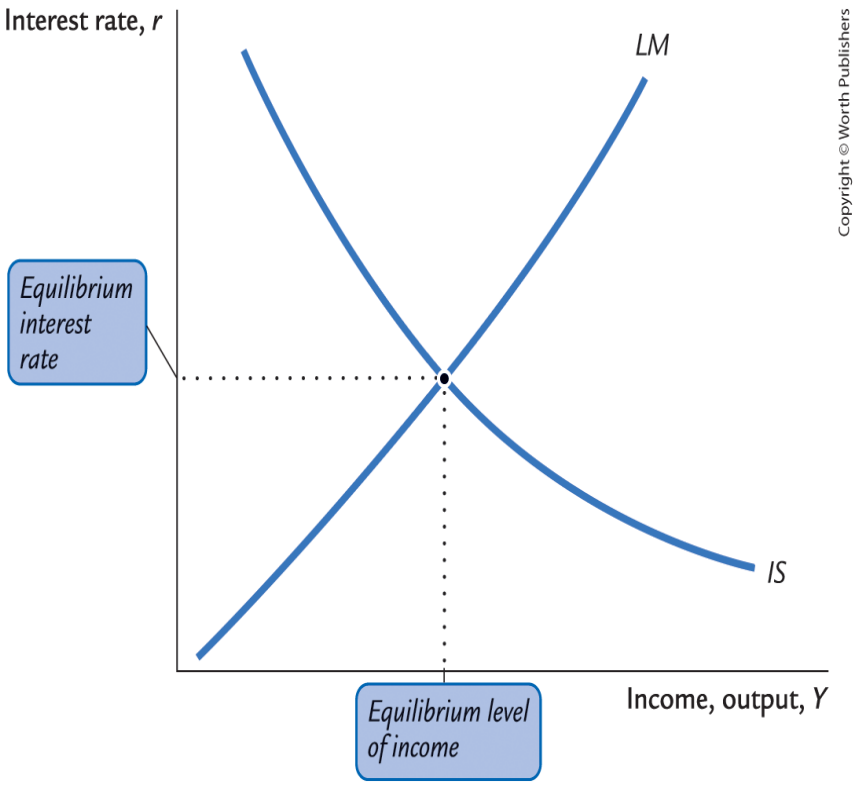
Policy analysis with the *IS–LM* model

$$Y = C(Y - \bar{T}) + I(r) + \bar{G}$$

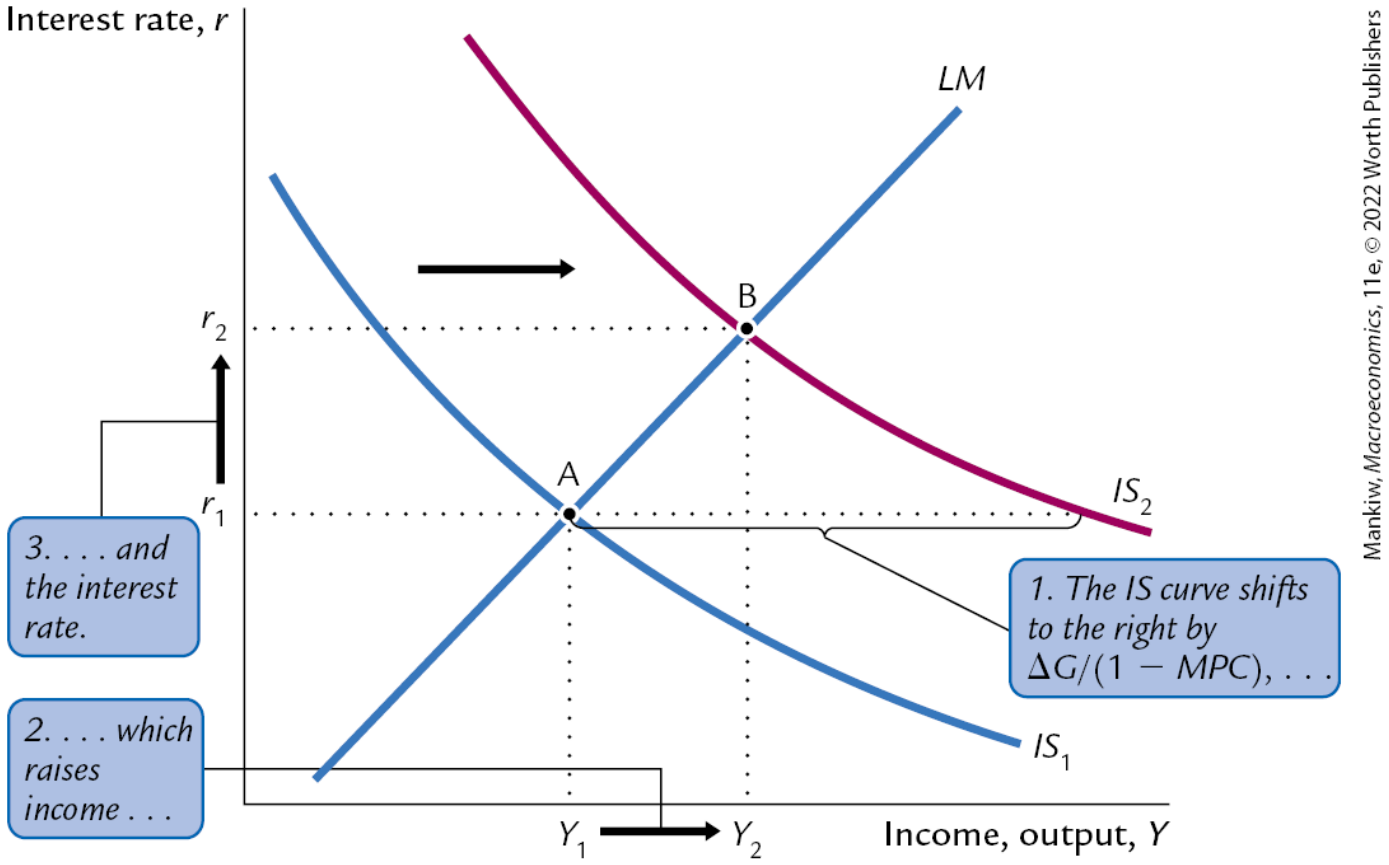
$$\bar{M}/\bar{P} = L(r, Y)$$

We can use the *IS–LM* model to analyze the effects of

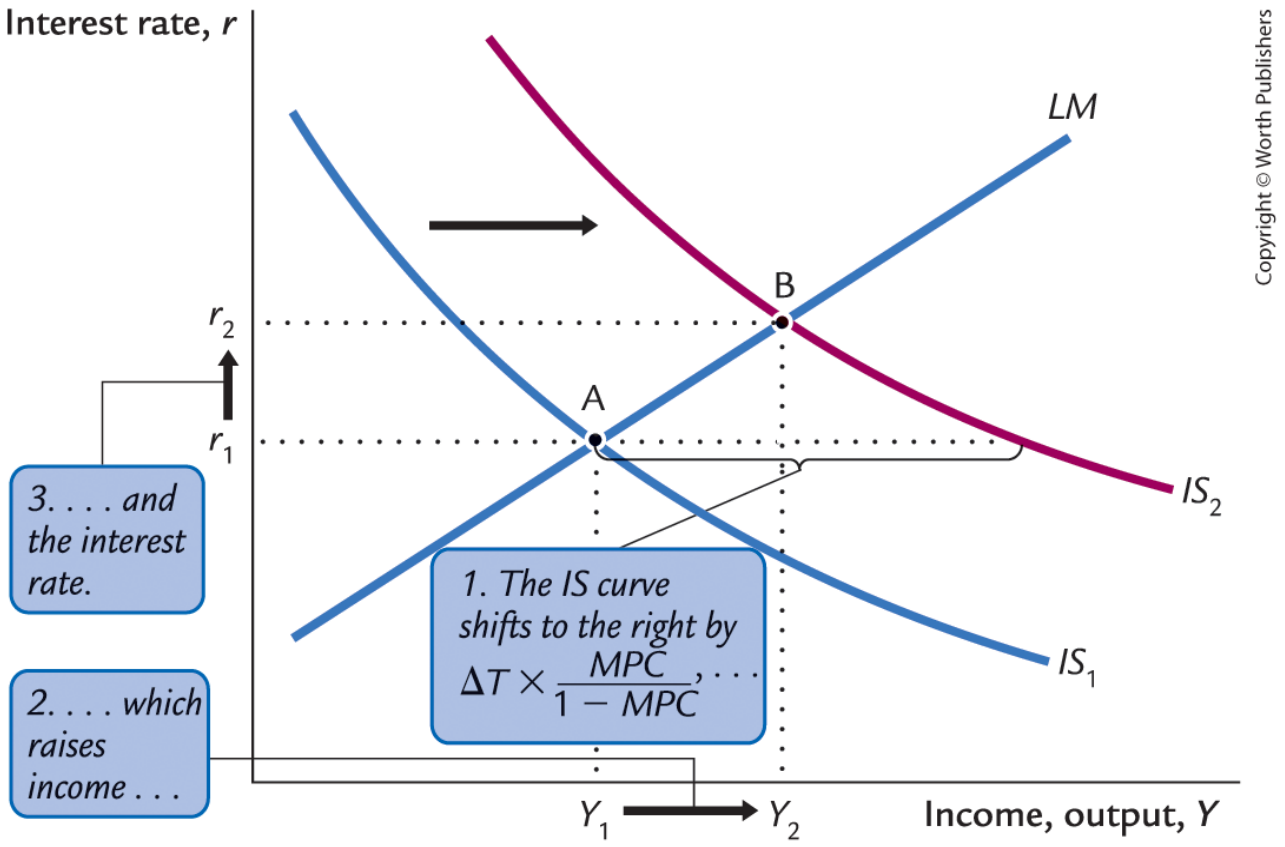
- fiscal policy: ***G*** and/or ***T***
- monetary policy: ***M***



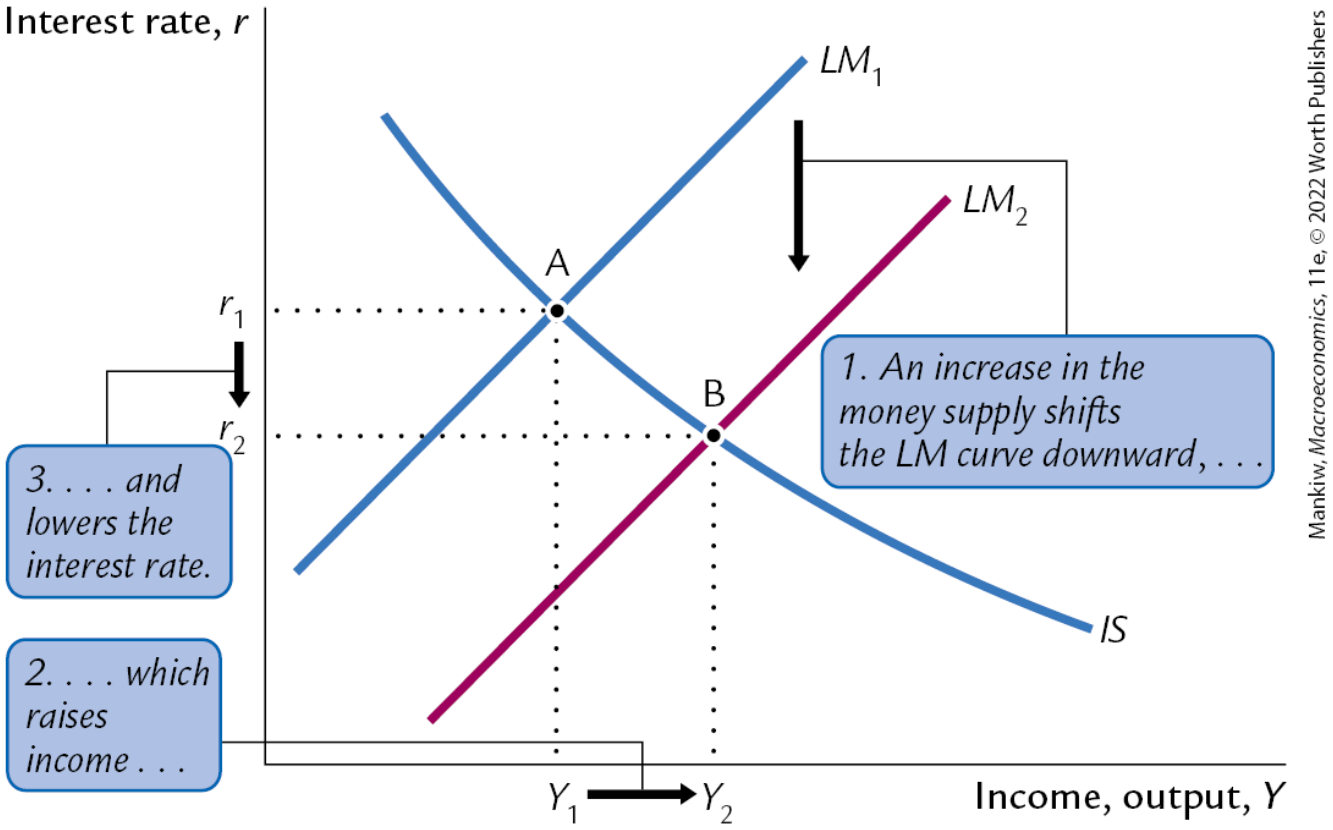
Fiscal policy 1: An increase in government purchases



Fiscal policy 2: A tax cut



Monetary policy: An increase in money supply



Interaction between monetary and fiscal policy

- Model:
  - Monetary and fiscal policy variables (***M***, ***G***, and ***T***) are exogenous.
- Real world:
  - Monetary policymakers may adjust ***M*** in response to changes in fiscal policy or vice versa.
  - Such interactions may alter the impact of the original policy change.

The Fed's response to $\Delta G < 0$

- Suppose Congress decreases government spending.
- Possible Fed responses:
  1. Hold money supply constant
  2. Change money supply to hold ***r*** constant
  3. Change money supply to hold ***Y*** constant
- In each case, the effects of $\Delta \boldsymbol{G}$ are different . . .

- Graphs on board

The Fed's response to $\Delta G > 0$

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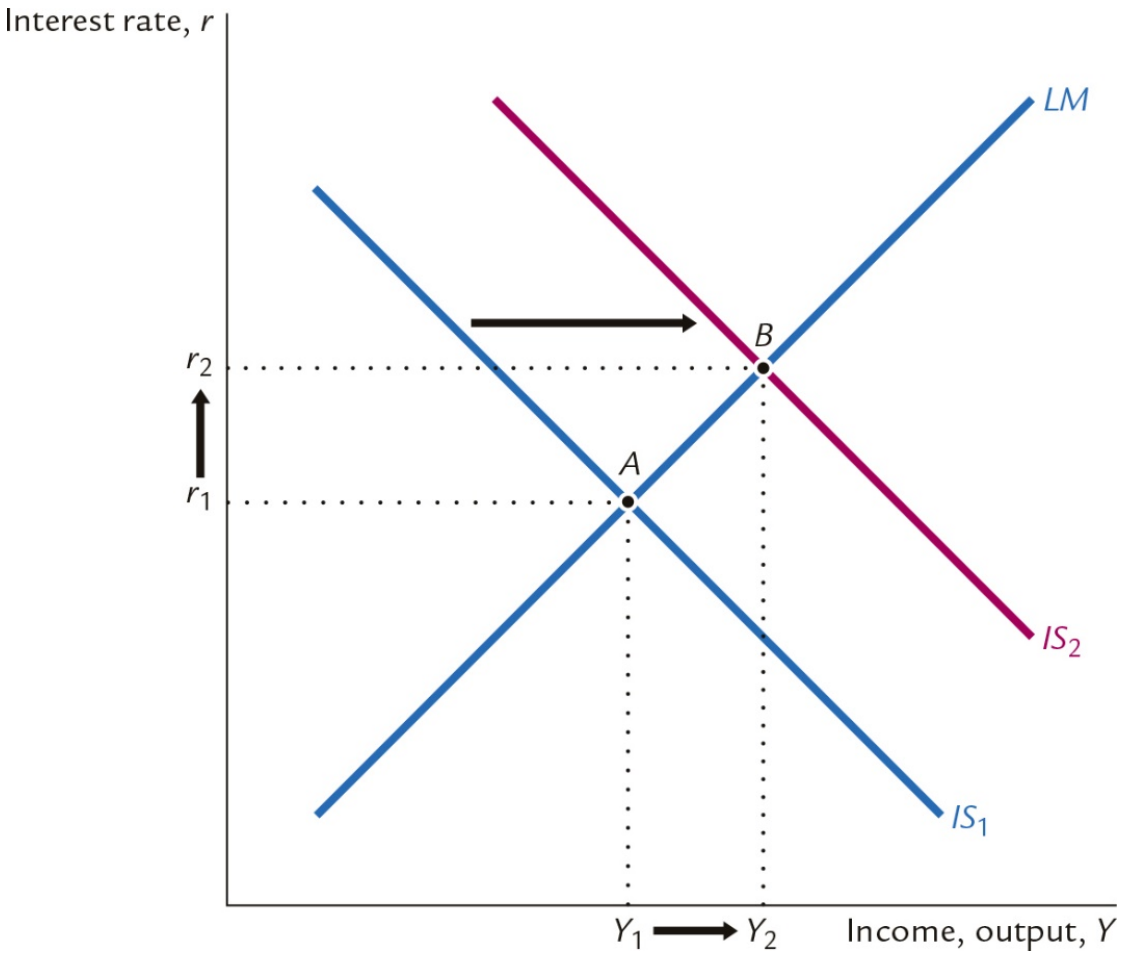
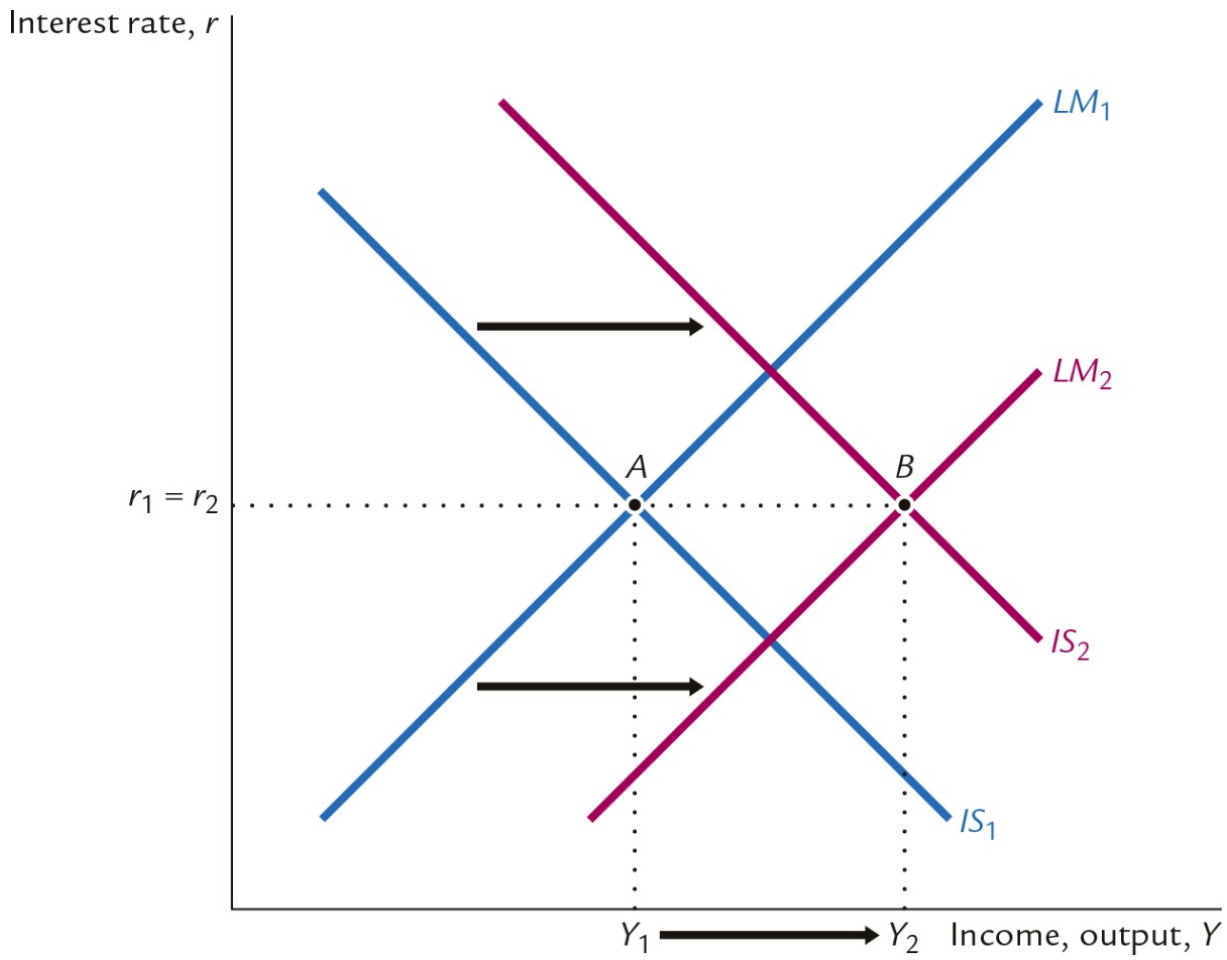
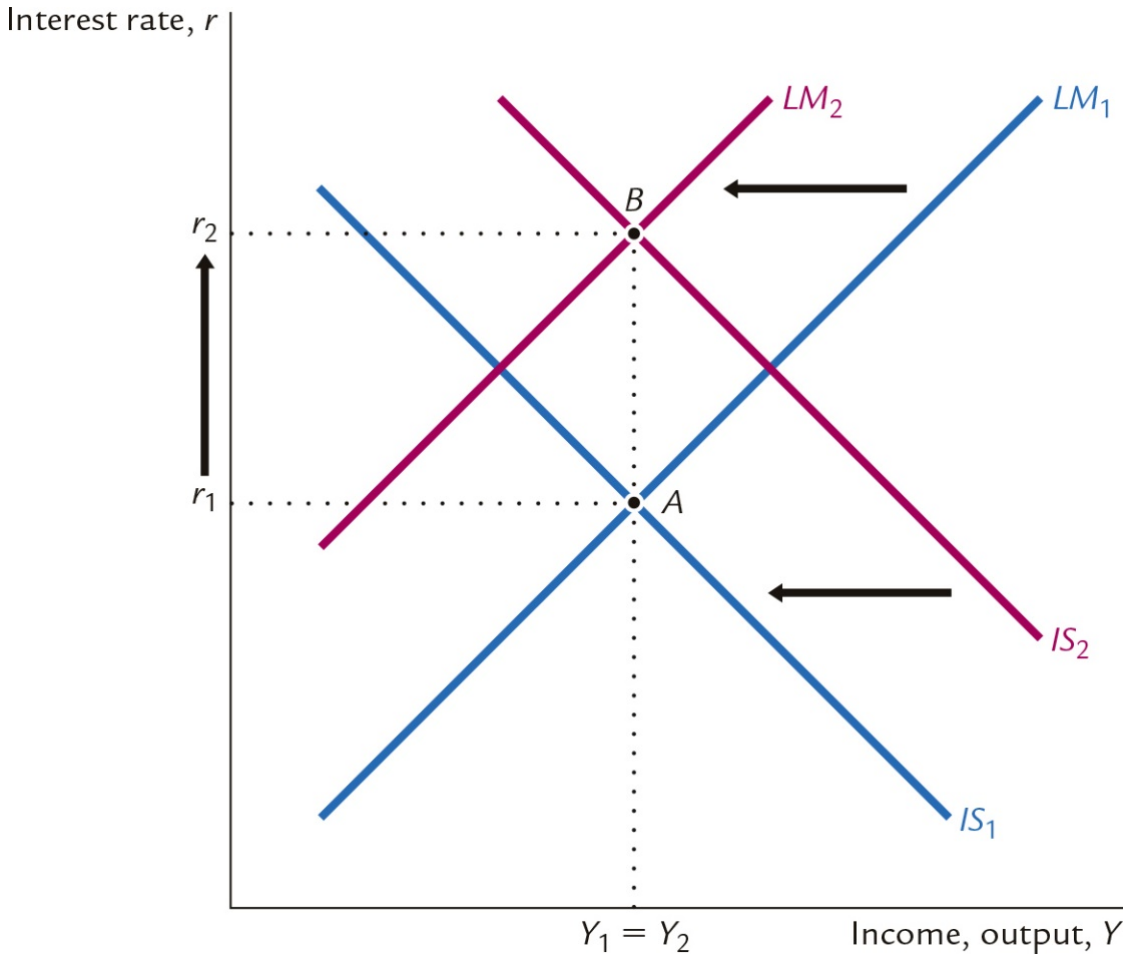
Response 1: Hold *M* constant



Response 2: Hold *r* constant



Response 3: Hold *Y* constant



Shocks in the *IS–LM* model, part 1

***IS* shocks**: exogenous changes in the demand for goods and services

For example:

- stock market boom or crash
  → change in households' wealth
  → Δ***C***
- change in business or consumer confidence or expectations
  → Δ***I*** and/or Δ***C***

Shocks in the *IS–LM* model, part 2

***LM* shocks**: exogenous changes in the demand for money

For example:

- During Covid-19, consumers and companies did not wish to handle cash and switched to more cashless methods of payments.
- More ATMs or the internet reduce money demand.

NOW YOU TRY

Analyze shocks with the *IS–LM* model

Use the *IS–LM* model to analyze the effects of

1. a housing market crash that reduces consumers' wealth.
2. consumers using cash in transactions more frequently in response to an increase in identity theft.

For each shock,

a. use the *IS–LM* diagram to determine the effects on ***Y*** and ***r*.**
b. figure out what happens to ***C***, ***I***, and the unemployment rate.

NOW YOU TRY

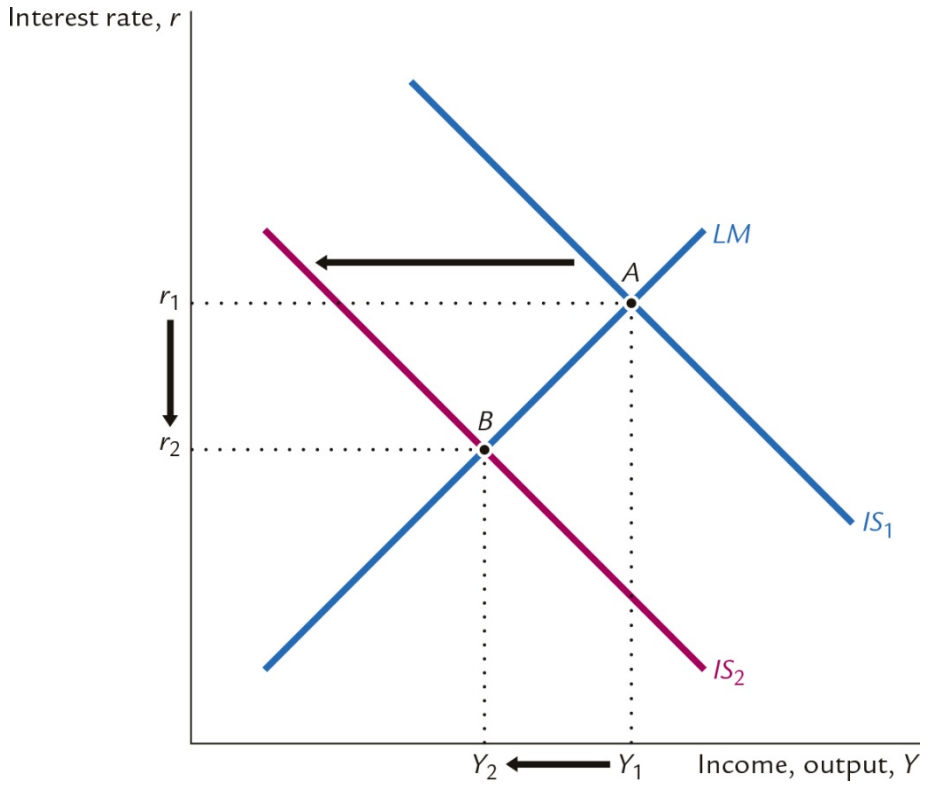
Analyze shocks with the *IS–LM* model, answer, part 1

IS shifts left, causing ***r*** and ***Y*** to fall.

C falls due to lower wealth and lower income.

I rises because ***r*** is lower.

u rises because ***Y*** is lower.
(Okun's law)



NOW YOU TRY

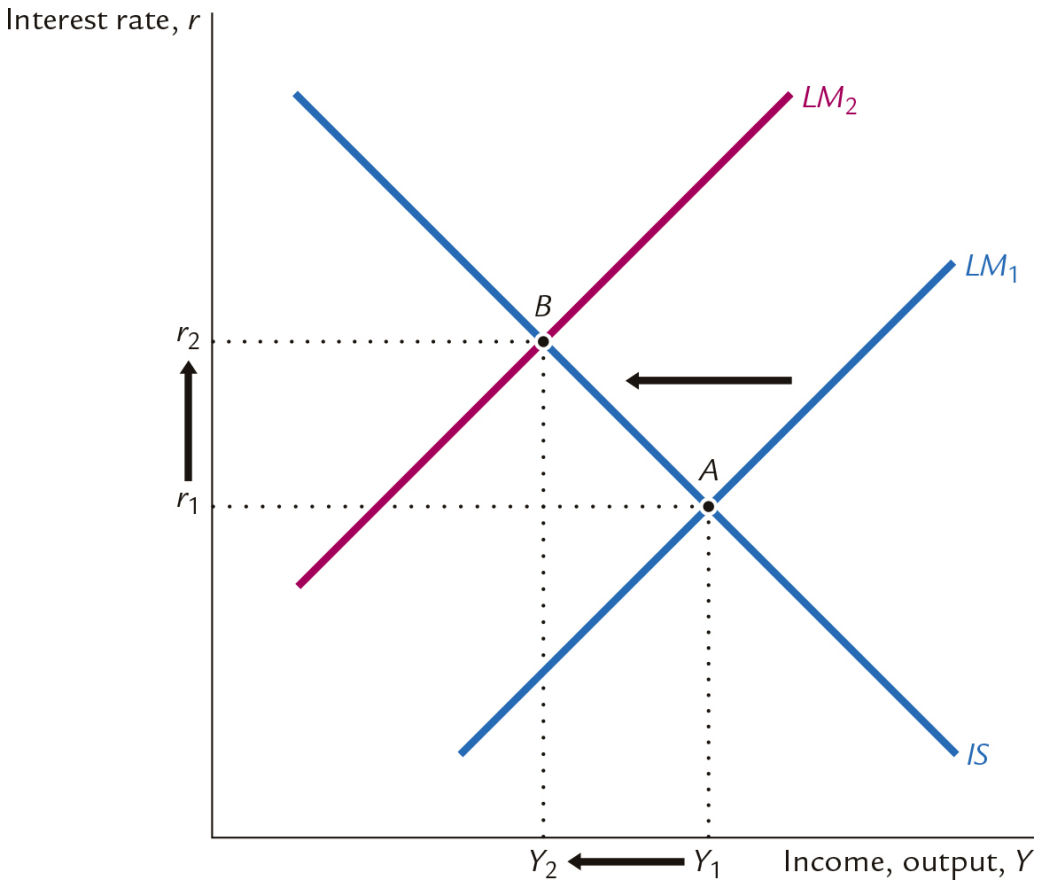
Analyze shocks with the *IS–LM* model, answer, part 2

LM shifts left, causing ***r*** to rise and ***Y*** to fall.

C falls due to lower income.

I falls because ***r*** is higher.

u rises because ***Y*** is lower. (Okun's law)



CASE STUDY: The U.S. recession of 2001, part 1

- During 2001:
  - 2.1 million jobs lost, unemployment rose from 3.9 percent to 5.8 percent.
  - GDP growth slowed to 0.8 percent (compared to 3.9 percent average annual growth during 1994–2000).

CASE STUDY: The U.S. recession of 2001, part 2

Causes: 1) Stock market decline → ↓***C***

- S&P 500 fell from 1,500 in August 2000 to 1,150 in December 2001.

Causes: 2) 9/11

- increased uncertainty
- fall in consumer and business confidence
- result: lower spending, *IS* curve shifted left

Causes: 3) Corporate accounting scandals

- Enron, WorldCom, etc.
- reduced stock prices, discouraged investment

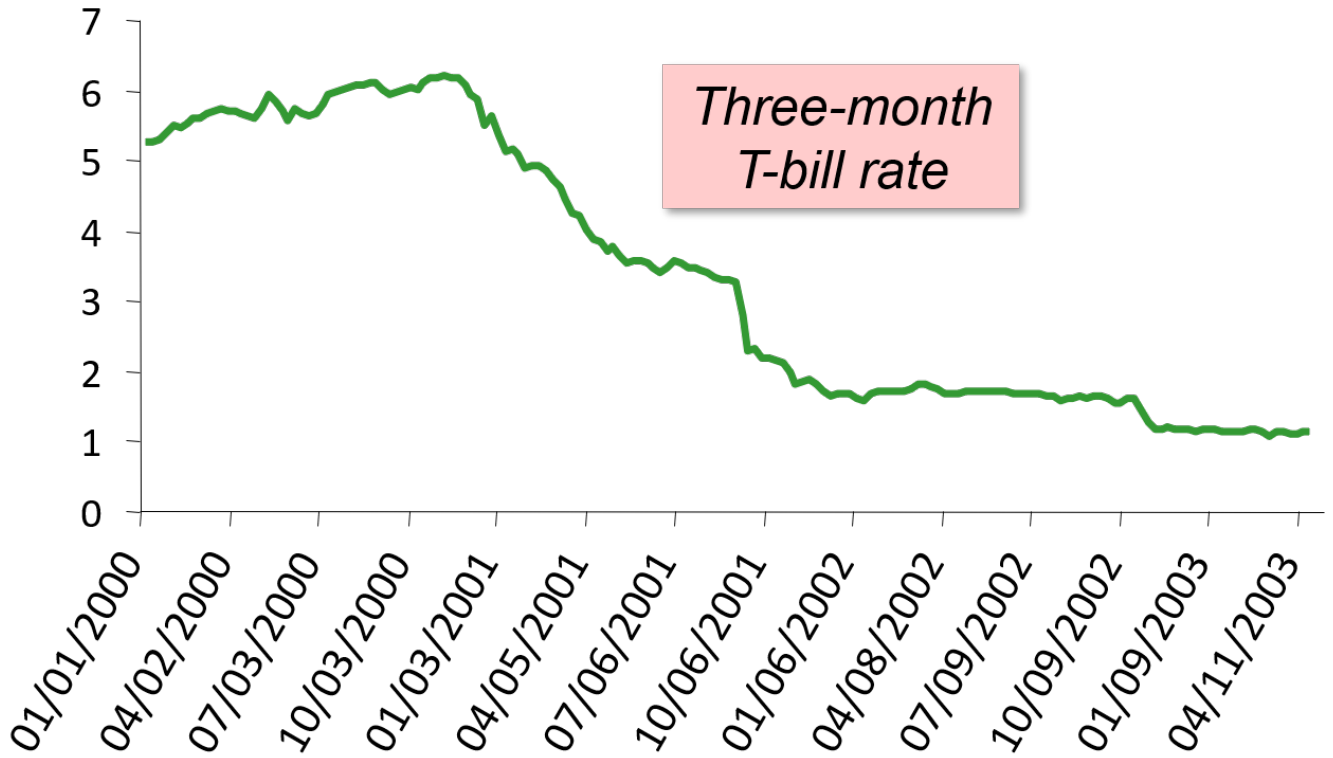
CASE STUDY: The U.S. recession of 2001, part 3

Fiscal policy response: shifted *IS* curve right

- tax cuts in 2001 and 2003
- spending increases
  - airline industry bailout
  - NYC reconstruction
  - Afghanistan war

CASE STUDY: The U.S. recession of 2001, part 4

Monetary policy response: shifted *LM* curve right



What is the Fed's policy instrument?

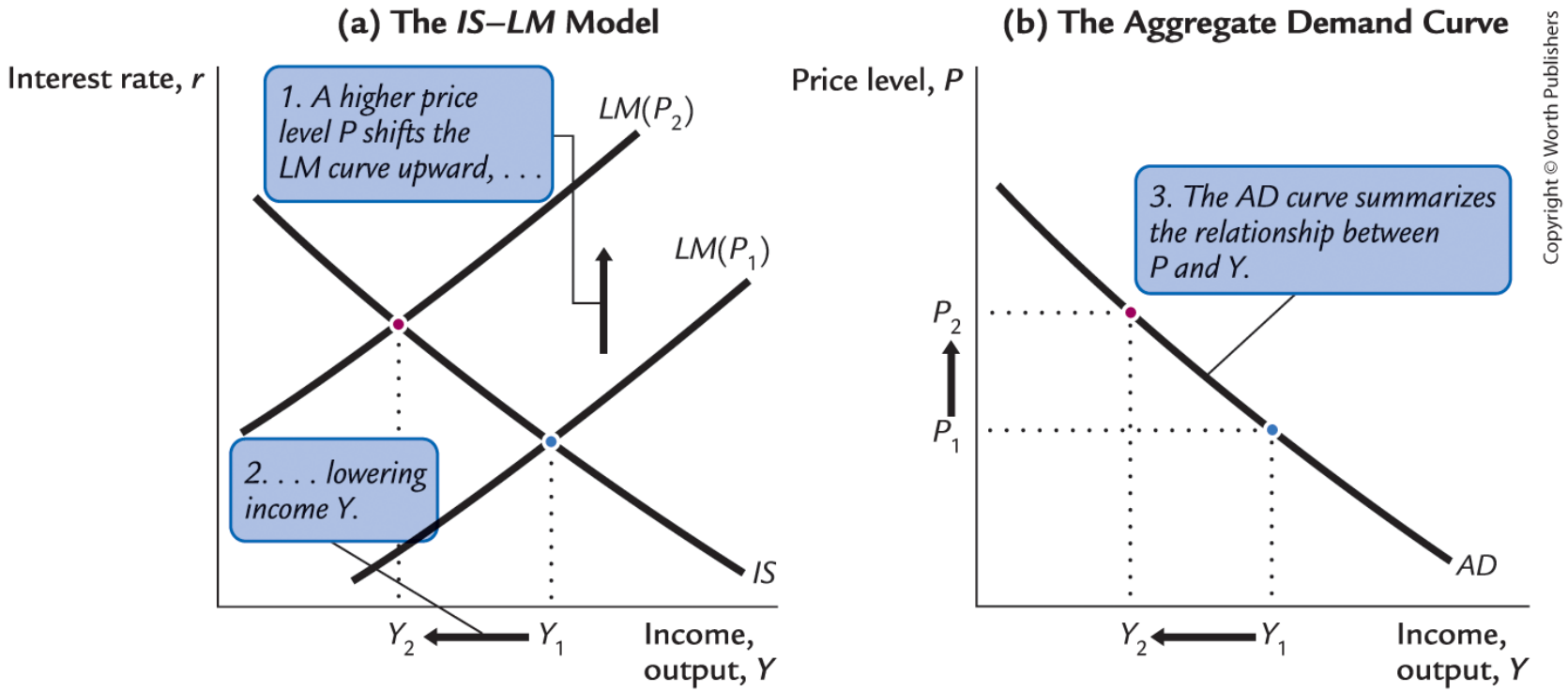
- The news media commonly report the Fed's policy changes as interest rate changes, as if the Fed has direct control over market interest rates.
- In fact, the Fed **targets** the *federal funds rate*—the interest rate banks charge one another on overnight loans.
- The Fed changes the money supply and shifts the *LM* curve to achieve its target.
- Other short-term rates typically move with the federal funds rate.

IS-LM and AD-AS

IS–LM and aggregate demand

- So far, we've been using the *IS–LM* model to analyze the short run, when the price level is assumed to be fixed.
- However, a change in ***P*** would shift *LM* and would therefore affect ***Y*****.**
- The **aggregate demand curve** (*introduced in Chapter 11*) captures this relationship between ***P*** and ***Y****.*

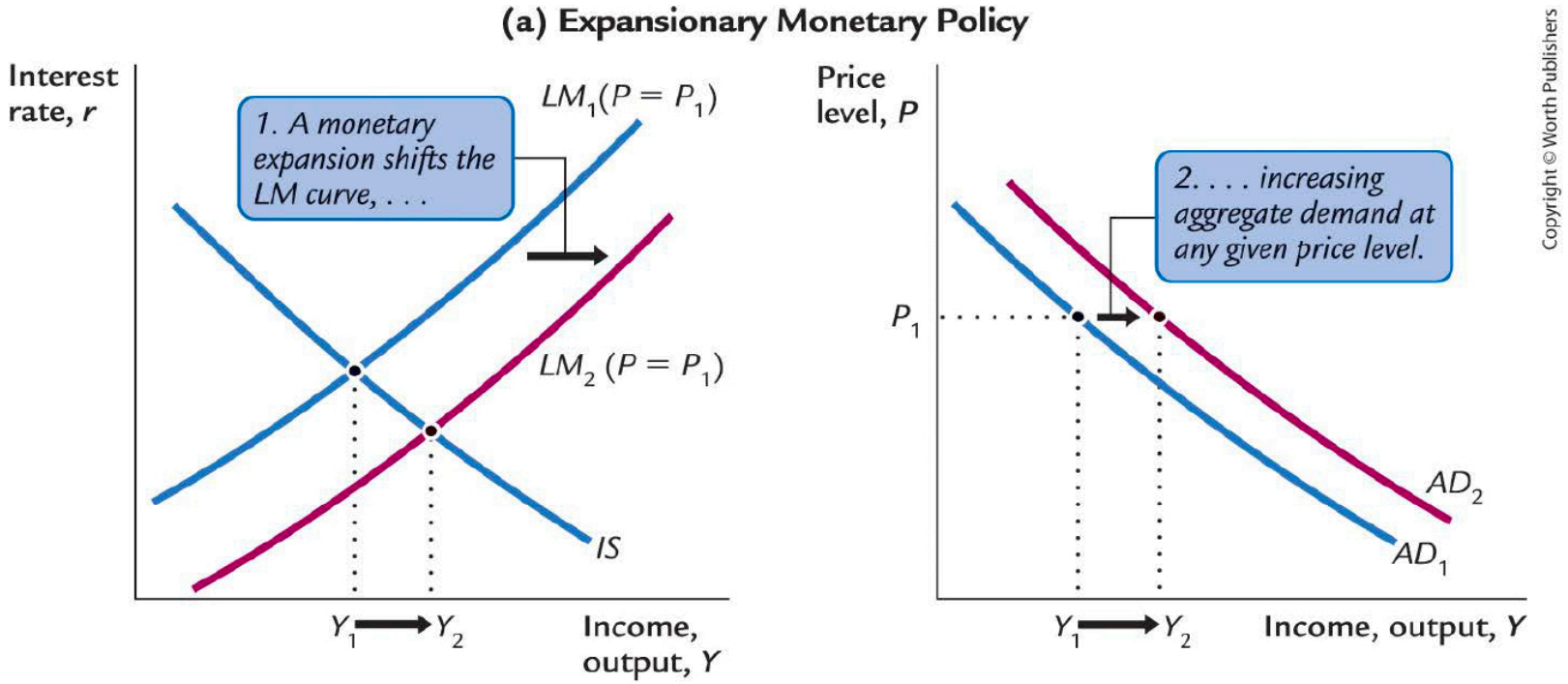
Deriving the *AD* curve



Monetary policy and the *AD* curve

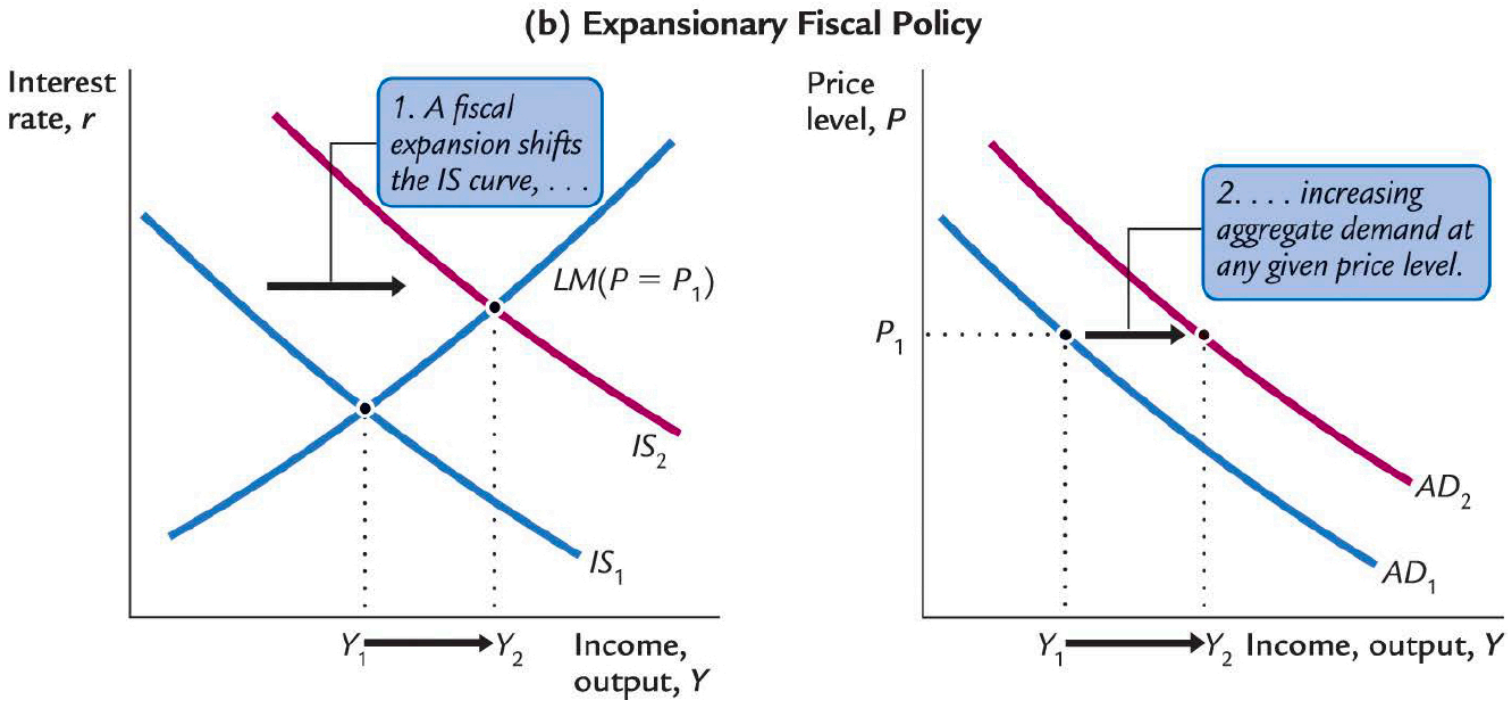
The Fed can increase aggregate demand:

↑***M*** → *LM* shifts right, → ↓***r***, → ↑**I**, → ↑***Y*** at each value of ***P***.



Fiscal policy and the *AD* curve

Expansionary fiscal policy (↑***G*** and/or ↓***T***) increases aggregate demand: ↑***G***, → *IS* shifts right,→ ↑***Y*** at each value of ***P***.



IS–LM and *AD–AS* in the short run and in the long run

The economy is in equilibrium. Then a price shock hits. What happens next?

IS–LM and *AD–AS* in the short run and in the long run

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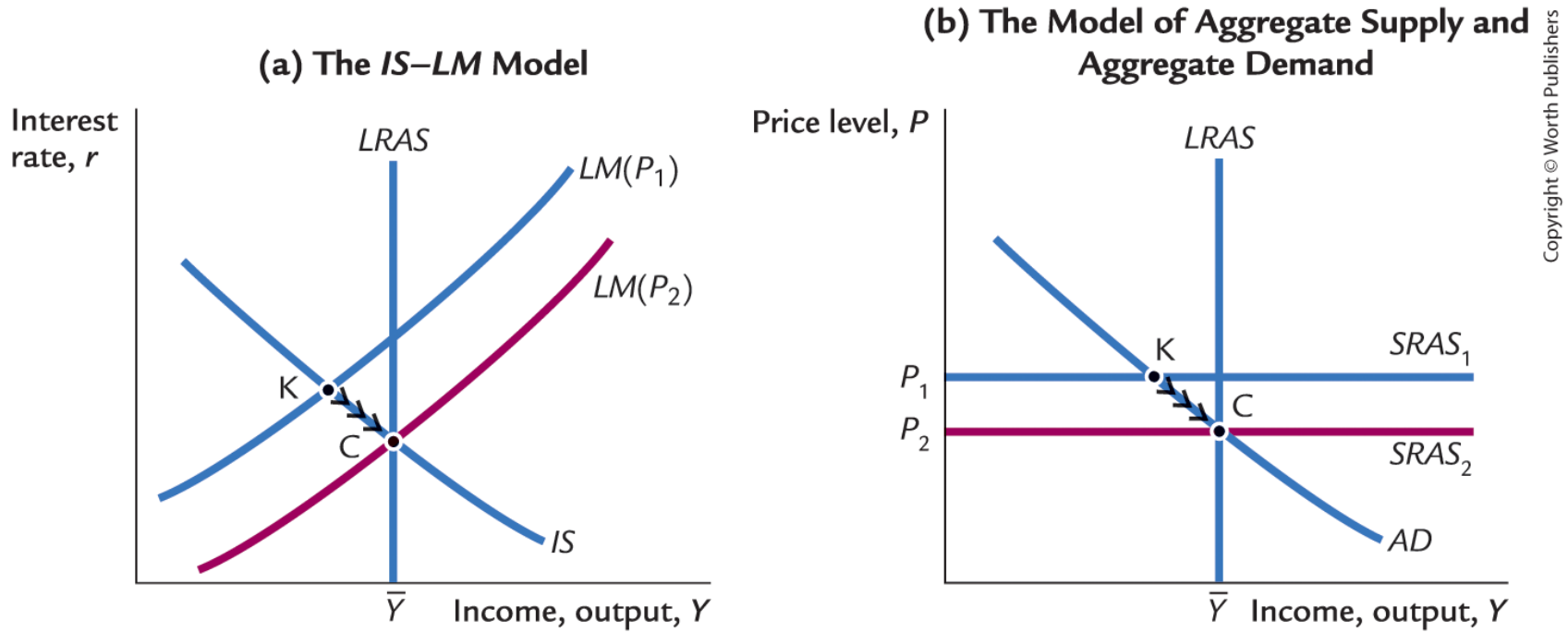
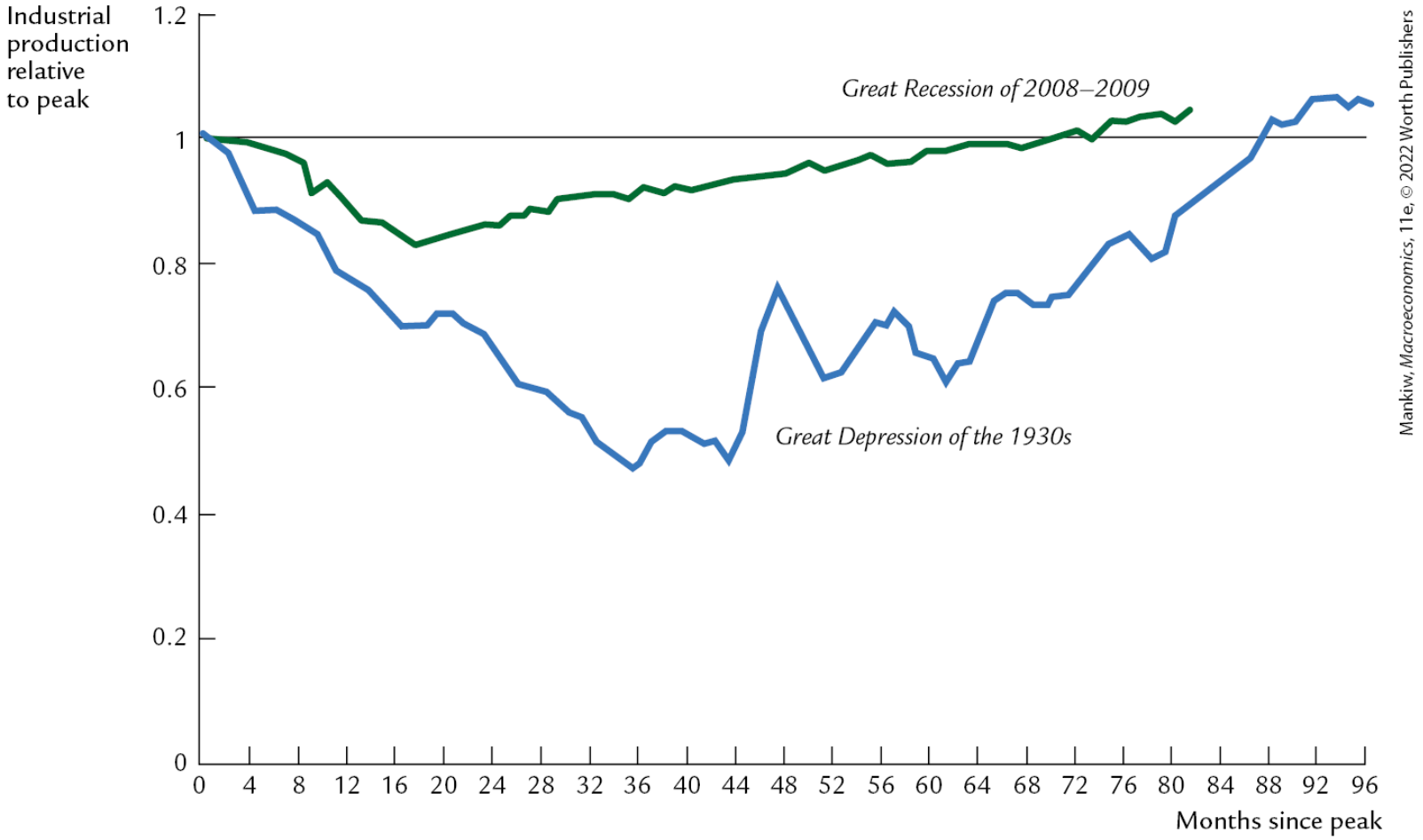


Two case studies



Case study 1: Great Depression

- Spending hypothesis: the Depression was largely due to an exogenous fall in the demand for goods and services—a leftward shift of the *IS* curve.
  - Evidence: Output and interest rates both fell, which is what a leftward *IS* shift would cause.
- Money hypothesis: the Depression was largely due to the huge fall in the money supply—a leftward shift of the *LM* curve.
  - Evidence: *M*1 fell 25 percent during 1929–1933.
  - But, two problems with this hypothesis:
    - ***P*** fell even more, so ***M***/***P*** actually rose slightly during 1929–1931.
    - Nominal interest rates fell, which is the opposite of what a leftward *LM* shift would cause.

The impact of deflation on the economy (1 of 3)

- The stabilizing effects of deflation:
- ↓***P*** → ↑(***M/P***) → *LM* shifts right → ↑***Y***
- **Pigou effect**:

  ↓***P*** → ↑(***M/P***)

  → consumers' wealth ↑

  → ↑***C***

  → *IS* shifts right

  → ↑***Y***

The impact of deflation on the economy (2 of 3)

The destabilizing effects of expected deflation:

↓$E\,\pi$

→ r ↑ for each value of i

→ **I** ↓ because $I = I(r)$

→ planned expenditure and aggregate demand ↓

→ income and output ↓

The impact of deflation on the economy (3 of 3)

The destabilizing effects of unexpected deflation:

debt-deflation theory

↓***P*** (if unexpected)

→ transfers purchasing power from borrowers to lenders

→ borrowers spend less, lenders spend more

→ if borrowers' propensity to spend is larger than lenders', then aggregate spending falls, the *IS* curve shifts left, and ***Y*** falls

Case study 2: The Great Recession (1 of 2)

- 2009: real GDP fell, unemployment rate approached 10 percent.
- Important factors in the crisis:
  - early 2000s Federal Reserve interest rate policy
  - subprime mortgage crisis
  - bursting of house price bubble, rising foreclosure rates
  - falling stock prices
  - failing financial institutions
  - declining consumer confidence, drop in spending on consumer durables and investment goods

Case study 2: The Great Recession (2 of 2)

- Fiscal policy:
  - American Recovery and Reinvestment Act (ARRA) was $787 billion passed in early 2009.
  - Yet, later in 2010–2014, government spending decreased due to austerity measures (over a $300 billion drop).
- Monetary policy:
  - Lowered the federal funds rate to zero
  - Engaged in nontraditional monetary policy (forward guidance and quantitative easing)

SUMMARY, PART 1

- *IS–LM* model
  - a theory of aggregate demand
  - exogenous: ***M***, ***G***, ***T***,
    P exogenous in short run, ***Y*** in long run
  - endogenous: ***r,***
    Y endogenous in short run, ***P*** in long run
  - *IS* curve: goods market equilibrium
  - *LM* curve: money market equilibrium

SUMMARY, PART 2

AD curve

- shows relationship between $\boldsymbol{P}$ and the *IS–LM* model's equilibrium $\boldsymbol{Y}$.
- negative slope because
  $\uparrow \boldsymbol{P} \rightarrow \downarrow(\boldsymbol{M/P}) \rightarrow \uparrow \boldsymbol{r} \rightarrow \downarrow \boldsymbol{I} \rightarrow \downarrow \boldsymbol{Y}$
- expansionary fiscal policy shifts *IS* curve right, raises income, and shifts *AD* curve right.
- expansionary monetary policy shifts *LM* curve right, raises income, and shifts *AD* curve right.
- *IS* or *LM* shocks shift the *AD* curve.