

Having Built Up the ISLM

...what does the model predict

Equilibrium in the *IS-LM* Model

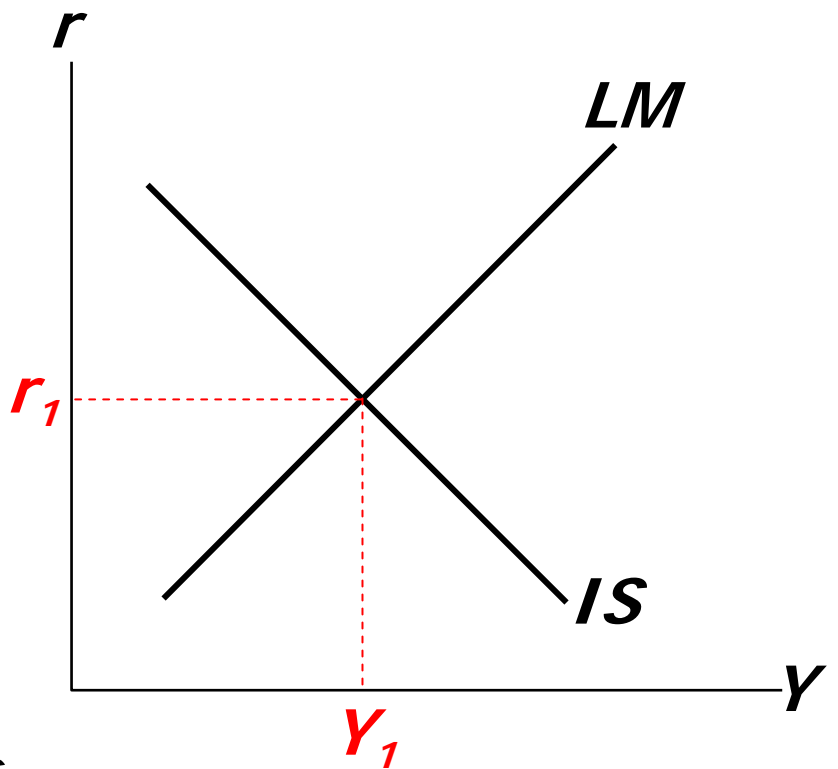
The *IS* curve represents equilibrium in the goods market.

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

The *LM* curve represents money market equilibrium.

$$M_{Demand} = M_{Supply}$$

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

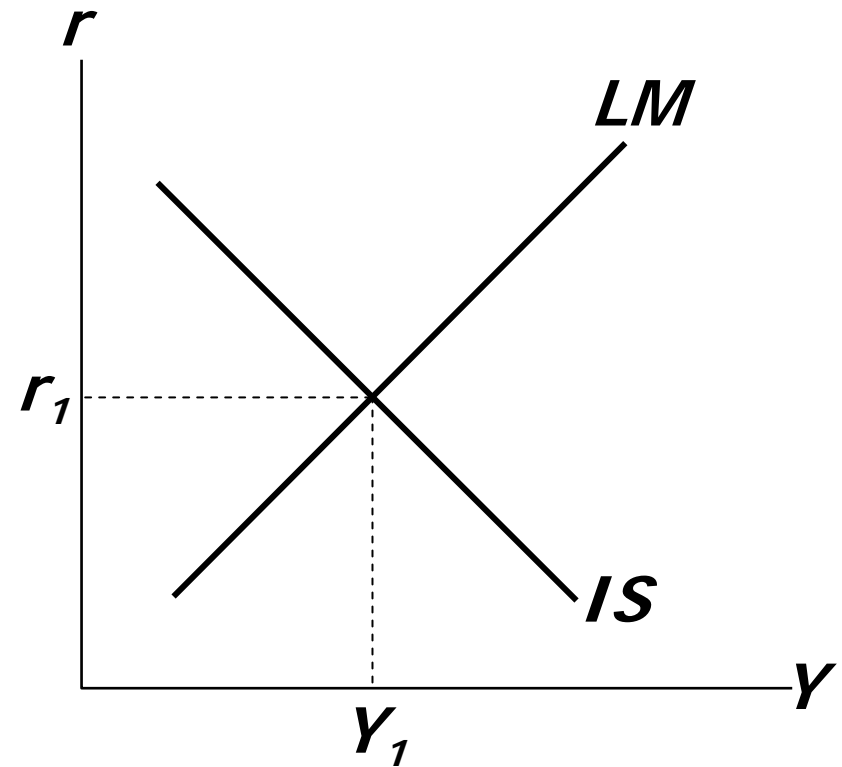


Policy analysis with the *IS-LM* Model

Policymakers can affect macroeconomic variables with

- fiscal policy: G and/or T (*generally shifts IS*)
- monetary policy: M (*generally shifts LM*)

We can use the *IS-LM* model to analyze the effects of these policies.



An increase in government purchases

1. IS curve shifts right

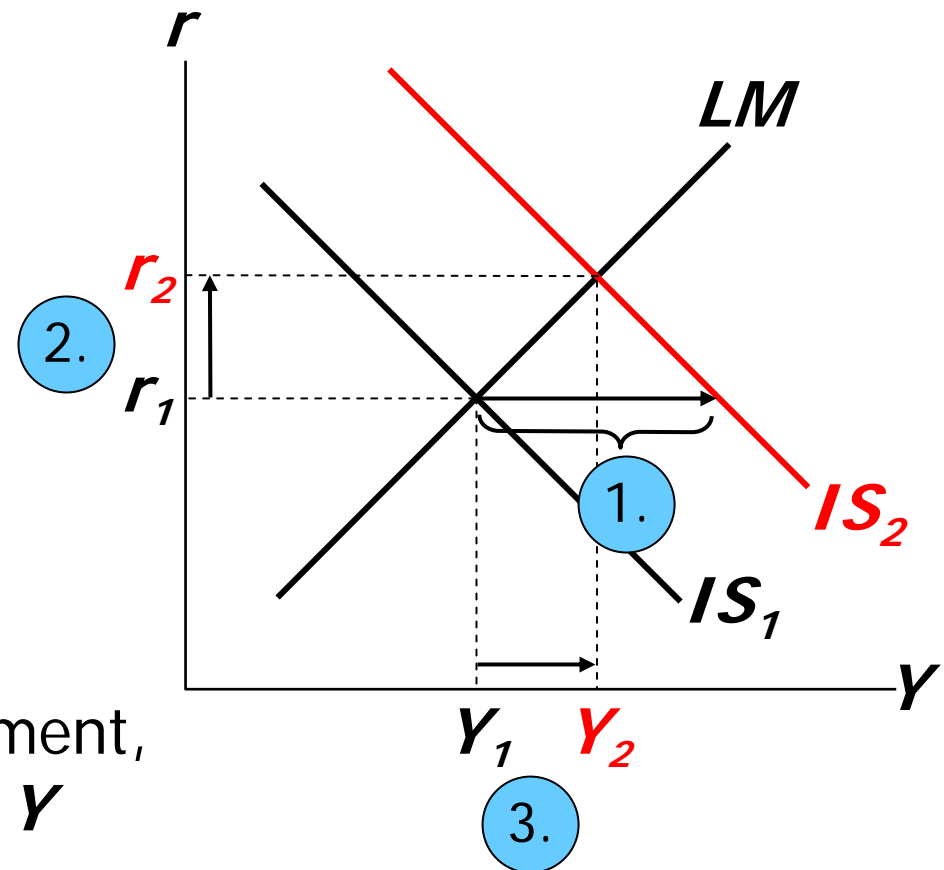
$$\text{by } \frac{1}{1-MPC} \Delta G$$

causing output & income to rise.

2. This raises money demand, causing the interest rate to rise...

3. ...which reduces investment, so the final increase in Y

$$\text{is smaller than } \frac{1}{1-MPC} \Delta G$$



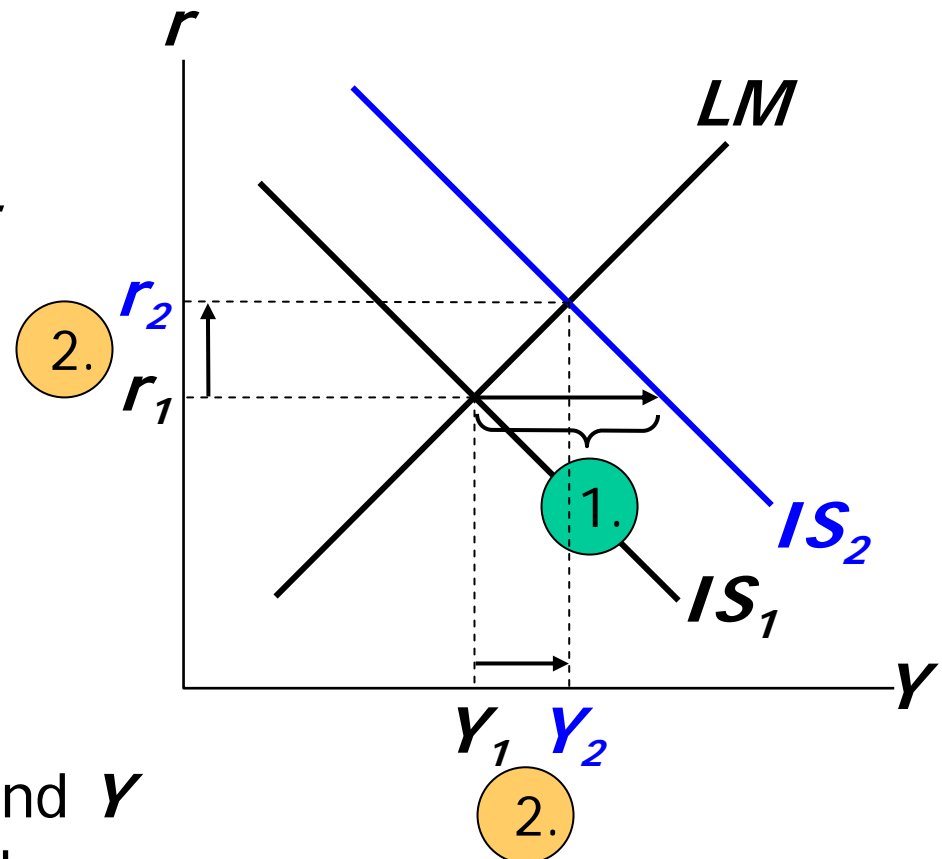
A tax cut

Because consumers save $(1-MPC)$ of the tax cut, the initial boost in spending is smaller for ΔT than for an equal ΔG ...

and the IS curve shifts by

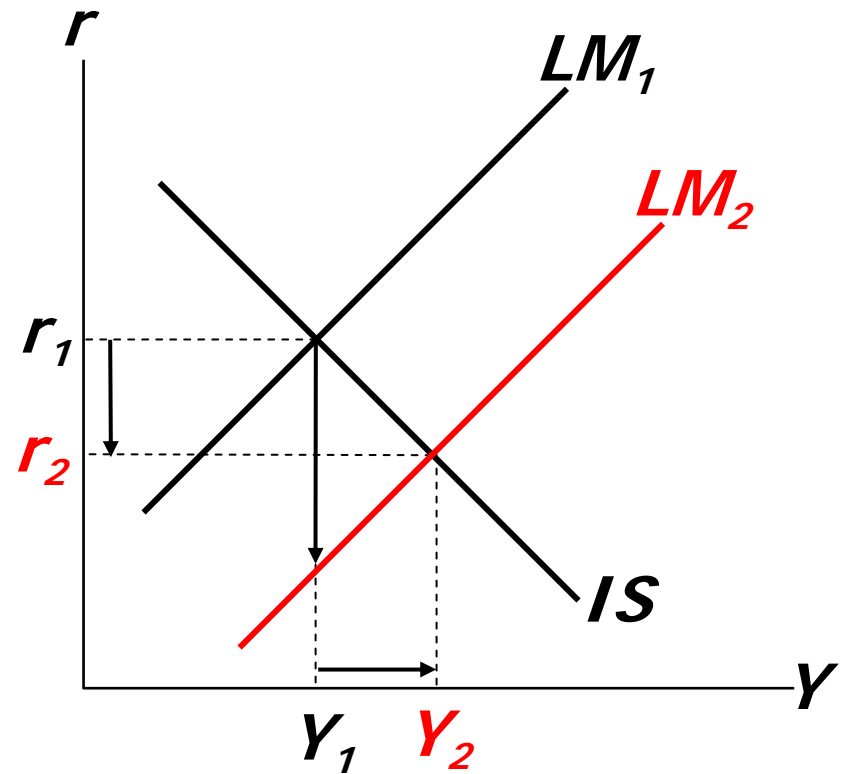
1.
$$\frac{-MPC}{1-MPC} \Delta T$$

2. ...so the effects on r and Y are smaller for a ΔT than for an equal ΔG .



Monetary Policy: an increase in M

1. $\Delta M > 0$ shifts the LM curve down (or to the right)
2. ...causing the interest rate to fall
3. ...which increases investment, causing output & income to rise.



Interaction between monetary & fiscal policy

- Model:
monetary & 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. (*things happen together...and many
of them as well*)
- Such interaction may alter the impact of the
original policy change.

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

- Suppose Congress increases G .
- Possible Fed responses:
 1. hold M constant
 2. hold r constant
 3. hold Y constant
- In each case, the effects of the ΔG are different:

Response 1: hold M constant

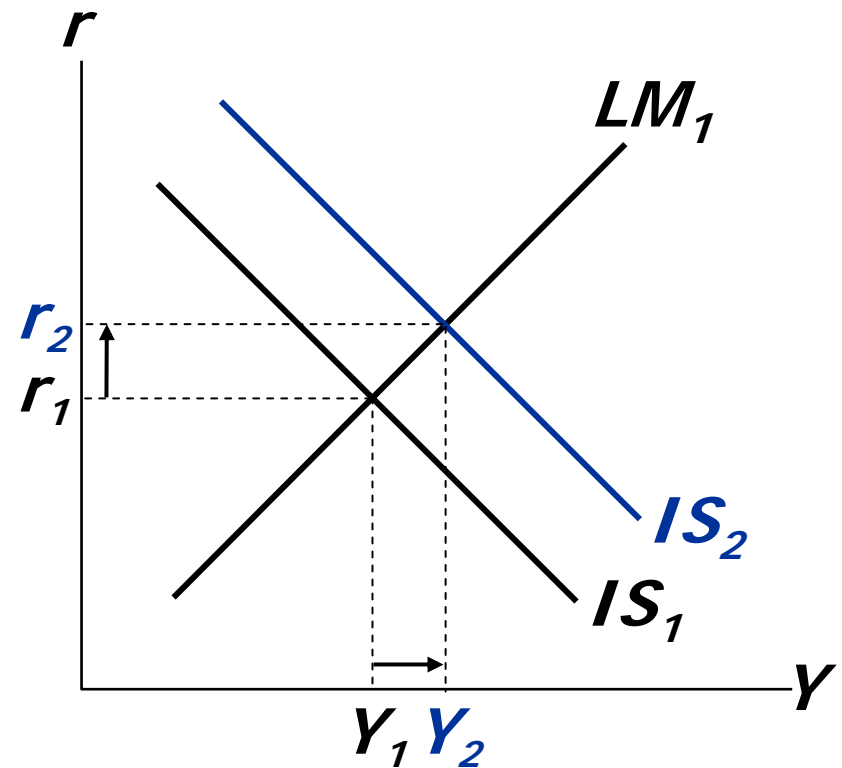
If Congress raises G ,
the IS curve shifts
right

If Fed holds M
constant, then LM
curve doesn't shift.

Results:

$$\Delta Y = Y_2 - Y_1$$

$$\Delta r = r_2 - r_1$$



Response 2: hold r constant

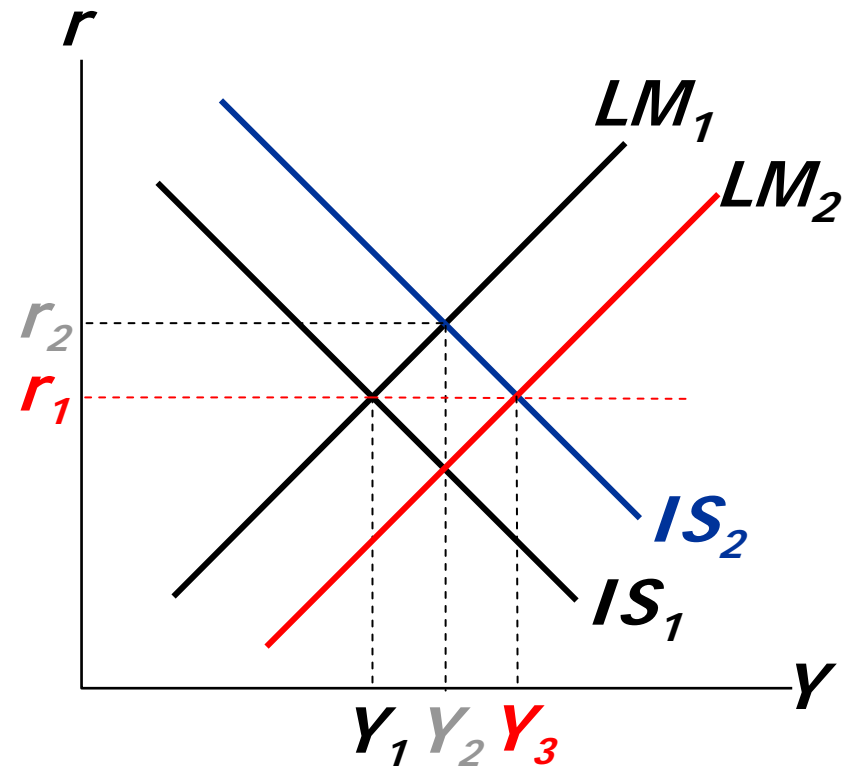
If Congress raises G ,
the IS curve shifts
right

To keep r constant,
Fed increases M to
shift LM curve right.

Results:

$$\Delta Y = Y_3 - Y_1$$

$$\Delta r = 0$$



Response 3: hold Y constant

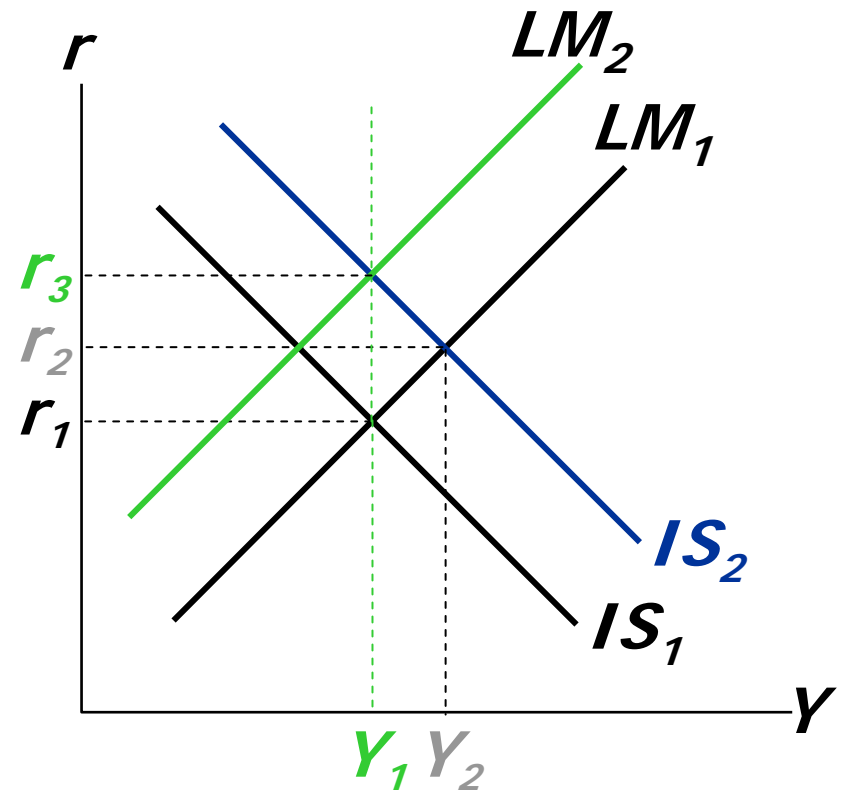
If Congress raises G ,
the IS curve shifts
right

To keep Y constant,
Fed reduces M to
shift LM curve left.

Results:

$$\Delta Y = 0$$

$$\Delta r = r_3 - r_1$$



Shocks in the *IS-LM* Model

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

Examples:

- stock market boom or crash
 - ⇒ change in households' wealth
 - ⇒ ΔC
- change in business or consumer confidence or expectations
 - ⇒ ΔI and/or ΔC

Shocks in the *IS-LM* Model

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

Examples:

- a wave of credit card fraud increases demand for money
- more ATMs or the Internet reduce money demand

CASE STUDY

The U.S. economic slowdown of 2001

~ What happened ~

1. Real GDP growth rate

1994-2000: 3.9% (average annual)

2001: 0.8% for the year,

March 2001 determined to be the end of the longest expansion on record.

2. Unemployment rate

Dec 2000: 3.9%

Dec 2001: 5.8%

The number of unemployed people rose by 2.1 million during 2001!

CASE STUDY

The U.S. economic slowdown of 2001

~Shocks that contributed to the slowdown~

1. Falling stock prices

From Aug 2000 to Aug 2001: -25%

Week after 9/11: -12%

2. The terrorist attacks on 9/11

- increased uncertainty
- fall in consumer & business confidence

Both shocks reduced spending and shifted the IS curve left.

CASE STUDY

The U.S. economic slowdown of 2001

~ *The policy response* ~

1. Fiscal policy

- large long-term tax cut, immediate \$300 rebate checks
- spending increases: aid to New York City & the airline industry, war on terrorism

2. Monetary policy

- Fed lowered its Fed Funds rate target 11 times during 2001, from 6.5% to 1.75%
- Money growth increased, interest rates fell

CASE STUDY

The U.S. economic slowdown of 2001

~ The recovery ~

- The recession officially ended in November 2001.
- Real GDP recovered, growing 2.3% in 2002 and 4.4% in 2003.
- The unemployment rate lagged: 5.8% in 2002, 6.0% in 2003.
- The Fed cut interest rates in 11/02 and 6/03.
- Unemployment finally appears to be responding: 5.6% for the first half of 2004.

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 fixed.
- However, a change in P would shift the *LM* curve and therefore affect Y .
- The **aggregate demand curve** (*introduced in chap. 9*) captures this relationship between P and Y

Deriving the *AD* curve

Intuition for slope
of *AD* curve:

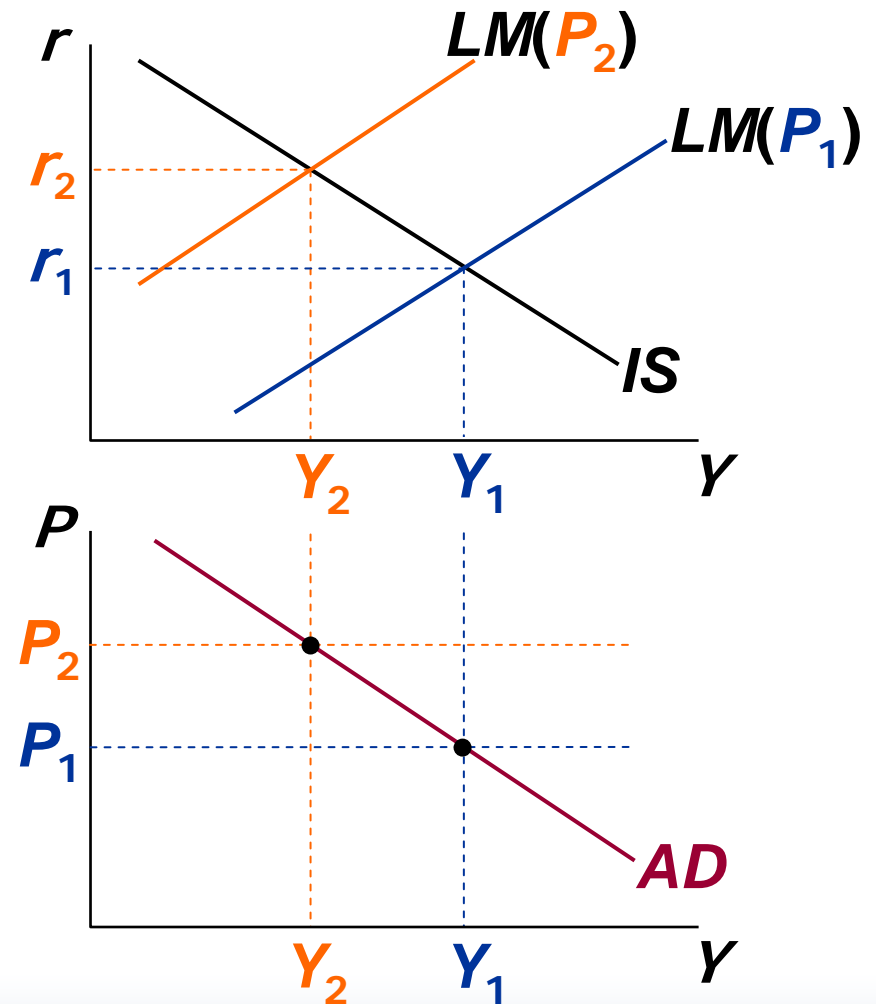
$\uparrow P \Rightarrow \downarrow (M/P)$

$\Rightarrow LM$ shifts left

$\Rightarrow \uparrow r$

$\Rightarrow \downarrow I$

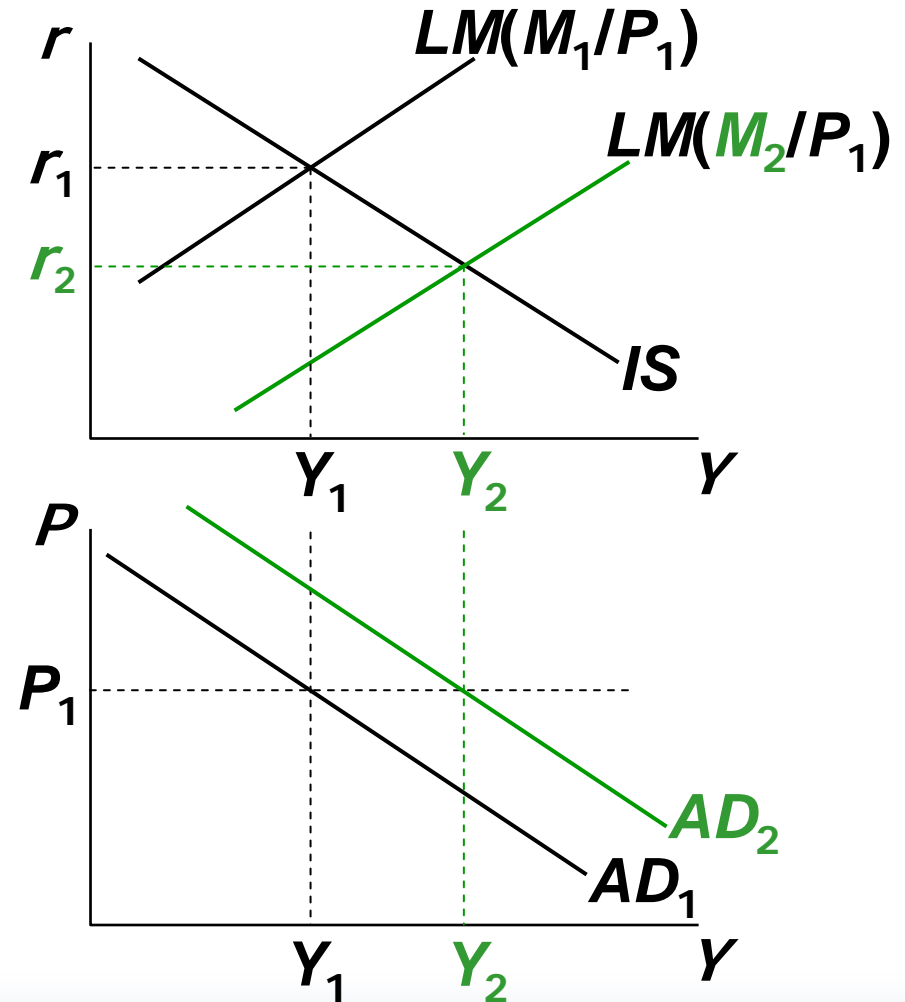
$\Rightarrow \downarrow Y$



Monetary policy and the AD curve

The Fed can increase aggregate demand:

$\uparrow M \Rightarrow LM$ shifts right
 $\Rightarrow \downarrow r$
 $\Rightarrow \uparrow I$
 $\Rightarrow \uparrow Y$ at each value of P



Fiscal policy and the AD curve

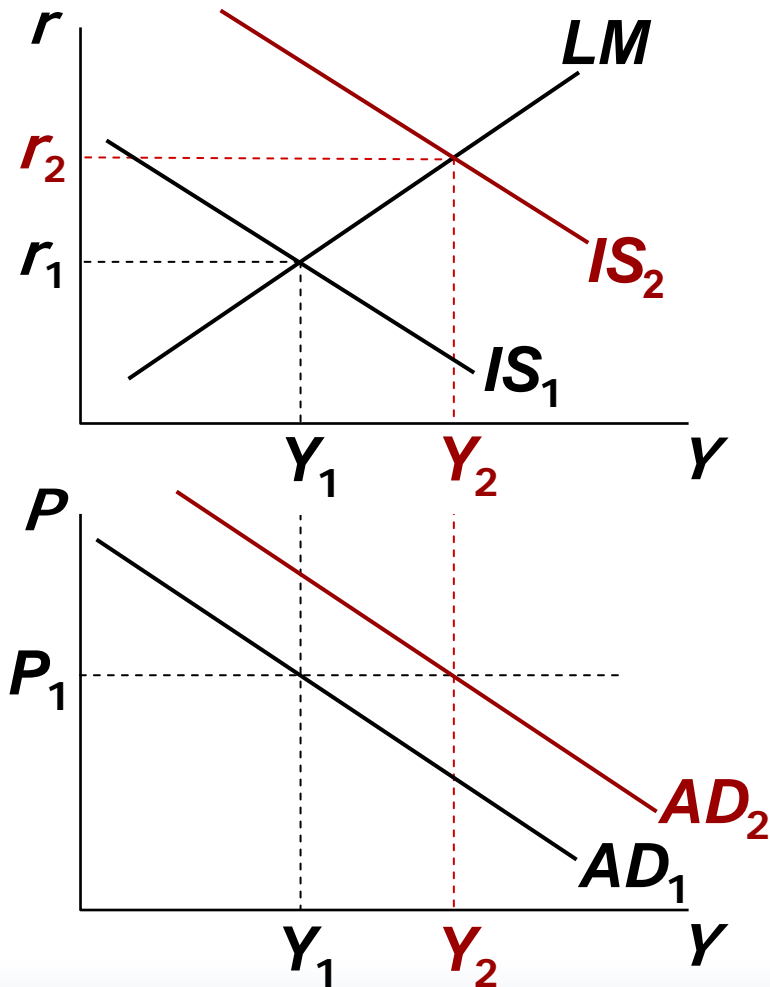
Expansionary fiscal policy
($\uparrow G$ and/or $\downarrow T$)

increases agg. demand:

$\downarrow T \Rightarrow \uparrow C$

\Rightarrow IS shifts right

$\Rightarrow \uparrow Y$ at each
value of P



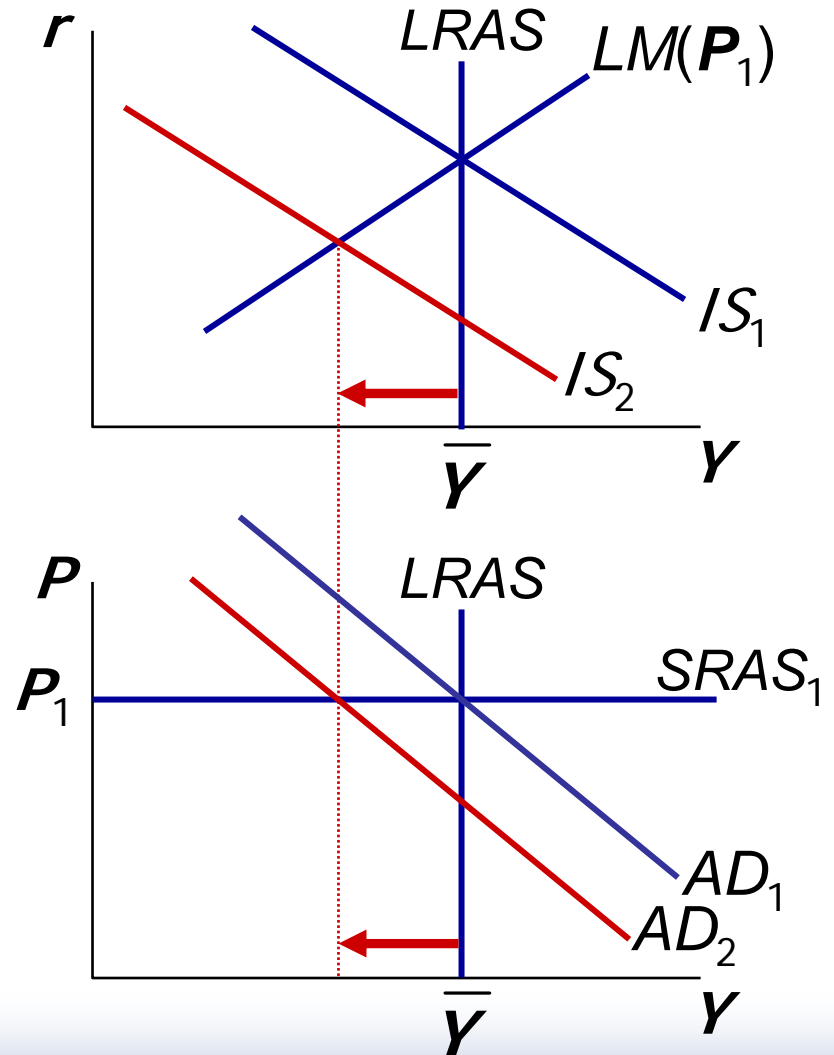
IS-LM and AD-AS in the short run & long run

Recall from Chapter 9: The force that moves the economy from the short run to the long run is the gradual adjustment of prices.

In the short-run equilibrium, if	then over time, the price level will
$Y > \bar{Y}$	rise
$Y < \bar{Y}$	fall
$Y = \bar{Y}$	remain constant

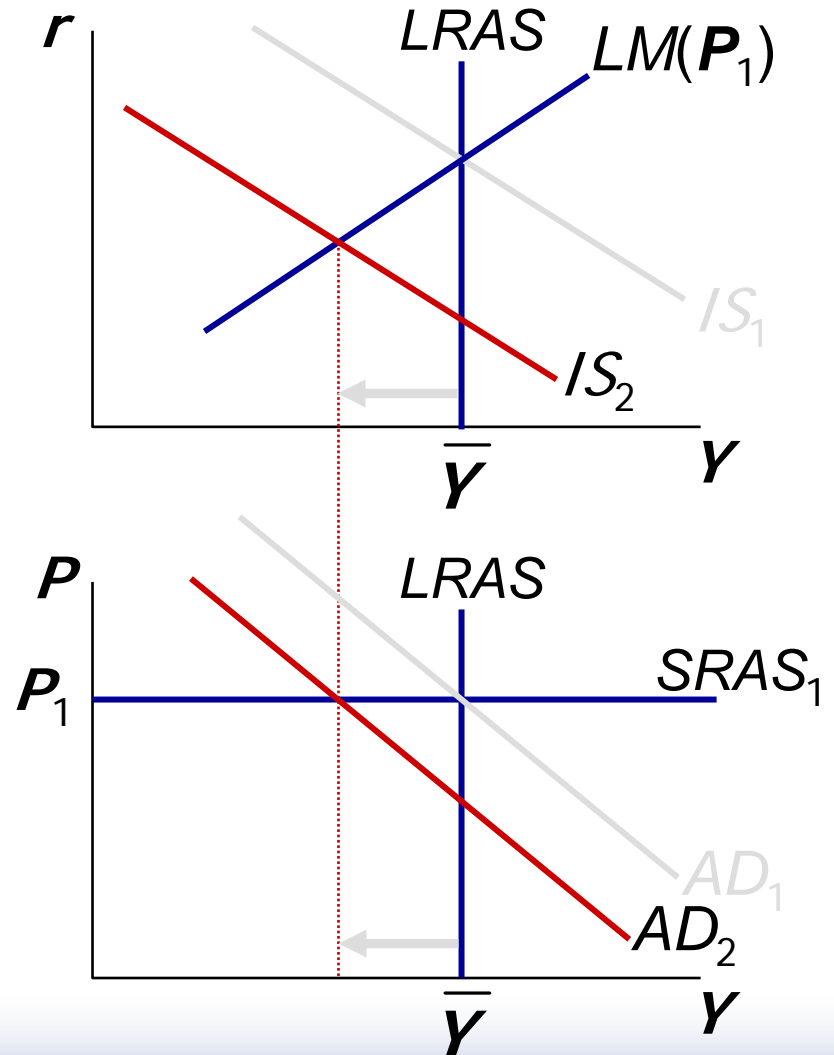
The SR and LR effects of an *IS* shock

A negative *IS* shock shifts *IS* and *AD* left, causing *Y* to fall.



The SR and LR effects of an *IS* shock

In the new short-run equilibrium, $Y < \bar{Y}$

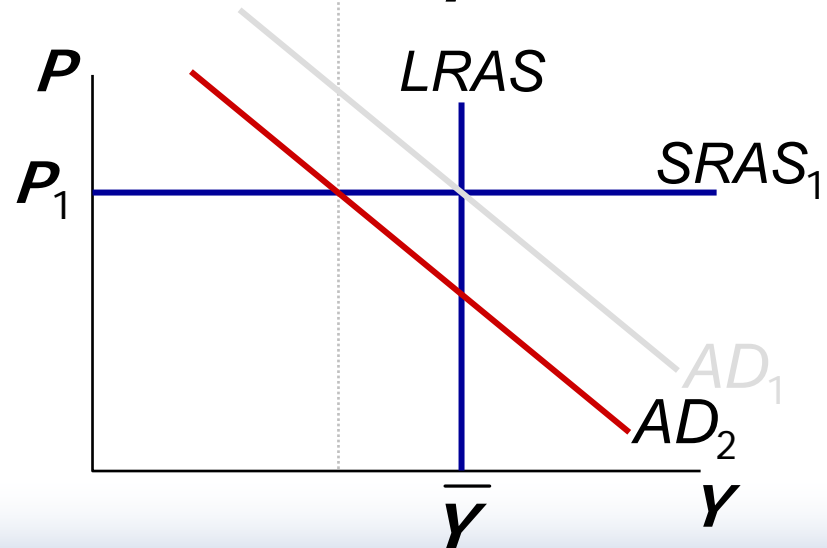
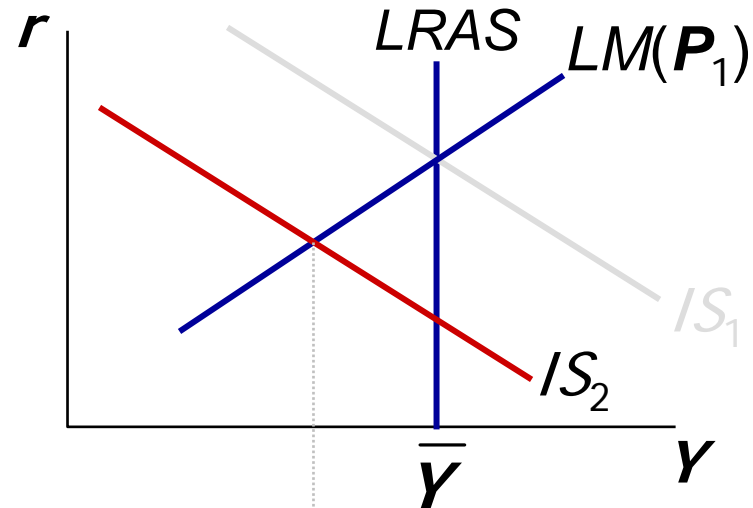


The SR and LR effects of an *IS* shock

In the new short-run equilibrium, $Y < \bar{Y}$

Over time,
 P gradually falls,
which causes

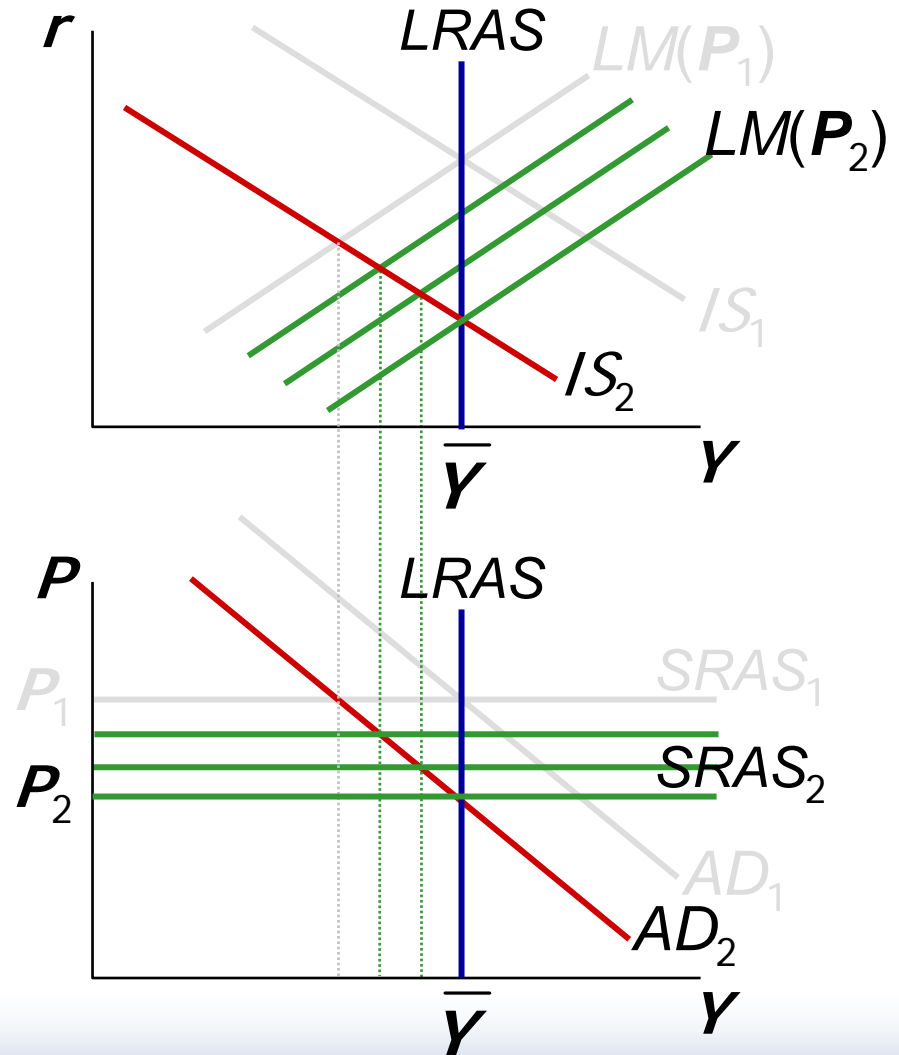
- $SRAS$ to move down
- M/P to increase,
which causes LM
to move down



The SR and LR effects of an *IS* shock

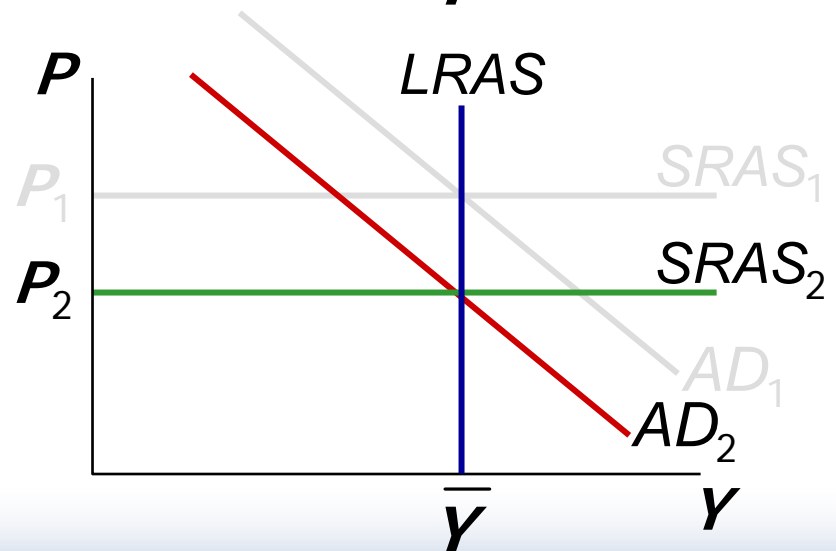
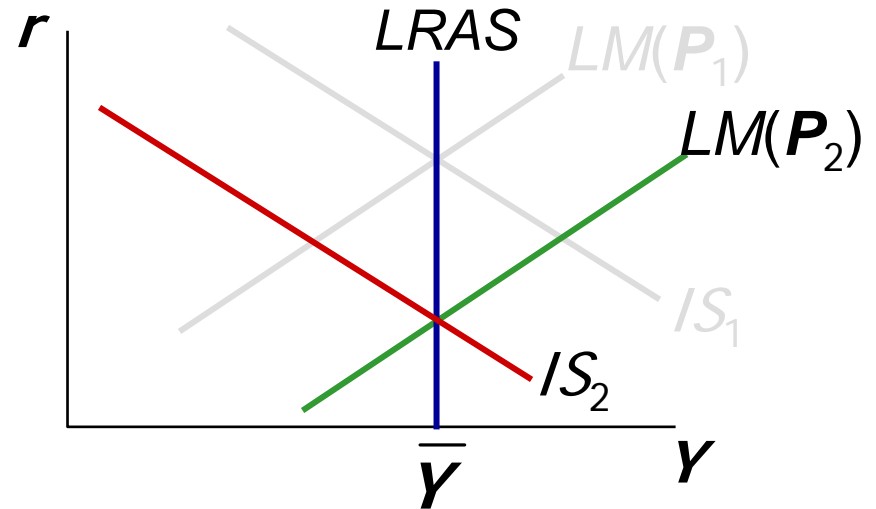
Over time,
 P gradually falls,
which causes

- *SRAS* to move down
- M/P to increase,
which causes *LM*
to move down



The SR and LR effects of an *IS* shock

This process continues until economy reaches a long-run equilibrium with $Y = \bar{Y}$



Chapter summary

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

Chapter summary

2. AD curve

- shows relation between P and the $IS-LM$ model's equilibrium Y .
- negative slope because
 $\uparrow P \Rightarrow \downarrow (M/P) \Rightarrow \uparrow r \Rightarrow \downarrow I \Rightarrow \downarrow Y$
- 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