AD continued (Ch.11)

- Use the IS-LM model to
  - see how policies and shocks affect income and the interest rate in the short run when prices are fixed
  - derive the aggregate demand curve
  - explore various explanations for the Great Depression

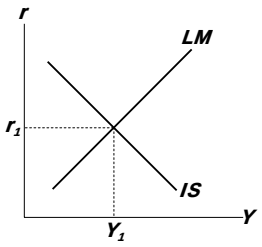
Policy analysis with the *IS-LM* Model

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

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

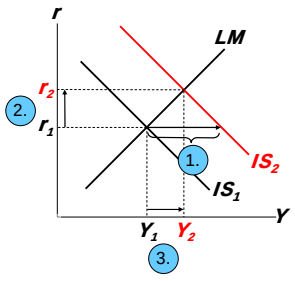
Policymakers can affect macroeconomic variables with

- G and/or T
- M



An increase in G

1. *IS* curve shifts right by $\frac{1}{1-\text{MPC}} \Delta G$
2. This raises M^D
3. ...which reduces I, final increase in Y smaller



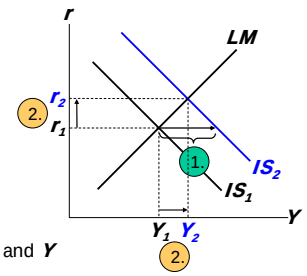
A tax cut

Initial boost in C smaller for ΔT than for an equal ΔG...

IS curve shifts by

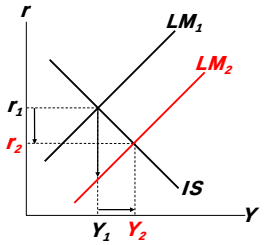
1. $\frac{-\text{MPC}}{1-\text{MPC}} \Delta T$

2. ...so the effects on r and Y are smaller...



Monetary Policy: an increase in *M*

1. $\Delta M > 0$ shifts the *LM* curve down
2. r falls
3. Output rises



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.
- 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:

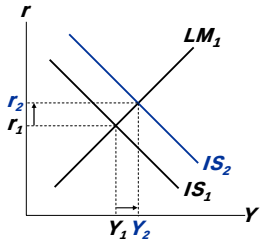
↑G Response 1: hold M constant

Fed keeps M constant

Results:

$\Delta Y = Y_2 - Y_1$

$\Delta r = r_2 - r_1$



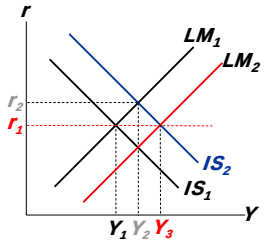
↑G Response 2: hold r constant

Fed increases M

Results:

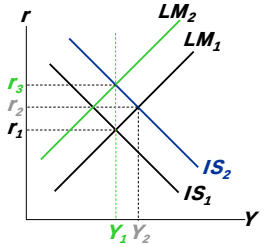
$\Delta Y = Y_3 - Y_1$

$\Delta r = 0$



↑G Response 3: hold *Y* constant

Fed reduces ***M***



Results:

$\Delta Y = 0$

$\Delta r = r_3 - r_1$

Shocks in the *IS-LM* Model

***IS* shocks**: exogenous changes in demand for goods

Examples:

- stock market boom or crash
  ⇒ change in households' wealth
  ⇒ ΔC
- change in 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

What is the Fed's policy instrument?

The Fed targets the Federal Funds rate:
it announces a target value + uses monetary policy to shift LM to attain target rate.

Why does the Fed target interest rates?

1) r easier to measure

2) Fed might believe that *LM* shocks are more prevalent than *IS* shocks. If so, targeting r stabilizes Y better than targeting the M.
(See Problem 7 on p.306)

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:

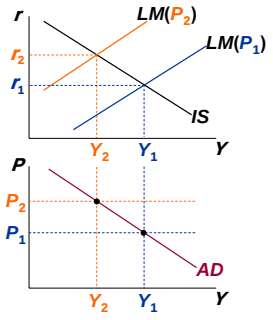
$\uparrow P \Rightarrow \downarrow(M/P)$

$\Rightarrow$ *LM* shifts left

$\Rightarrow \uparrow r$

$\Rightarrow \downarrow I$

$\Rightarrow \downarrow Y$



Monetary policy and the *AD* curve

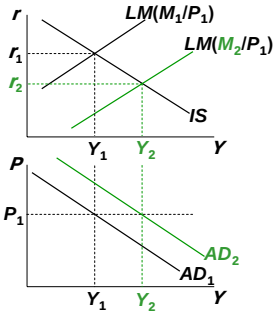
The Fed can increase aggregate demand:

↑***M*** ⇒ *LM* shifts right

⇒ ↓***r***

⇒ ↑***I***

⇒ ↑***Y*** at each value of ***P***



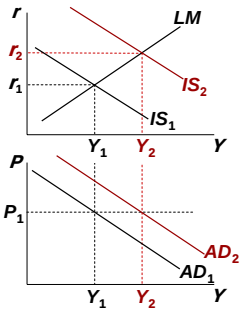
Fiscal policy and the *AD* curve

Expansionary fiscal policy (↑***G*** and/or ↓***T***) increases agg. demand:

↓***T*** ⇒ ↑***C***

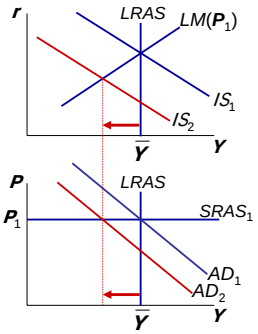
⇒ IS shifts right

⇒ ↑***Y*** at each value of ***P***



SR and LR effects of a negative *IS* shock

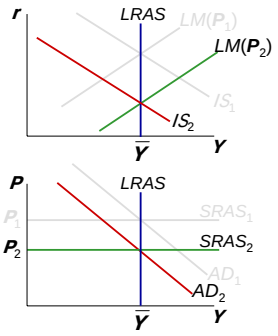
A negative *IS* shock shifts *IS* and *AD* left, causing ***Y*** to fall.



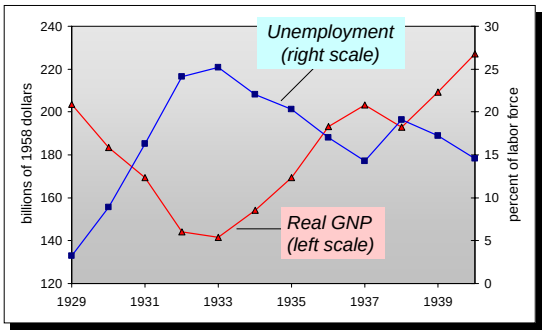
The SR and LR effects of an *IS* shock

Over time, P falls (since Y below eq'm level)

This process continues until economy reaches a long-run equilibrium with Y equal to Ybarl



The Great Depression



The Spending Hypothesis: *Shocks to the IS Curve*

LEFTWARD SHIFT of the *IS* curve

Why?

1. Stock market crash ⇒ exogenous ↓***C*** (1929-1933: S&P 500 fell 71%)
2. Drop in investment (bank failures made it harder to obtain financing for investment)
3. Contractionary fiscal policy: politicians raised tax rates and cut spending

EVIDENCE: output and interest rates both fell, which is what a leftward *IS* shift would cause

The Money Hypothesis: *A Shock to the LM Curve*

- the Depression was largely due to huge fall in the money supply
- evidence:
  M1 fell 25% during 1929-33.

But, two problems with this hypothesis:

1. ***P*** fell even more, ***M/P*** actually rose slightly during 1929-31.
2. nominal interest rates fell, which is the opposite of what would result from a leftward *LM* shift.

The Money Hypothesis Again: *The Effects of Falling Prices*

- asserts that the severity of the Depression was due to a huge deflation:

  P fell 25% during 1929-33.

- This deflation was probably caused by the fall in ***M***, so perhaps money played an important role after all.
- Can deflation be bad?

The Money Hypothesis Again: *The Effects of Falling Prices*

THE GOOD SIDE OF DEFLATION

Pigou effect: $\downarrow P \Rightarrow \uparrow(M/P) \Rightarrow \uparrow C \Rightarrow$ *IS* shifts right $\Rightarrow \uparrow Y$

THE BAD SIDE

debt-deflation theory: unexpected deflation

$\downarrow P$ (if unexpected) $\Rightarrow$ transfers purchasing power from borrowers to lenders $\Rightarrow$ if borrowers' MPC > lenders MPC $\rightarrow$ aggregate spending falls $\rightarrow$ *IS* left $\rightarrow Y$ falls

Expected deflation: $\downarrow \pi^e \rightarrow r \uparrow \Rightarrow I \downarrow \Rightarrow$ income & output $\downarrow$

Chapter summary

1. *IS-LM* model
   - a theory of aggregate demand
   - *IS* curve: goods market equilibrium
   - *LM* curve: money market equilibrium

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