IS-LM Equilibrium

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Objectives

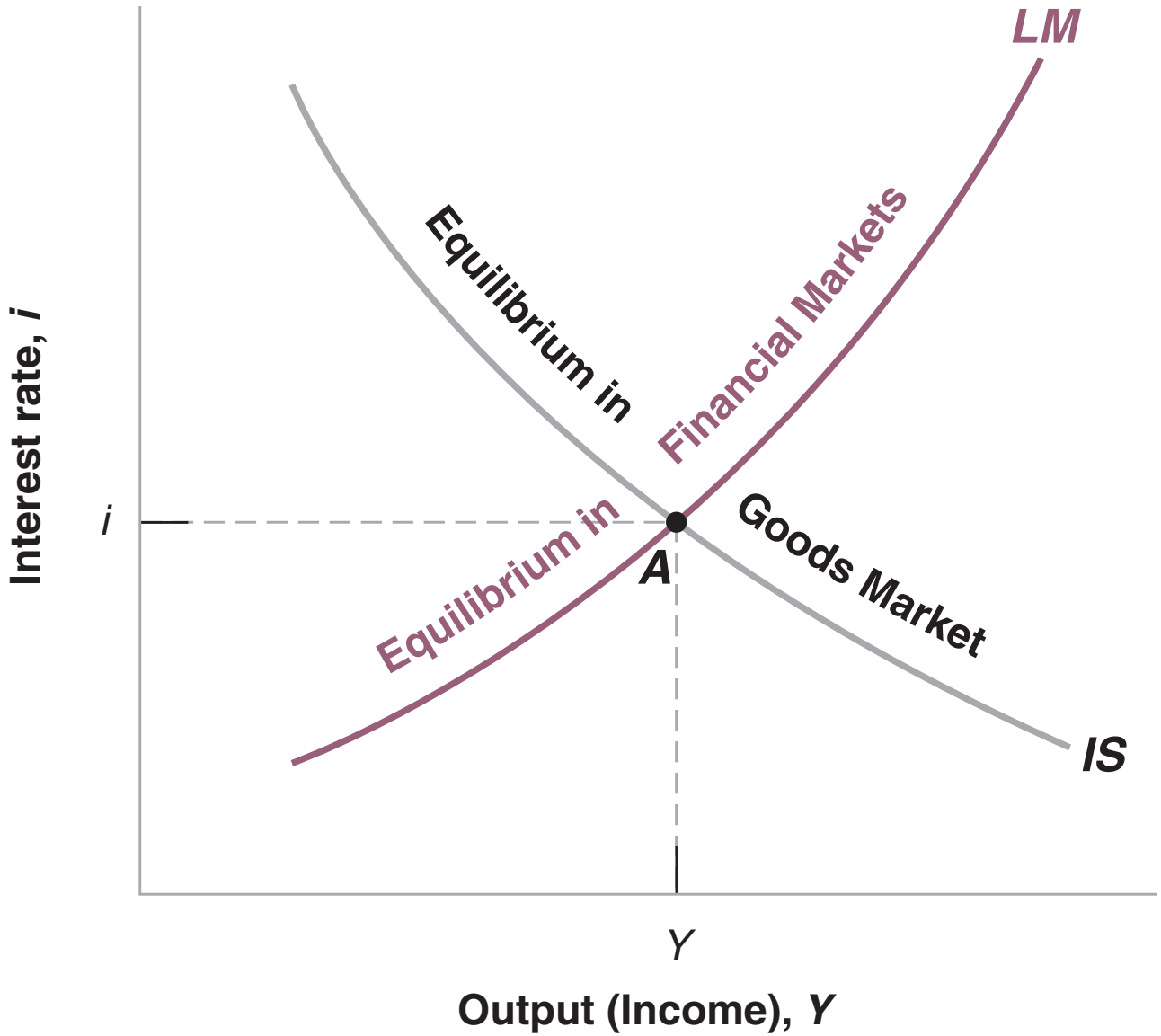
In this section you will learn how to

1. put IS and LM together and derive the equilibrium;
2. determine the effects of shocks and policies on equilibrium output and interest rate

Model Summary

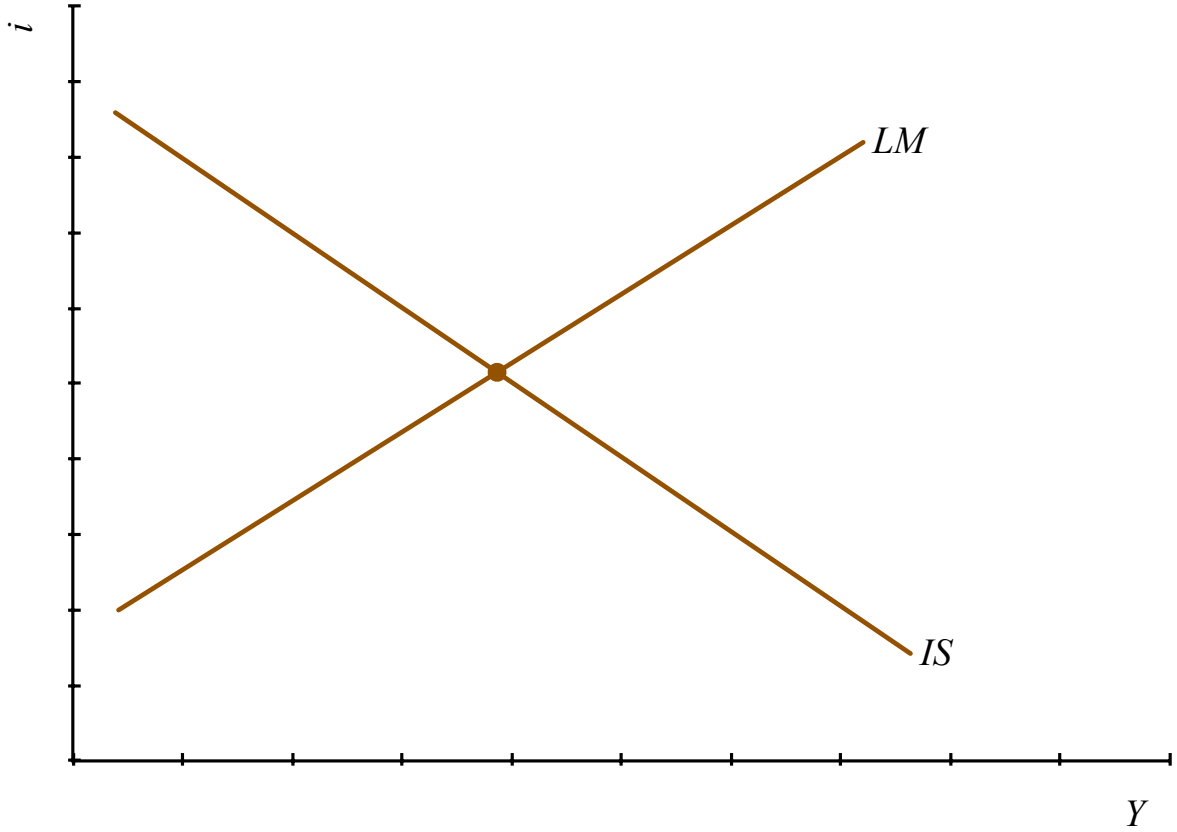
- Endogenous objects: Y, i
- Exogenous objects: $\bar{I}, c_0, G, T$
  - also M, which we take as controlled by CB for now
- Equations:
  - IS: $Y = C(Y - T) + I(Y, i) + G$
  - LM: $M/P = YL(i)$

IS-LM Graph


LM
Equilibrium in
Financial Markets
Interest rate, i
i
Equilibrium in
Goods Market
A
IS
Y
Output (Income), Y

Applications

Increasing Taxes



IS: $Y = C(Y - T) + I(Y, i) + G$

LM: $M/P = YL(i)$

The shock: $T \uparrow$

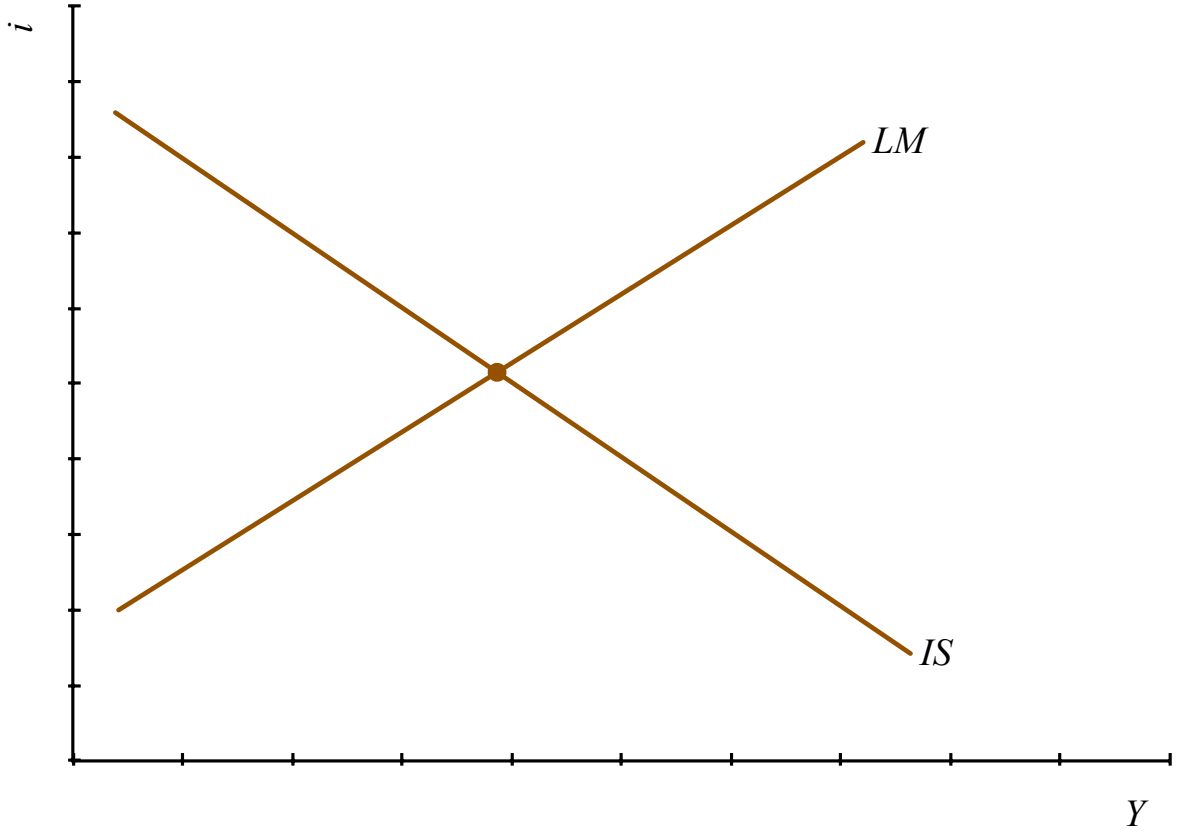
Taxes and Investment

- A common argument:
  - higher taxes reduce disposable income and saving
  - saving = investment
  - investment must fall
- Another common argument:
  - higher taxes reduce the government deficit
  - more money available for investment
- Which argument is right?

Increasing Taxes

What is missing in our analysis?

Monetary Expansion



IS: $Y = C(Y - T) + I(Y, i) + G$

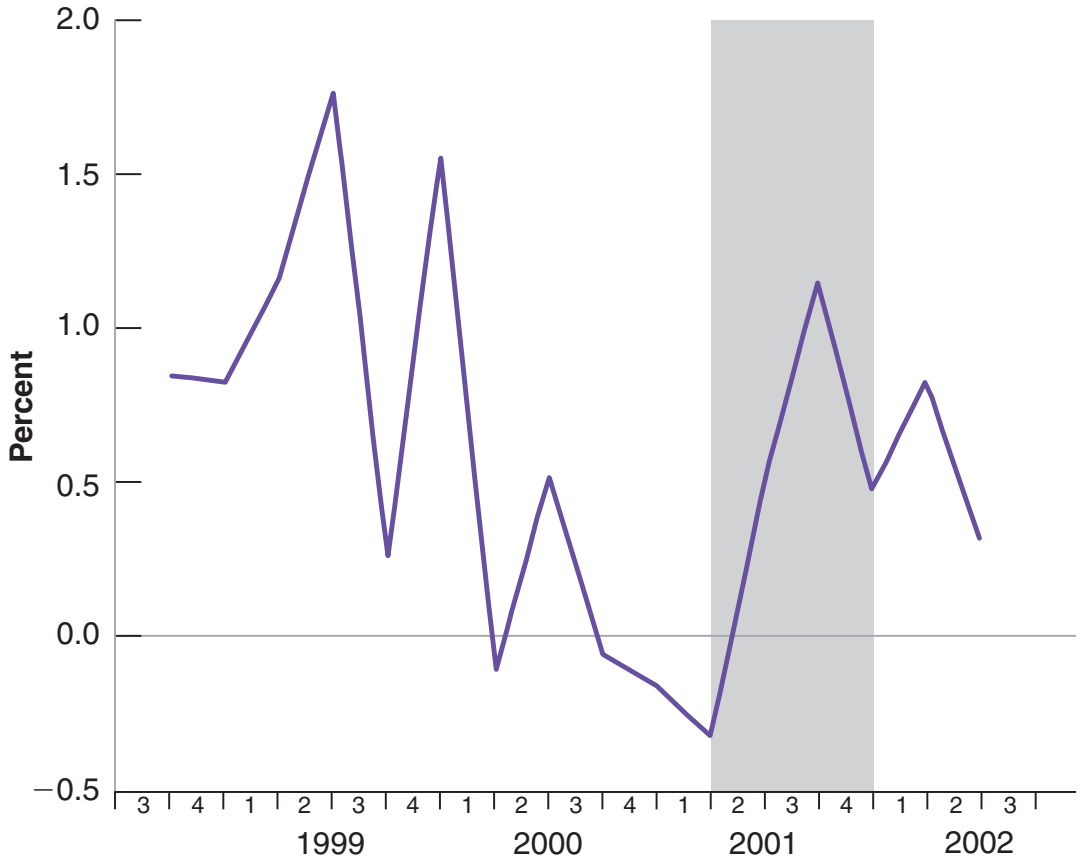
LM: $M/P = YL(i)$

The shock: $M \uparrow$

Policy Mix

- By combining monetary and fiscal policy, the government can, in principle, move Y and i independently.
- Monetary expansion: $Y \uparrow, i \downarrow$
- Fiscal expansion: $Y \uparrow, i \uparrow$
- Combination: $Y \uparrow, i$ unchanged
- In a typical recession, monetary and fiscal policies expand

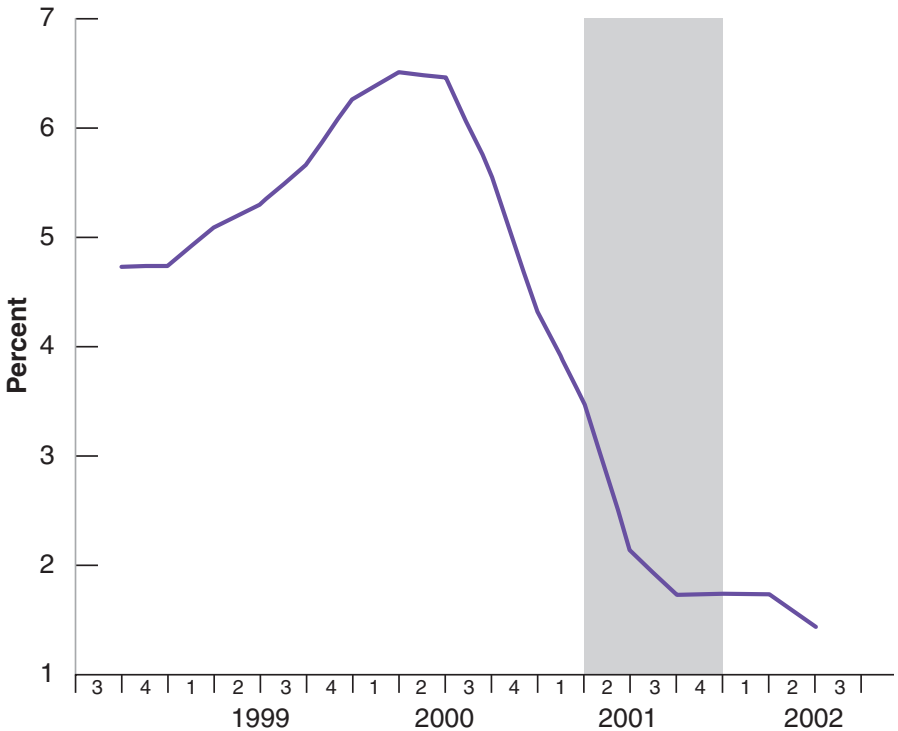
Example: 2001 Recession



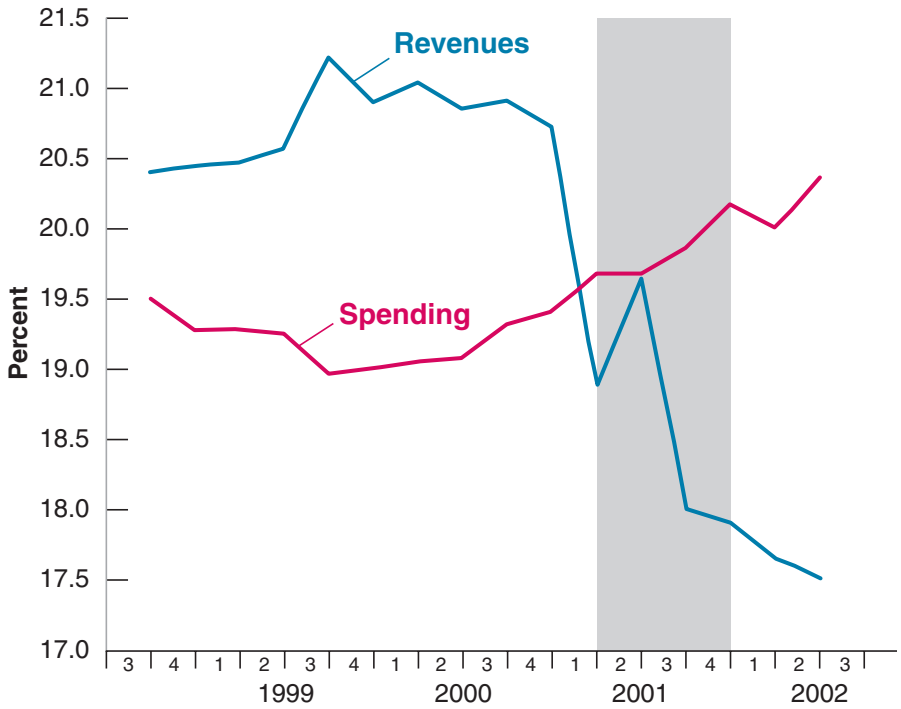
Growth rate of output

The shock: bursting of the tech bubble $\Longrightarrow I \downarrow$

Policy Responses

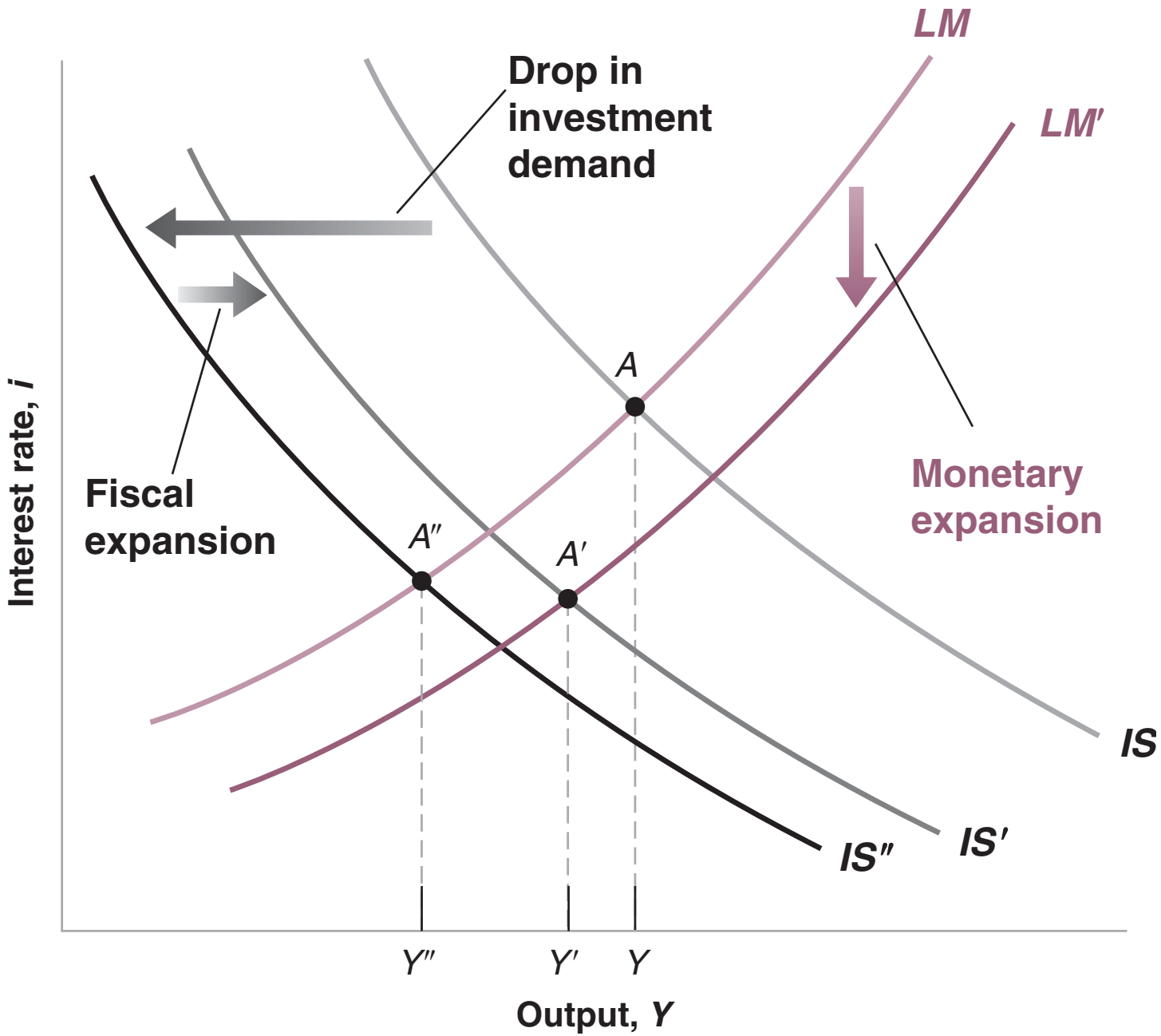


Federal funds rate



Government spending / revenue

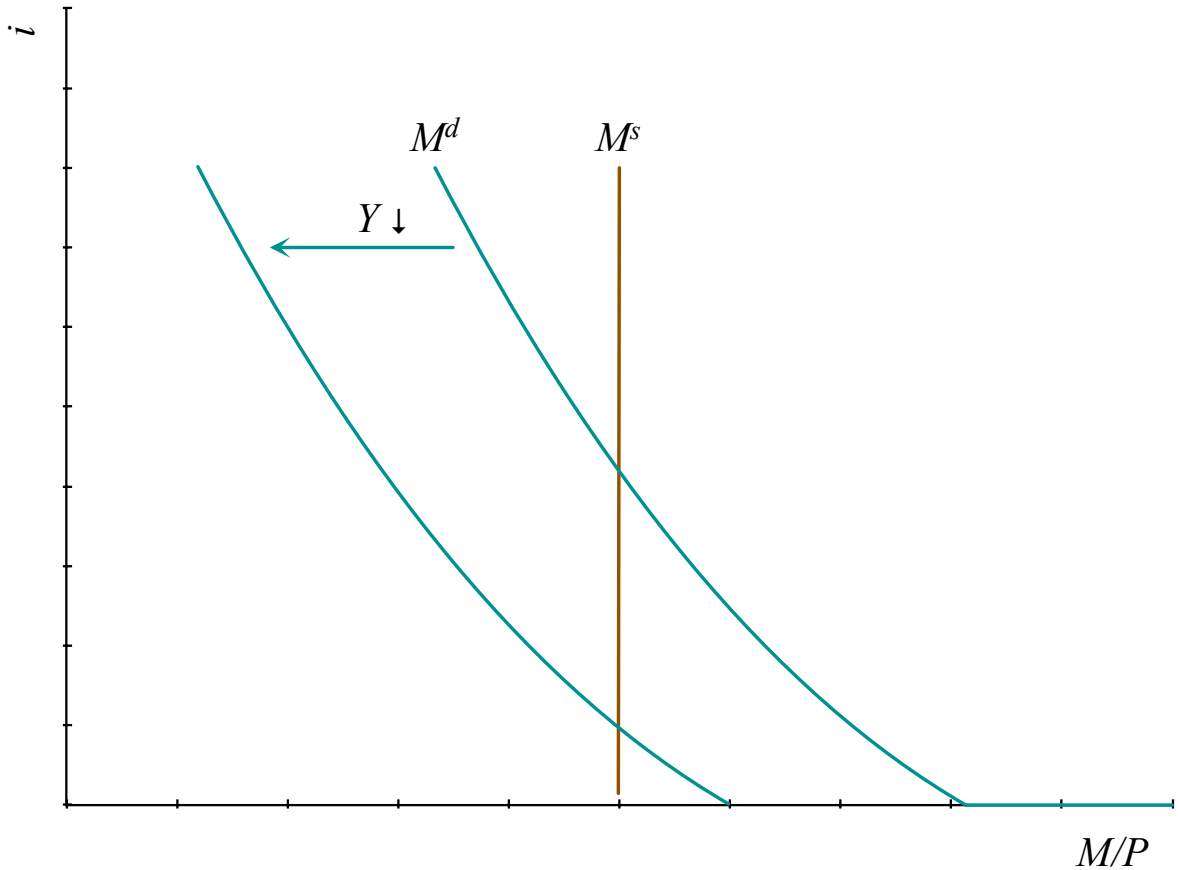
Analysis of the 2001 Recession



Liquidity Traps

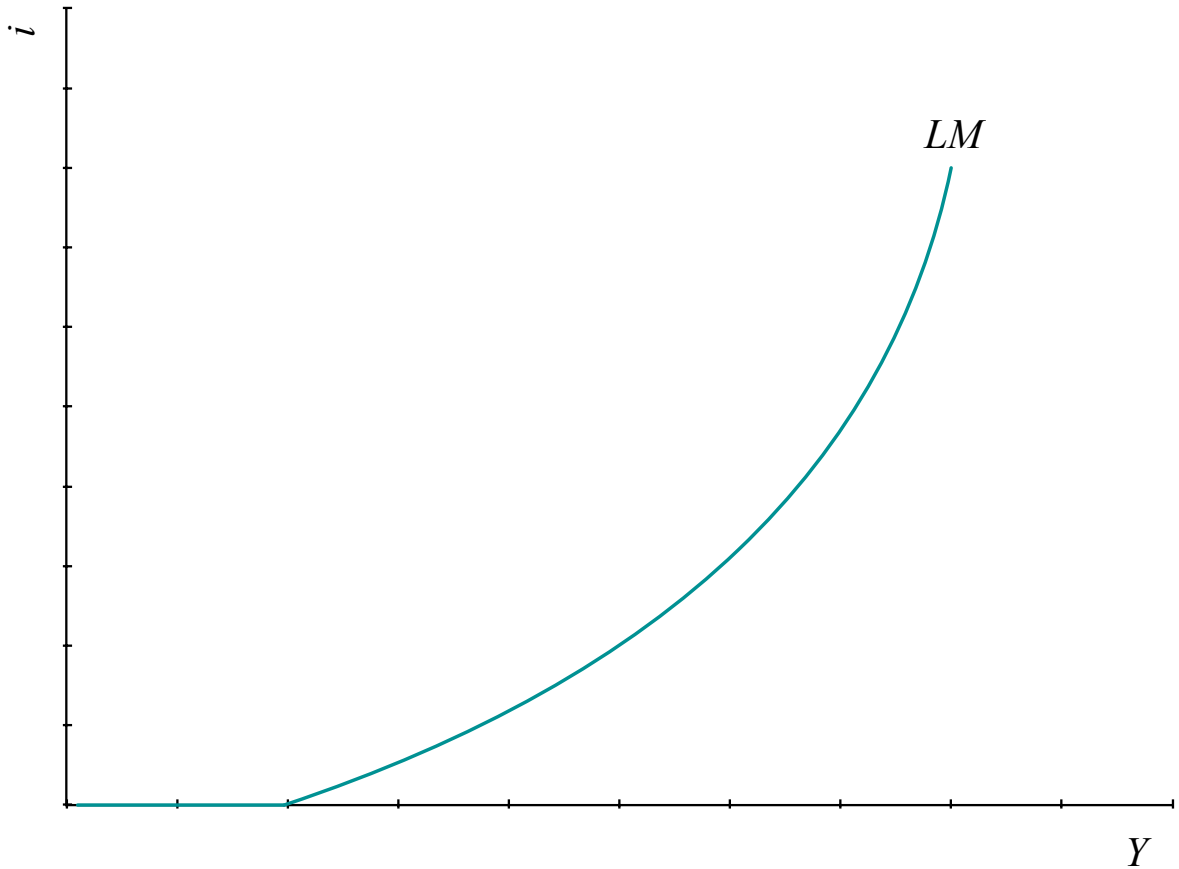
- Why do monetary policies have such a hard time pulling Japan out of recession?
- Real interest rates near zero
- Suggests flat LM curve
- "Liquidity trap"

Liquidity Trap



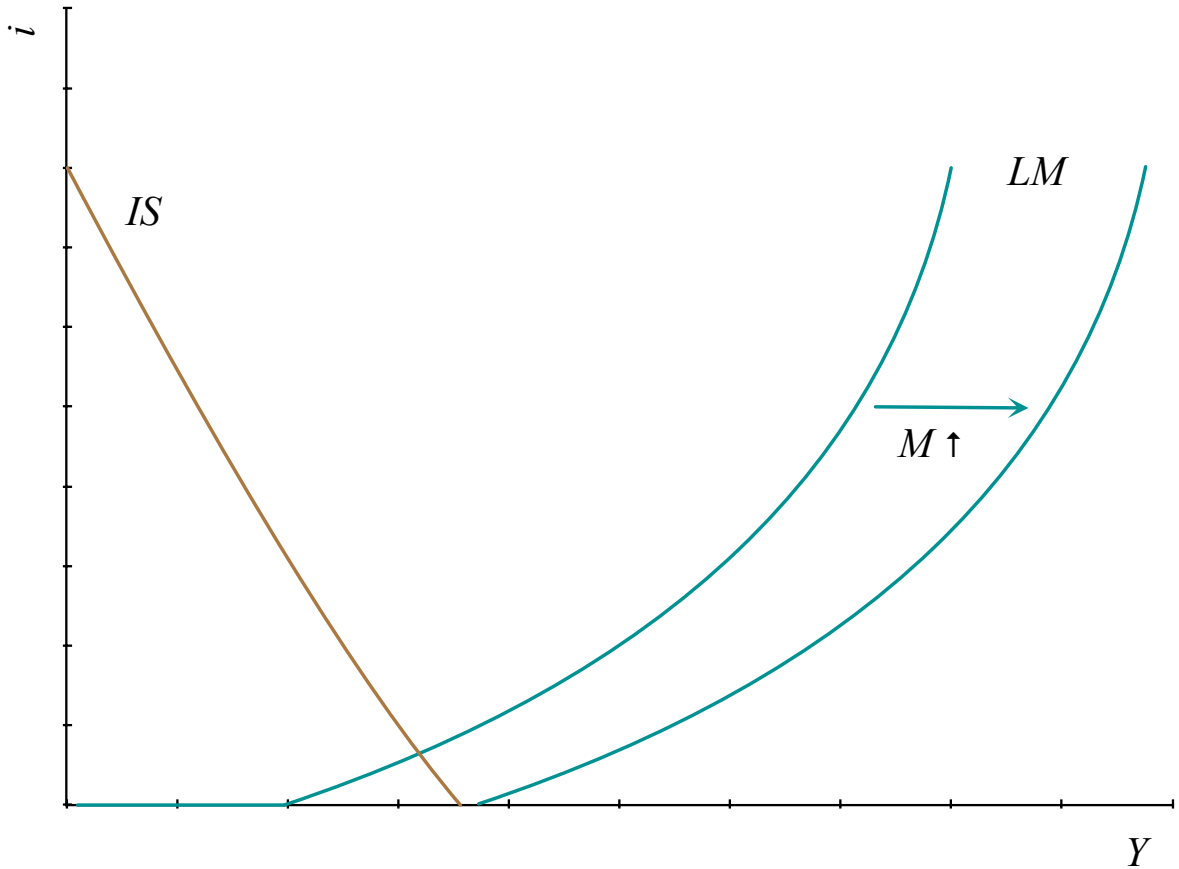
- The LM curve is derived by varying Y and tracing out $i, M/P$ points that clear the money market.
- For low Y the interest rate hits 0 and the LM curve becomes flat.

Liquidity Trap



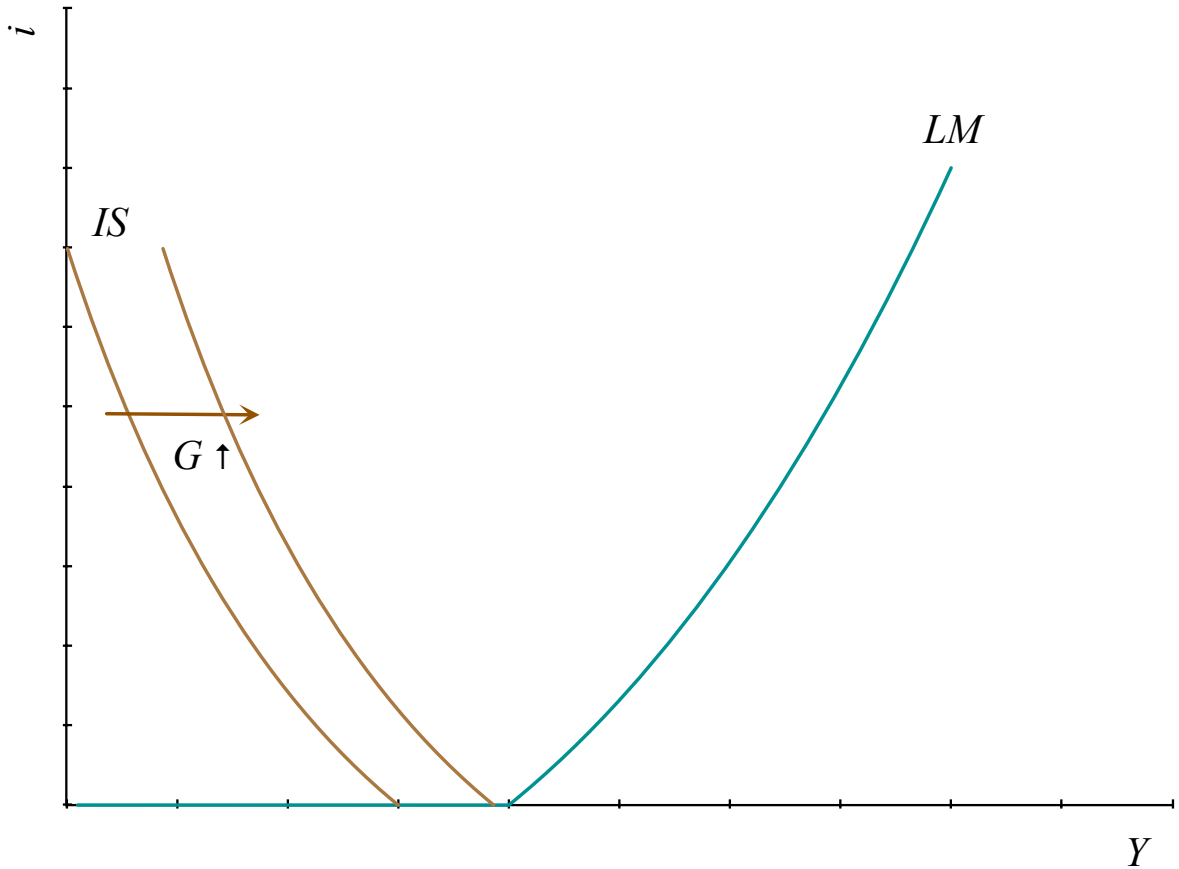
The LM curve is flat at 0 interest rates.

Liquidity Trap: Monetary Policy



Monetary policy becomes ineffective

Liquidity Trap: Fiscal Policy



Fiscal policy becomes highly effective

A Few Major Caveats

The IS-LM model makes the government look too powerful.

- By raising G it can achieve any level of Y.
- When is this a reasonable shortcut?

It looks like saving lowers output.

- What is missing?

Why Do We Still Have Recessions?

In the model, the government can stabilize output too easily.

Real world complications:

1. Big and variable lags until policies become effective
2. Lags in diagnosis and implementation of policies
3. Expansionary fiscal policies create debt
4. Expansionary monetary policies create inflation

An important point to remember

The IS-LM model makes strong assumptions: fixed prices, elastic supply, government can borrow without cost.

When applying the model, you need to consider how these assumptions modify the results.

(Or build a more comprehensive model)

Reading

- Blanchard / Johnson, Macroeconomics, 6th ed, ch. 5 and 9.2