UNIVERSITY OF CALIFORNIA
DEPARTMENT OF ECONOMICS

Economics 134
Spring 2018
Professor David Romer

LECTURE 4

REVIEW OF IS–LM/MP FRAMEWORK
JANUARY 29, 2018

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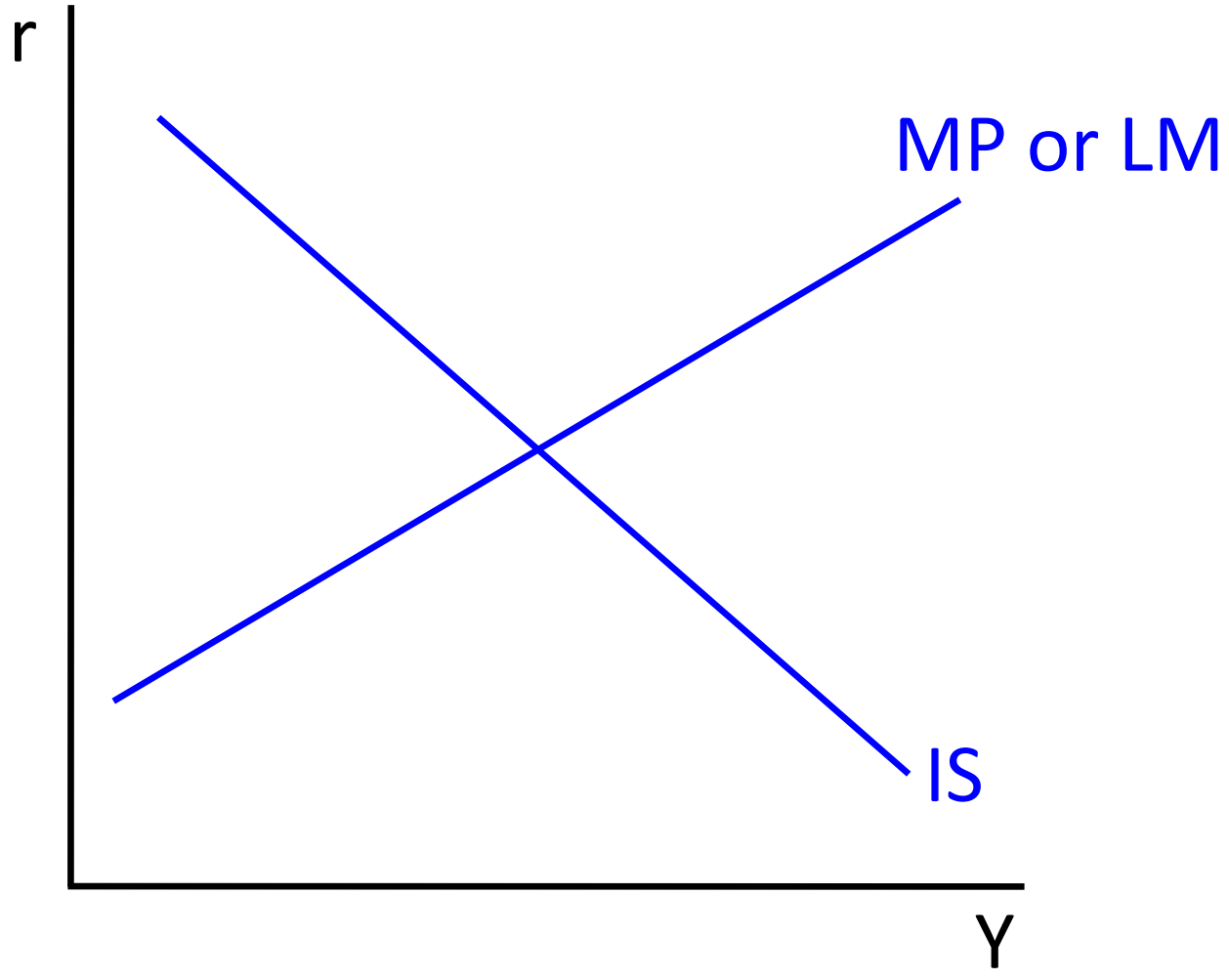
Housekeeping

- The reading for next time ("A Non-Technical Introduction to Regressions") is in the main course reader, after the "Short-Run Fluctuations" material.

- Reminder: The final exam is Monday, May 7, 3–6 P.M.

I. The IS–LM/MP Model

The IS–LM/MP Model: Where We Are Headed



Y is output; r is the real interest rate ($\equiv i - \pi^e$)

What Have You Seen in Previous Courses?

- IS plus an interest rate rule for monetary policy (IS–MP)?
- IS plus a curve describing equilibrium in the money market under the assumption that the central bank is targeting the money supply (IS–LM)?
- Both?
- Neither or don’t know?

A Key Assumption

- The starting point of the IS–LM/MP model: prices and wages are not completely flexible.
- In today's lecture, a stronger assumption: the price level and expected inflation are exogenous.
- A general comment about models and assumptions:
  - The purpose of a model is not to be "realistic."
  - It is to provide insights about particular features of the world.

The Equations of the IS Curve #1: Planned Expenditure and Output

$$E = Y$$

E is planned expenditure, Y is output.

The Equations of the IS Curve #2: Modeling Planned Expenditure

$$E = C(Y - T) + I(r) + G$$

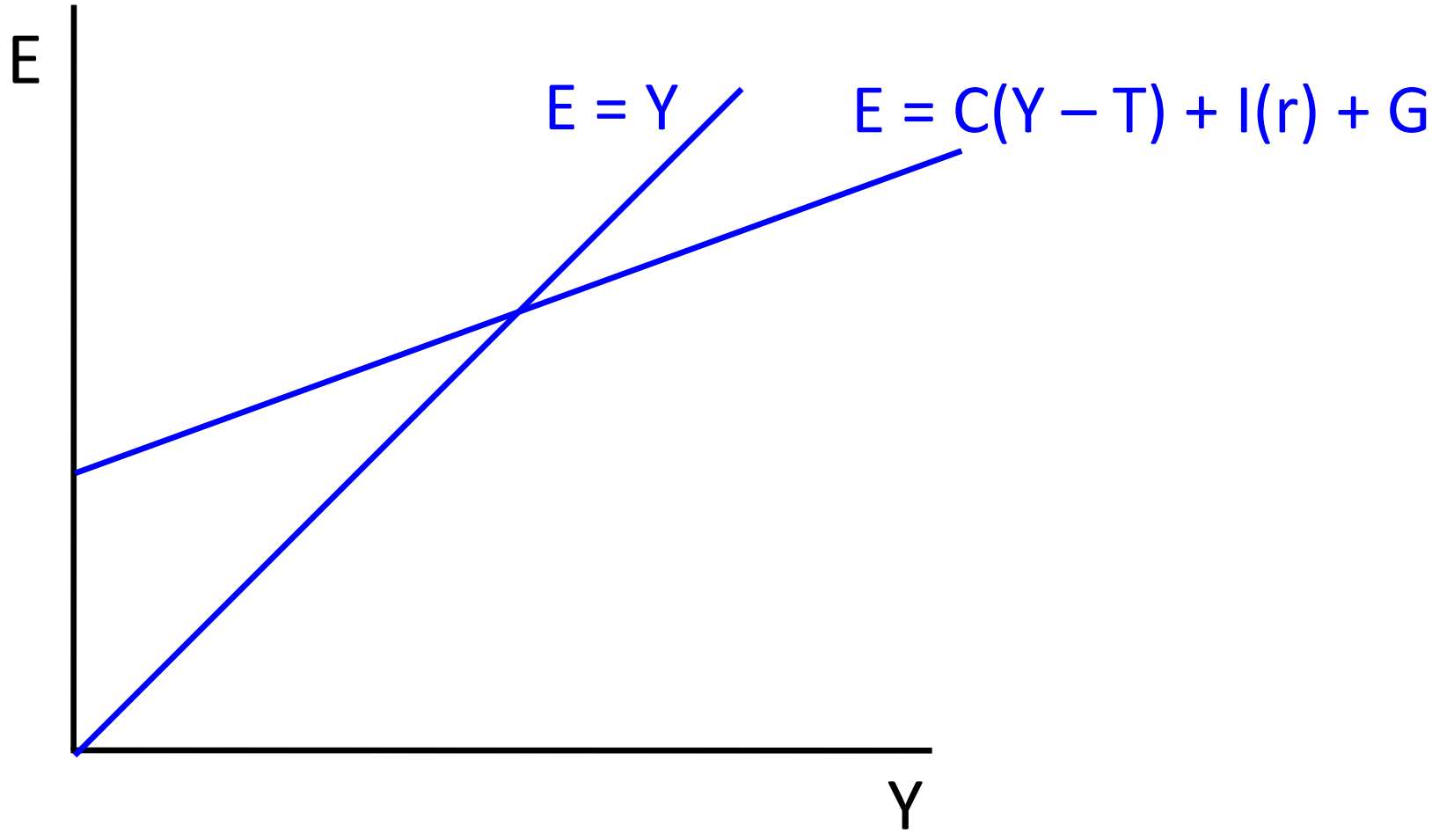
- T is taxes (net of transfers)
- G is government purchases
- C (Y – T) is a function giving consumption as a function of disposable income.
- I(r) is a function giving desired investment as a function of the real interest rate.

Assumptions about Planned Expenditure

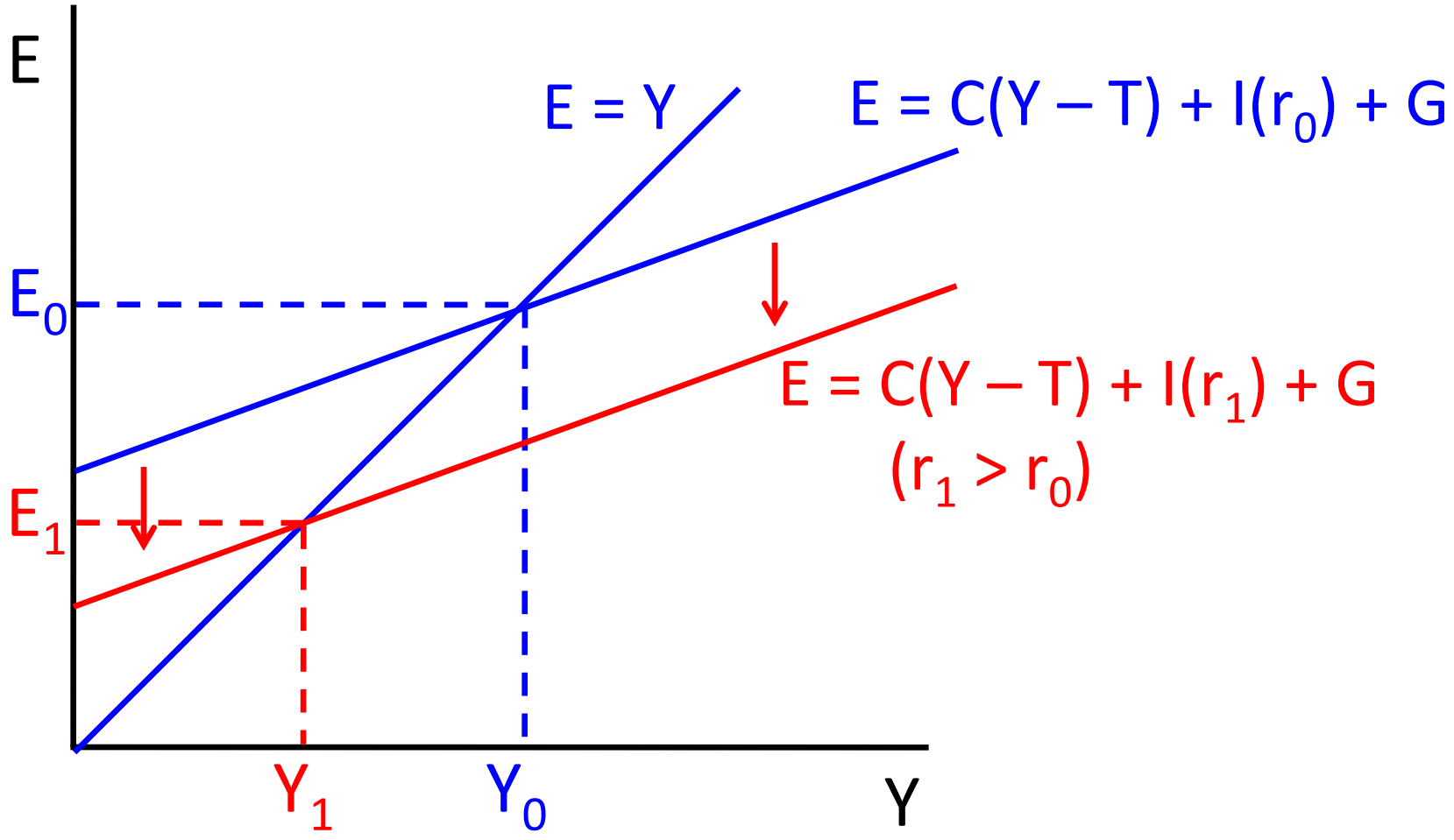
$$E = C(Y - T) + I(r) + G$$

- T is exogenous: $T = \bar{T}$.
- G is exogenous: $G = \bar{G}$.
- C(Y – T): When Y – T rises, consumption rises, but by less than the increase in Y – T.
- I(r): When r rises, desired investment falls.

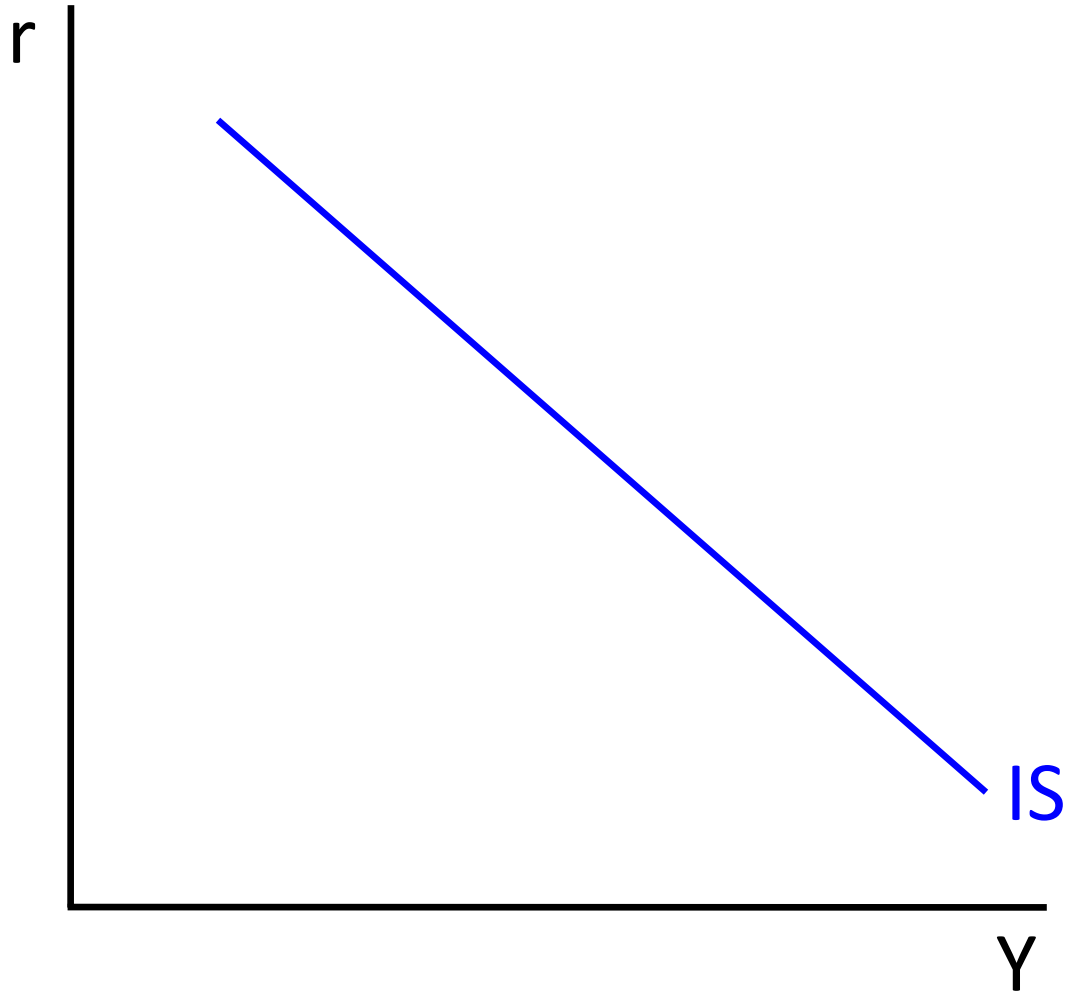
The Keynesian Cross



The Effects of a Rise in the Interest Rate in the Keynesian Cross



The IS Curve



One Approach to the Other Curve: An Interest Rate Rule and the MP Curve

An Interest Rate Rule

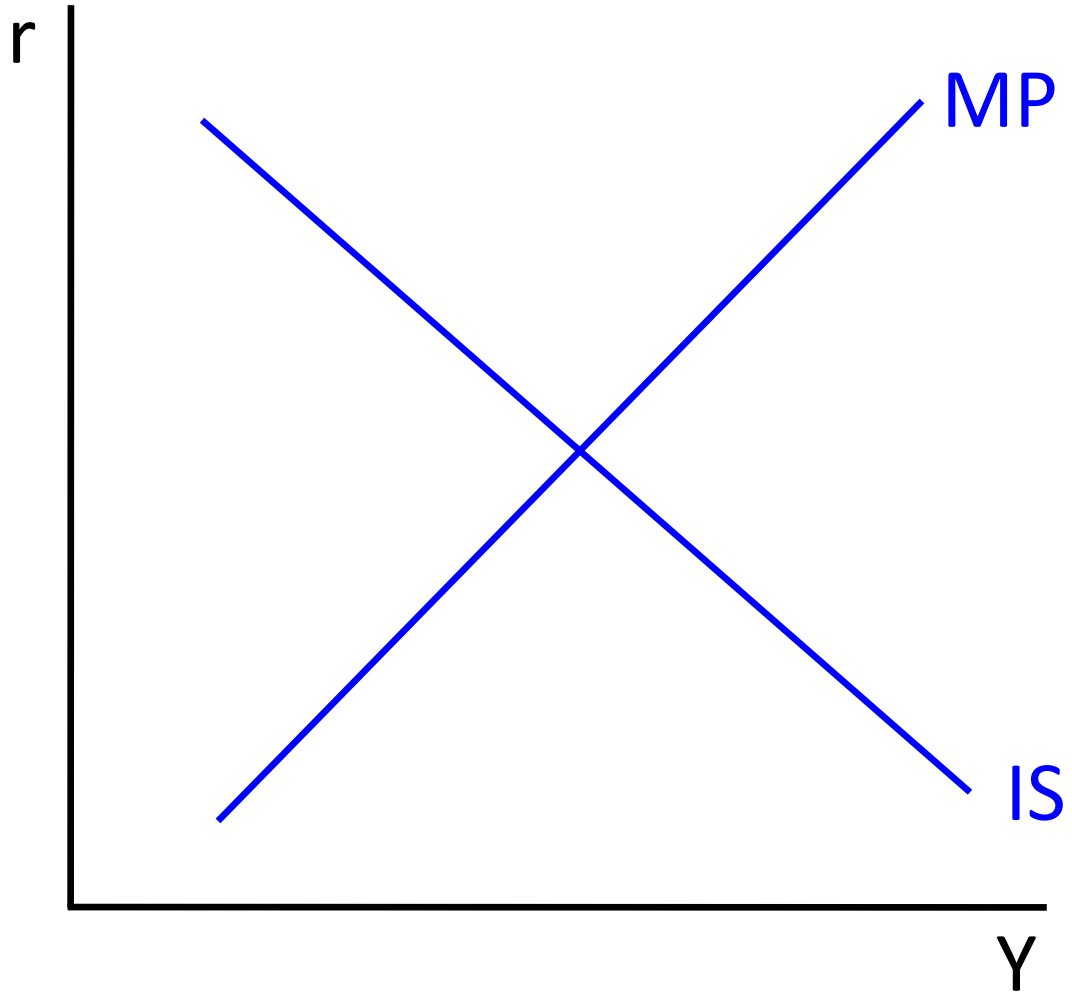
- When Y rises, the central bank raises r.
- When π rises, the central bank raises r.

So:

$$r = r(Y,\pi)$$

The real interest rate the central bank targets is an increasing function of both Y and π.

The MP Curve and the IS–MP Diagram



But How is the Central Bank Able to Control the Real Interest Rate?

By adjusting the money supply

- Unless all prices are completely and instantaneously flexible, an increase in the money supply lowers the real interest rate, and a decrease in the money supply raises the real interest rate.
- The central bank can change the money supply.
- Therefore, the central bank, by changing the money supply, can raise r when Y rises or π rises, and can lower r when Y falls or π falls.

The Other Approach to the Other Curve: The Money Market and the LM Curve

The Concept of Money We Will Focus On

High-powered money

- Controlled directly by the central bank.
- Pays no nominal interest (usually), so the opportunity cost of holding it is the nominal interest rate.

The Supply and Demand for Money

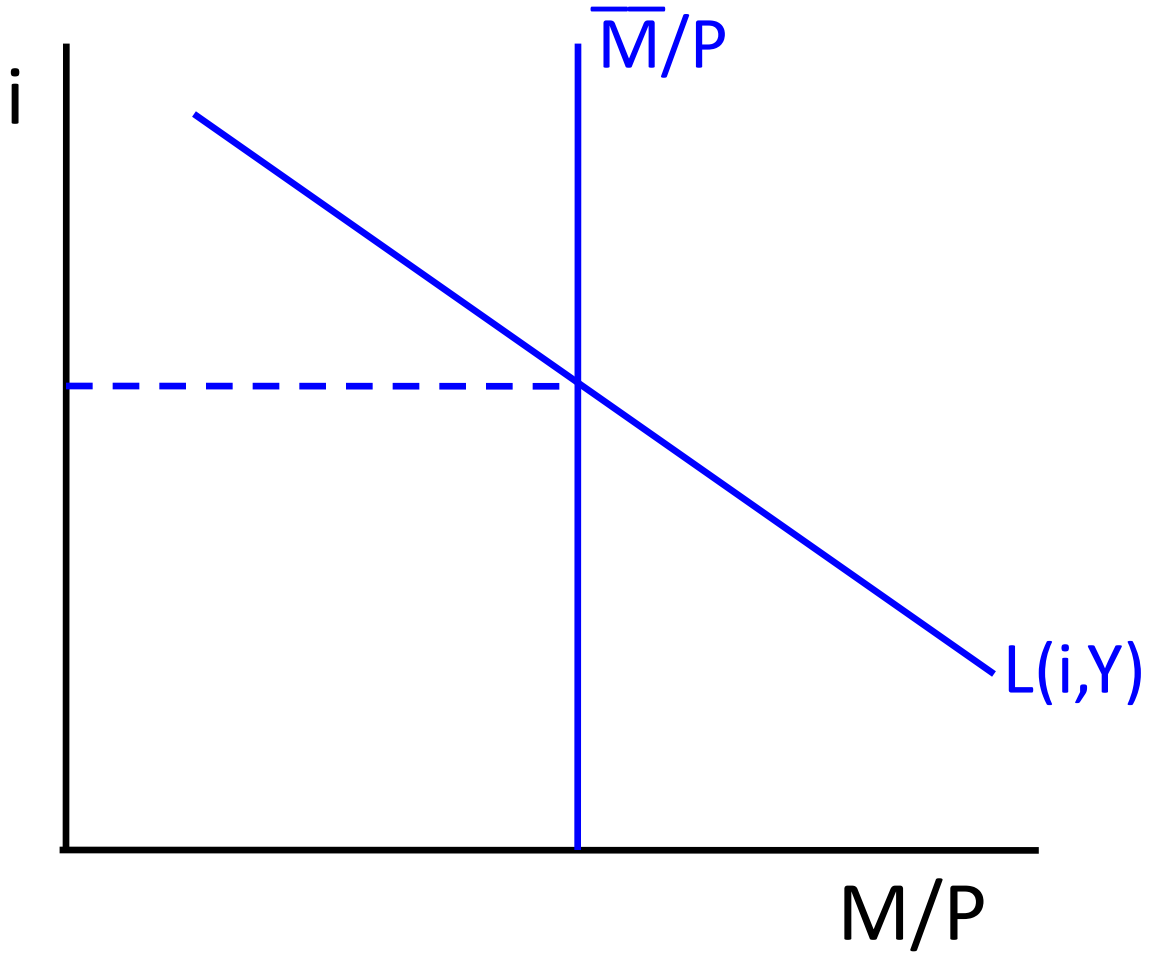
- Money supply: $M = \overline{M}$

- Demand for "real" money balances (M/P): L(i,Y)

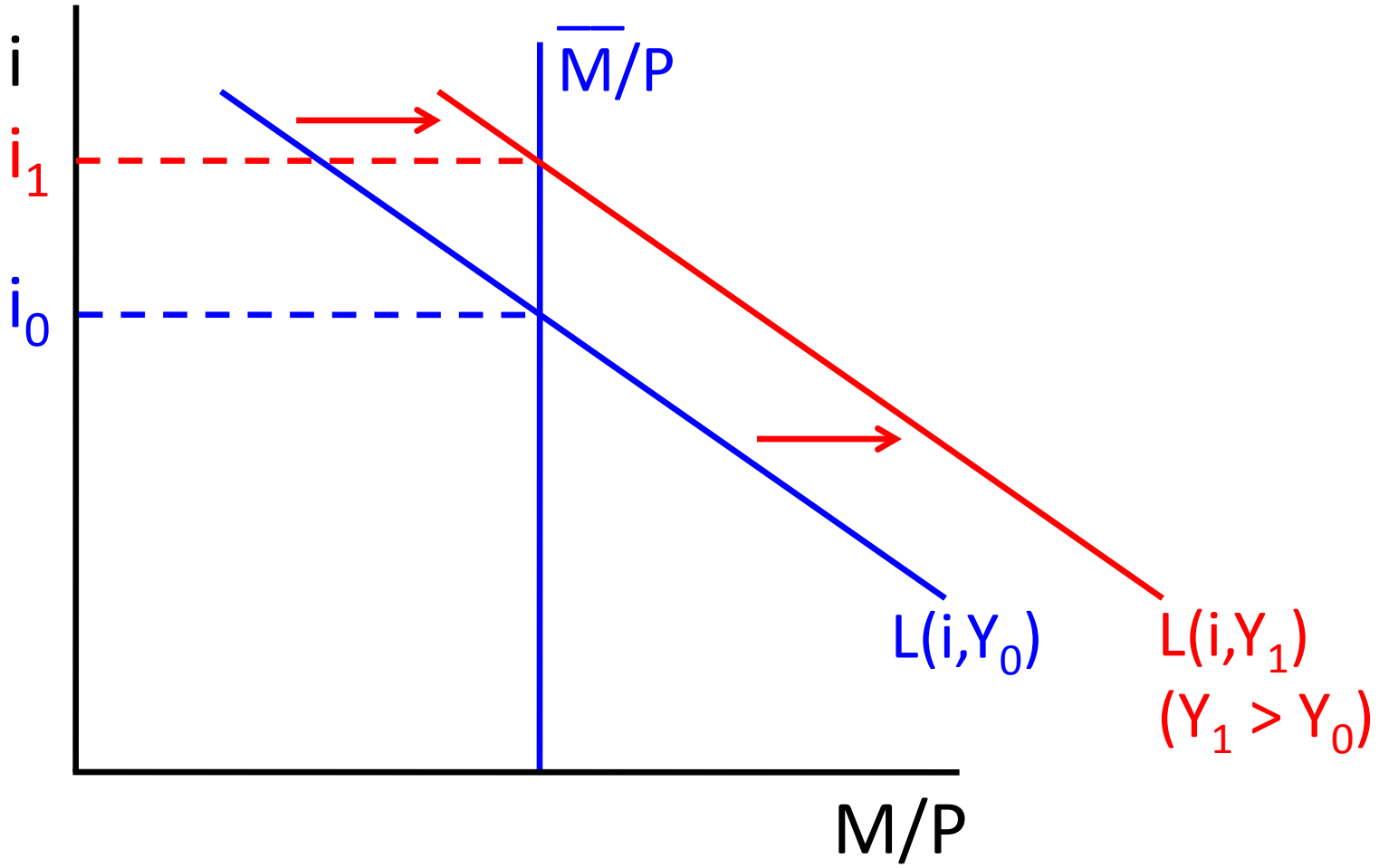
Money demand is an increasing function of output (Y), and a decreasing function of the nominal interest rate (i).

The Interest Rate for a Given Level of Output: The Money Market

$\overline{M}/P = L(i,Y)$

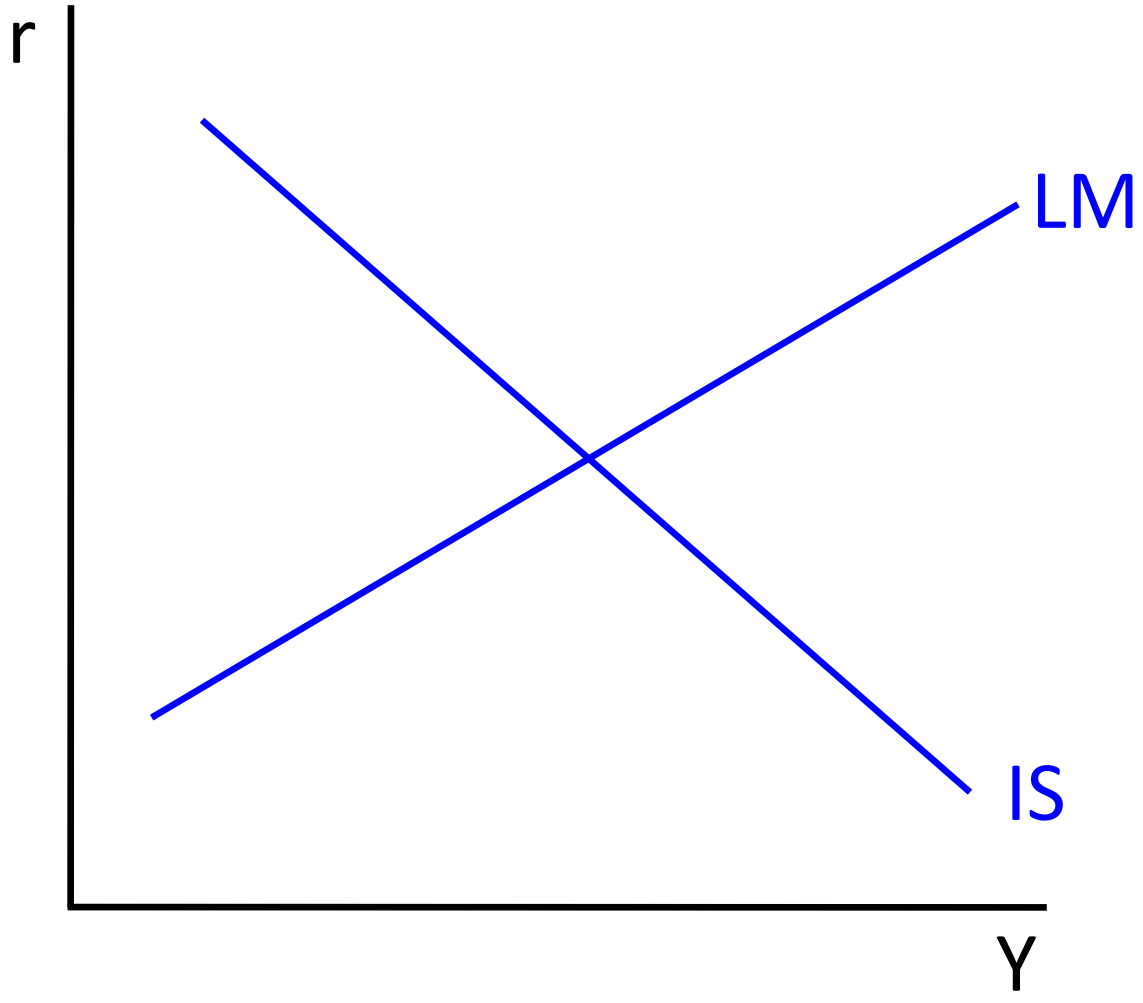


The Effects of a Rise in Output in the Money Market Diagram



Recall: $i = r + \pi^e$

The LM Curve and the IS–LM Diagram



MP or LM?

- Where the two models differ is in what they assume about how monetary policy is conducted.
- Thus, in deciding whether to use MP or LM, the key consideration is how monetary policy is conducted in the situation you are looking at.

MP or LM? Examples

- The effects of any development in the United States in the 1990s. MP
- The central bank is targeting the money supply, and decides to raise its target. LM
- The Island of Yap. LM

II. EXAMPLES

Example: A Fall in Investment Demand

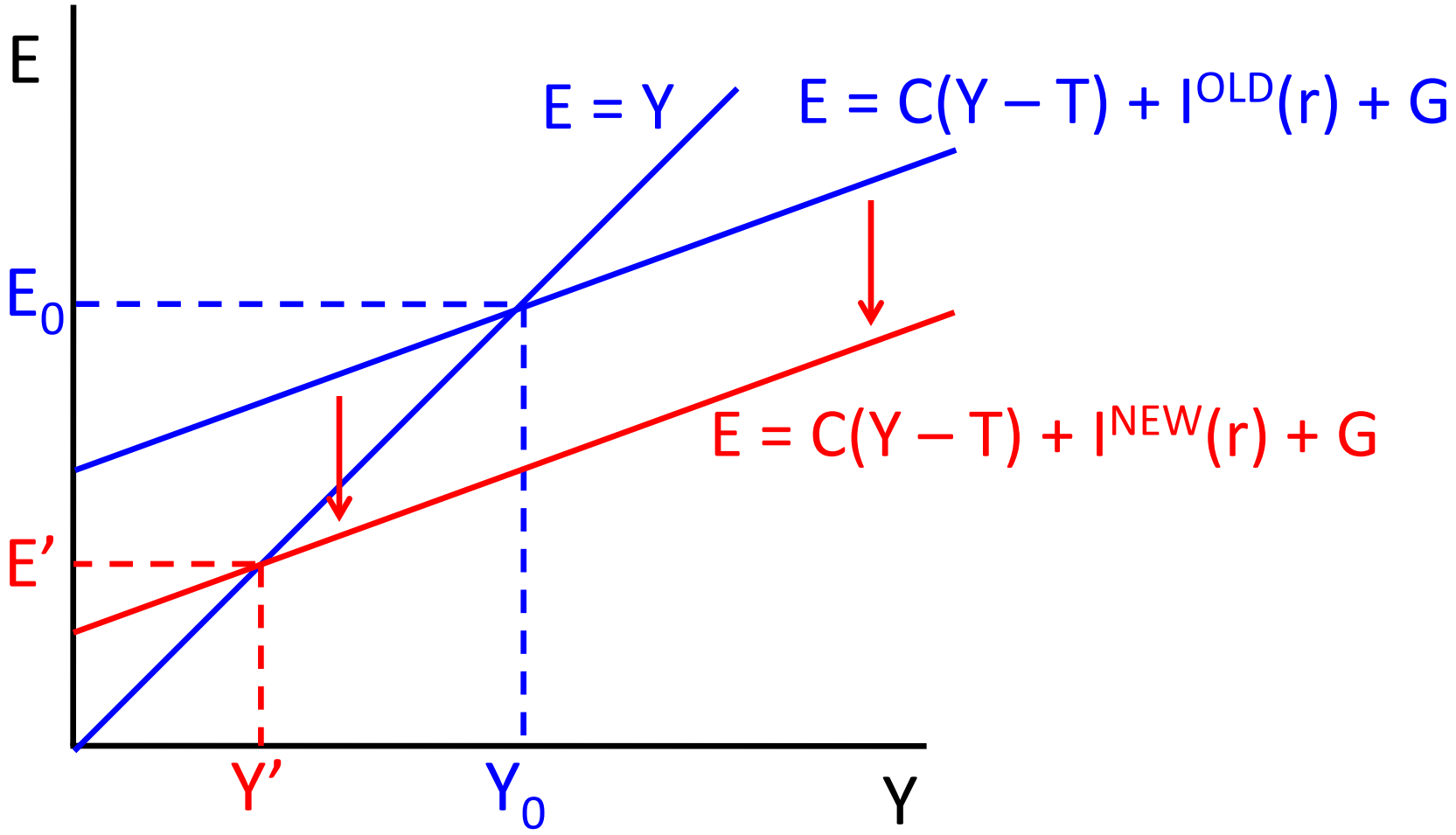
The development we want to analyze: In 2000 and 2001, firms realized that high-tech investment goods, such as fiber-optic cable, were not going to have as large payoffs as they had thought.

Corresponds to a shift of the I(r) function: I at a given r is lower.

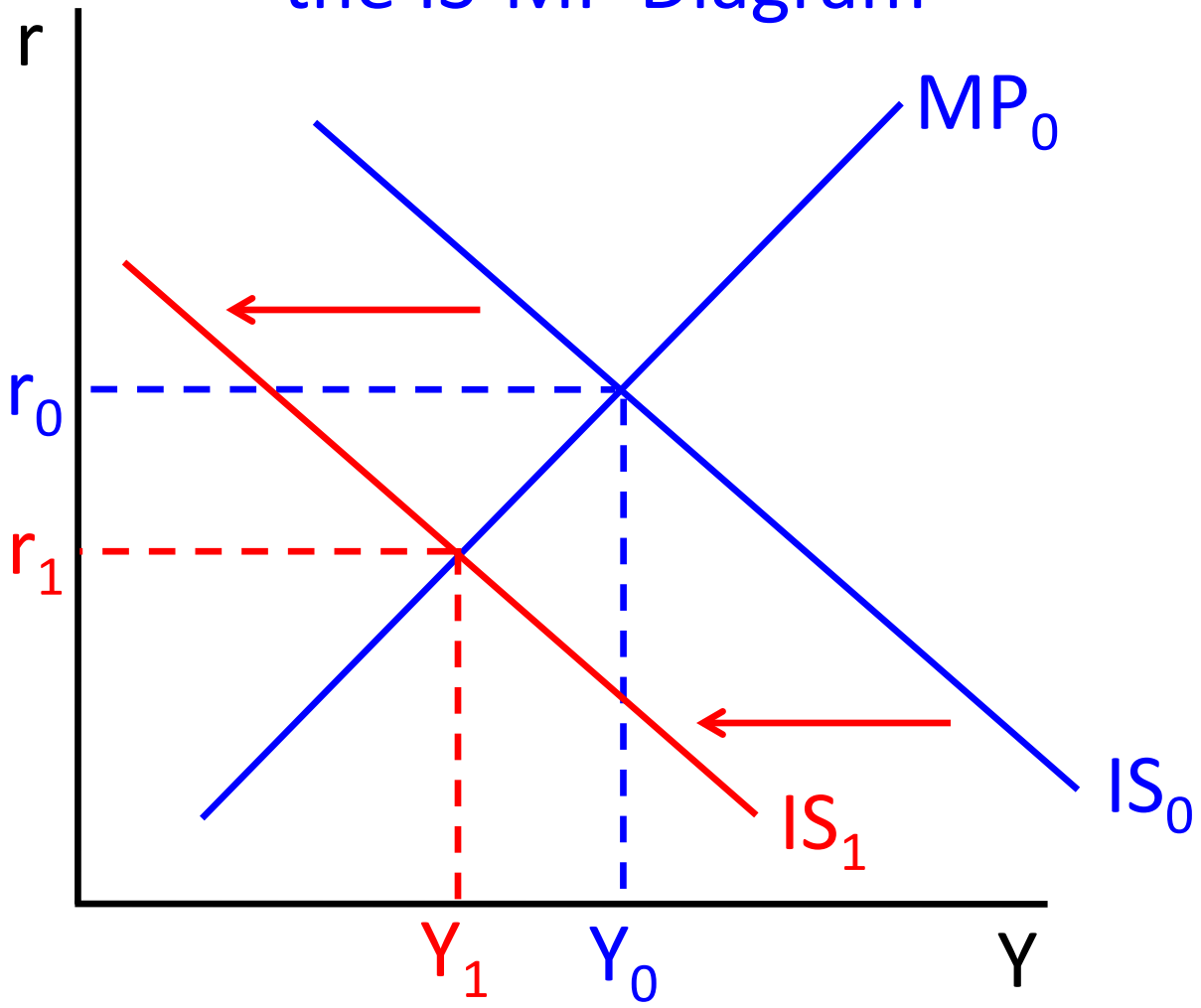
MP or LM?

MP

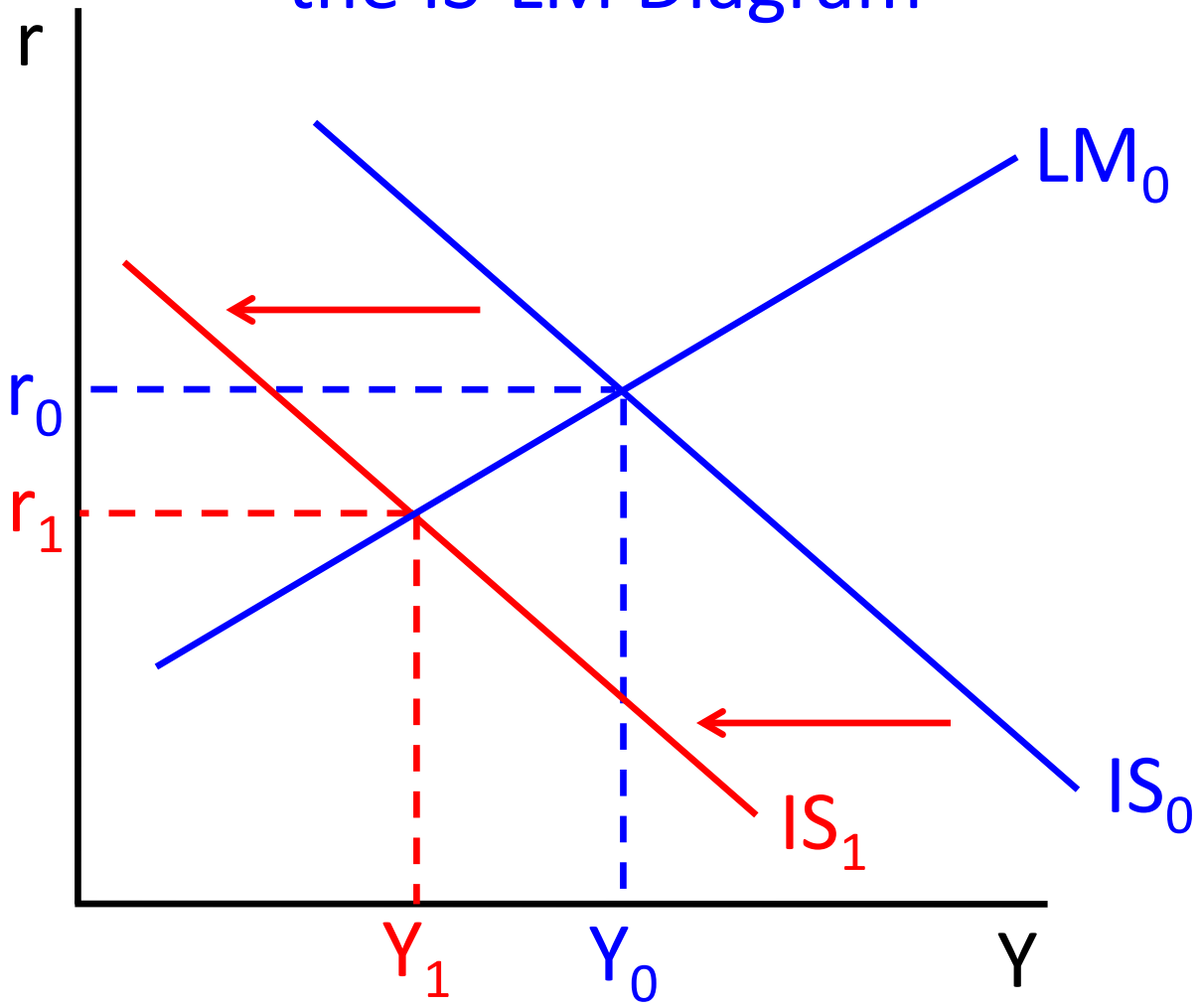
The Effects of a Fall in Investment Demand in the Keynesian Cross



The Effects of a Fall in Investment Demand in the IS-MP Diagram



The Effects of a Fall in Investment Demand in the IS-LM Diagram



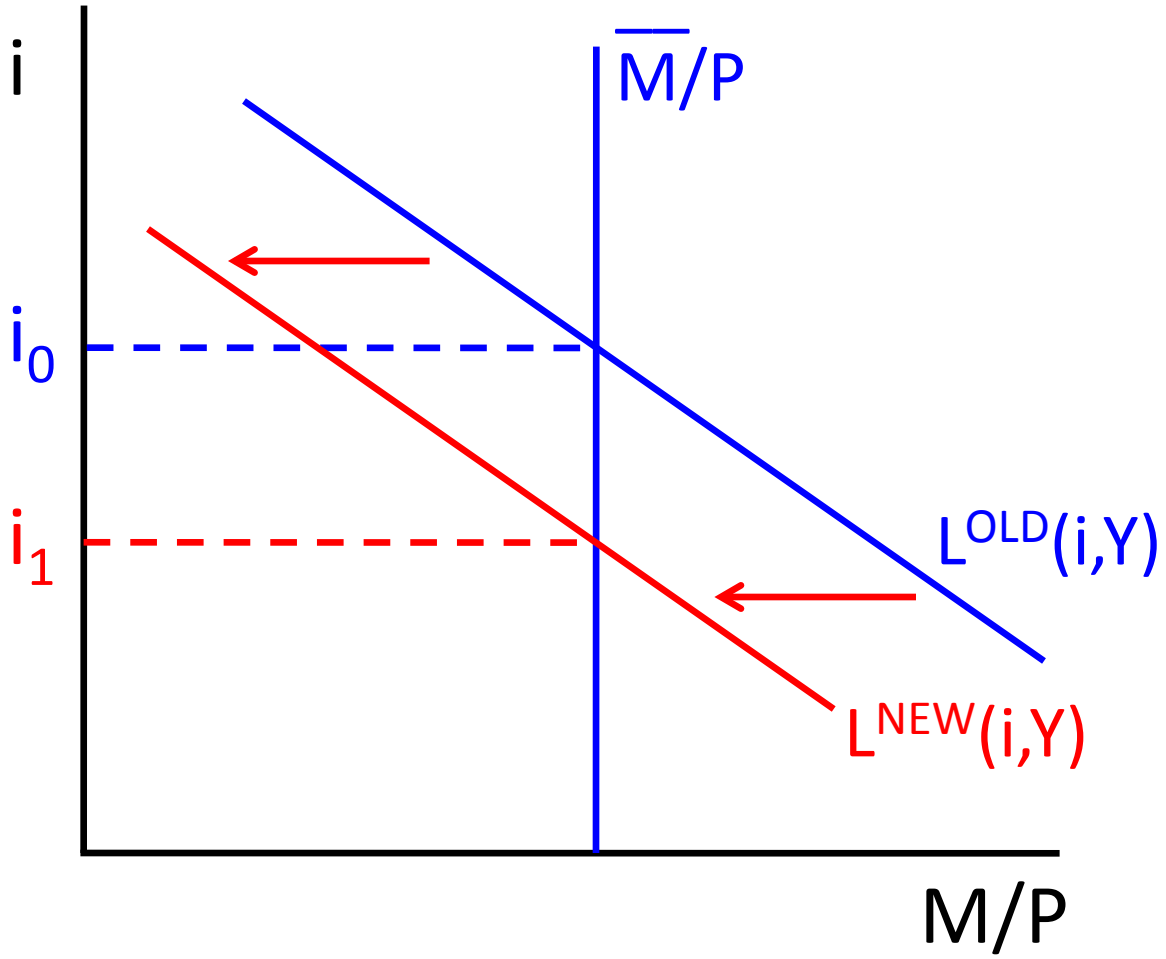
Example: Financial Innovation

The development we want to analyze:
New technologies allow people to make many purchases using debit cards that they used to have to make using cash.

Corresponds to a shift of the L(i,Y) function: money demand at a given i and Y is lower.

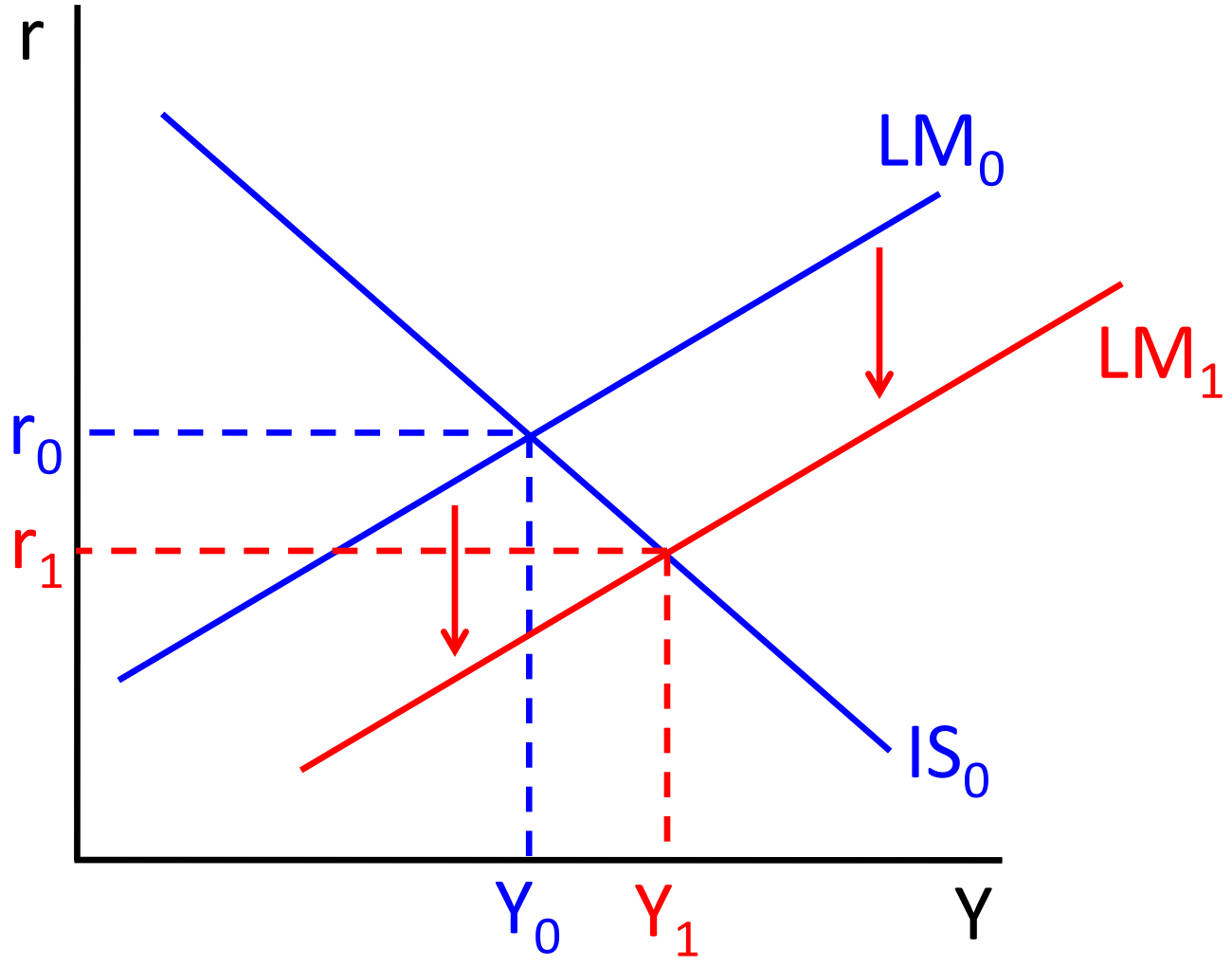
If the Central Bank Keeps the Money Supply Fixed

Step 1: The Effect on the Money Market at a Given Y?



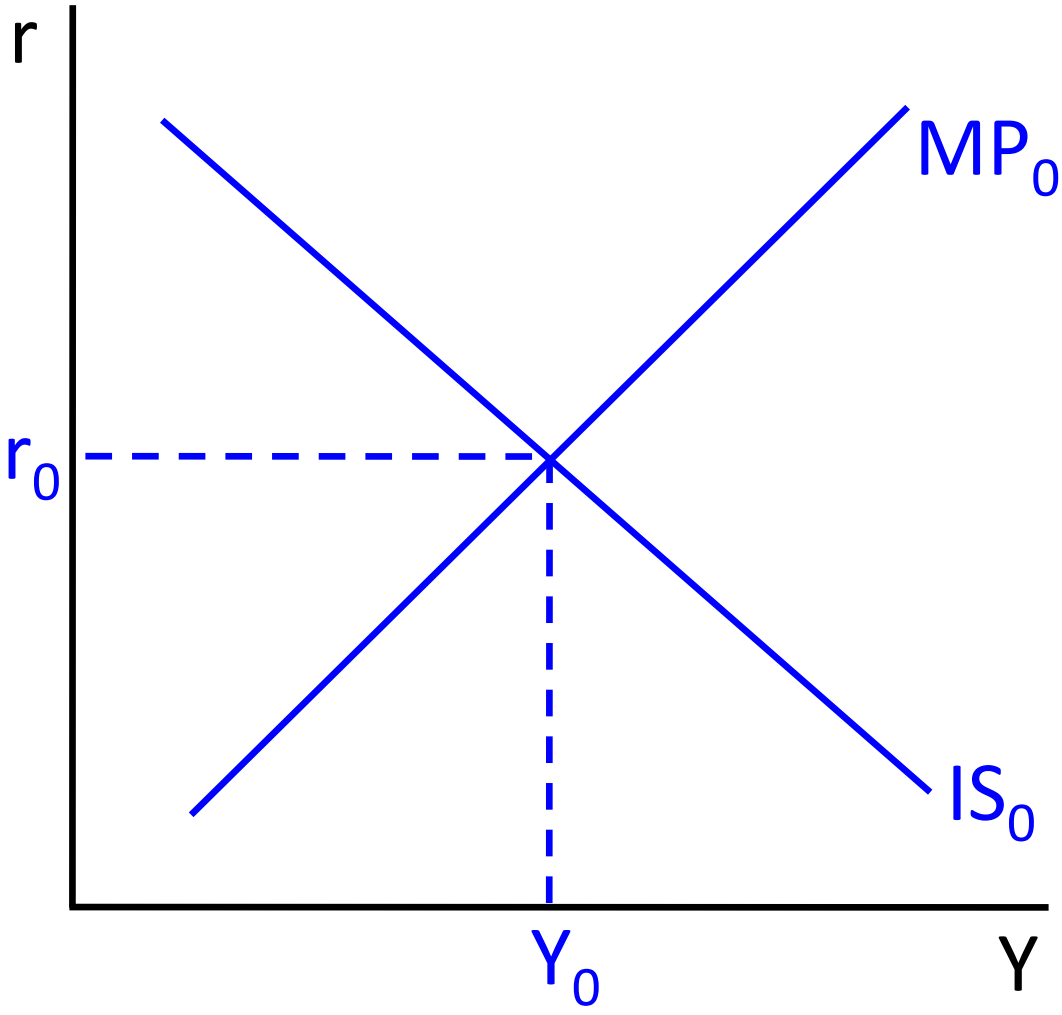
If the Central Bank Keeps the Money Supply Fixed

Step 2: The Effect on the IS and/or LM Curves?



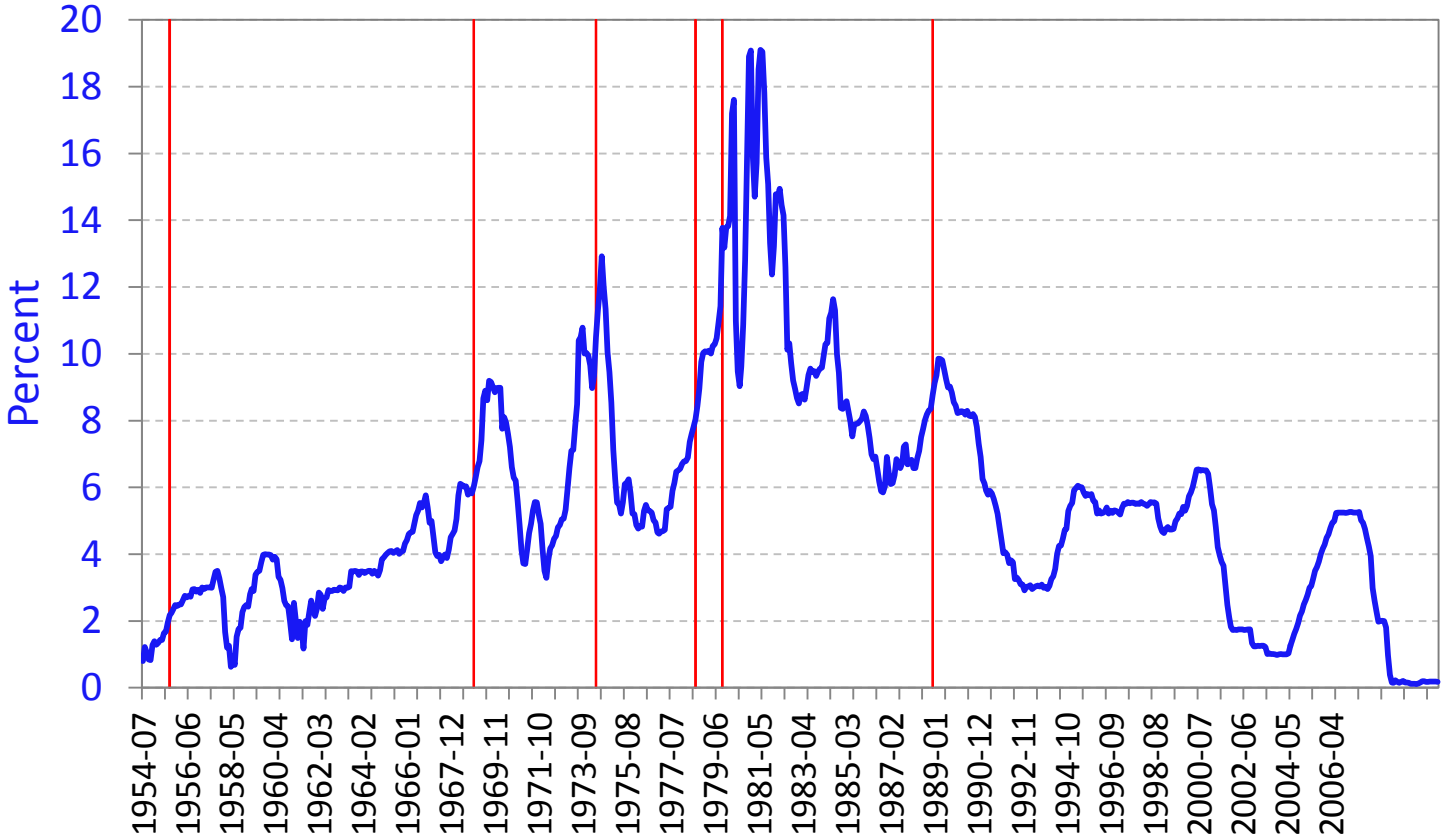
If the Central Bank Is Following an Interest Rate Rule

The Effect on the IS and/or MP Curves?



Neither curve changes.

Federal Funds Rate
1954:7-2007:12



Interest rates were very volatile in the period when the Fed was – to some extent – targeting the money supply.