UNIVERSITY OF CALIFORNIA
DEPARTMENT OF ECONOMICS

Economics 134
Spring 2018
Professor David Romer

LECTURE 22

EXPANDING THE IS-MP FRAMEWORK TO INCLUDE FINANCIAL CRISES

APRIL 16, 2018

I. Extending the IS-MP Model

A. Introduction
B. Assumptions
   1. The saving real interest rate and the borrowing real interest rate
   2. How the two interest rates enter the model
   3. The determination of the interest rate differential
   4. The rest of the model
   5. Two comments
C. Analyzing the Model
   1. How introducing an interest rate differential affects the planned expenditure line
   2. How introducing an interest rate differential affects the IS curve
   3. Another way of showing how introducing an interest rate differential affects the IS curve
   4. The rest of the model: AD-IA revisited

II. Applications

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   1. The effects on output and on the saving interest rate
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   1. Modeling a financial market disruption
   2. The effects on the Keynesian cross
   3. The effects on output and on the saving interest rate
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   2. Possible implications for monetary policy

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B. Modeling the Macroeconomic Effects of a Financial Crisis
C. Sources of Financial Crises
   1. Why financial institutions are inherently vulnerable: debt and "maturity mismatch"
   2. Origins of financial stress
   3. Magnification of financial stress: contagion

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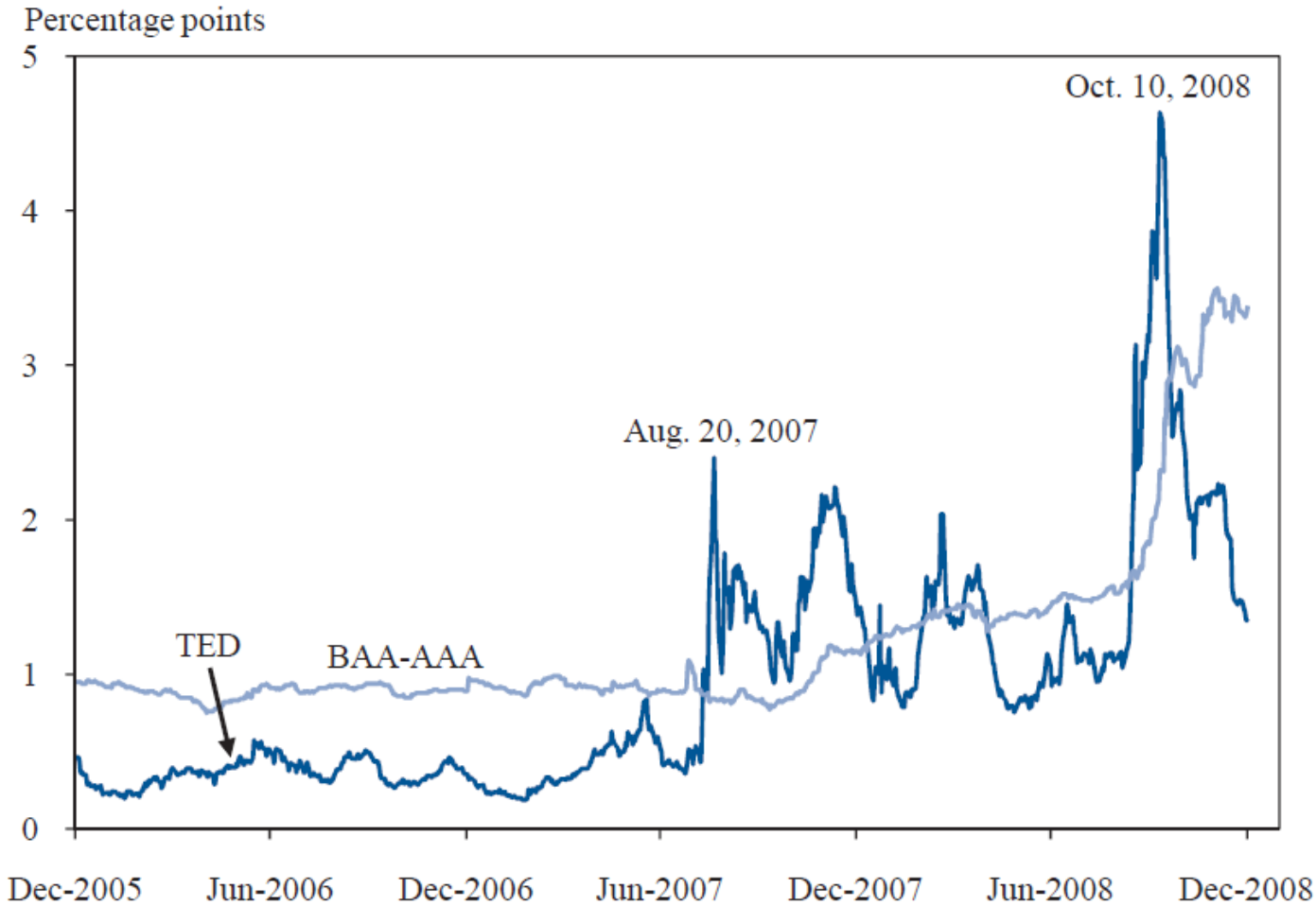
Announcements

- Turn in your essays.
  - Also upload a pdf version on the class bCourses website (not the main course website). The file name should be Firstname_Lastname_Topic#.pdf (for example, Carol_Christ_Topic2.pdf).
- Problem Set 4 is being distributed.
  - It is due at the ***beginning*** of lecture on Monday, April 23.
  - Optional problem set work session: Thursday, April 19, ***5–7***, in ***597*** Evans Hall.

I. Extending the IS-MP Model

Figure 2-3
TED Spread and Moody's BAA-AAA Spread Through December 2008



TED spread spiked in August 2007 and again in September and October 2008.

Assumptions (I)

- 2 real interest rates:
  - The saving real interest rate, r^s.
  - The borrowing real interest rate, r^b.
- The central bank's interest rate rule is for the saving interest rate: $r^s = r^s(Y,\pi)$.
- The demand for goods depends on the borrowing interest rate: $E = C(Y - T) + I(r^b) + G$.

Assumptions (II)

- The interest rate differential, r^b - r^s, is always positive, and is a decreasing function of output:

  $r^b - r^s = d(Y)$. When Y rises, the differential falls.

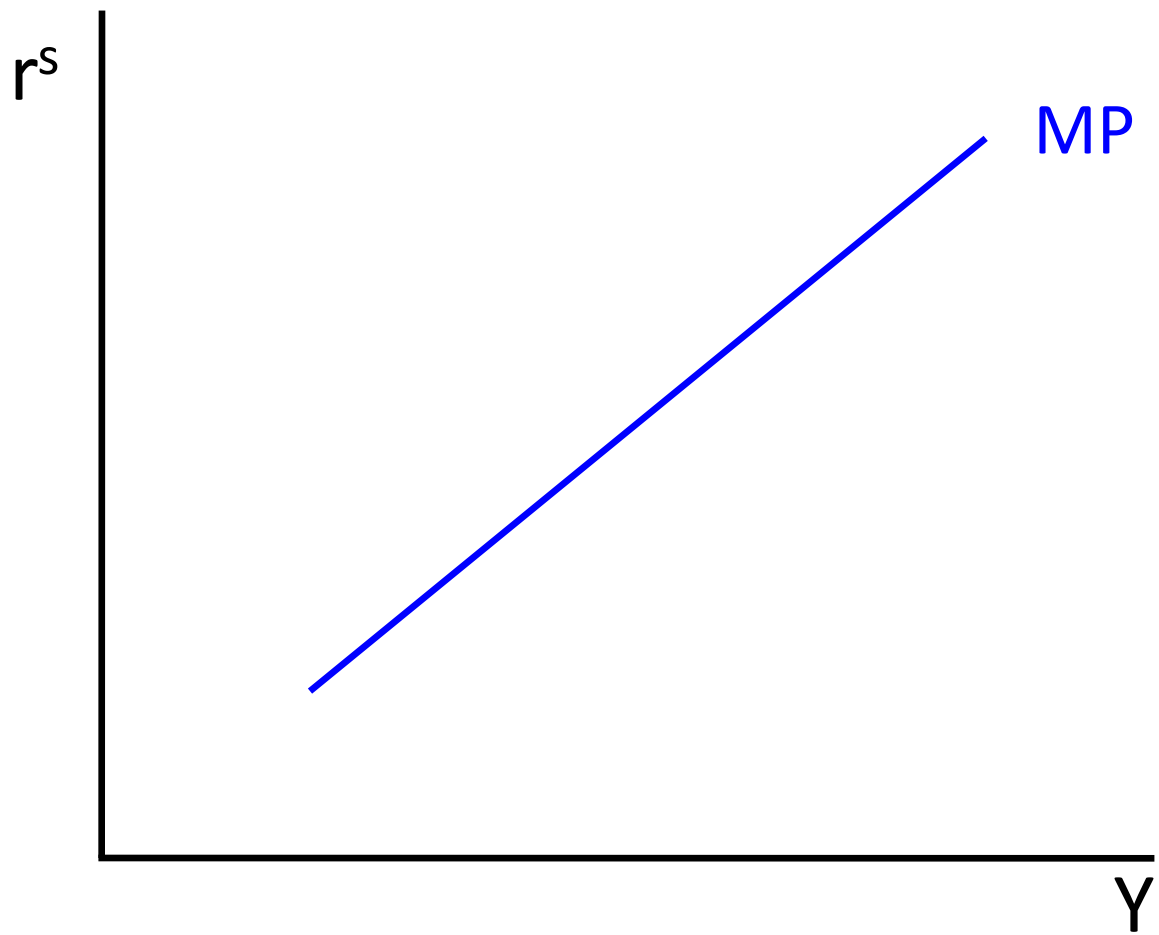
- A financial market disruption shifts the d(Y) function up: the differential at a given Y is higher than before.

Assumptions (III)

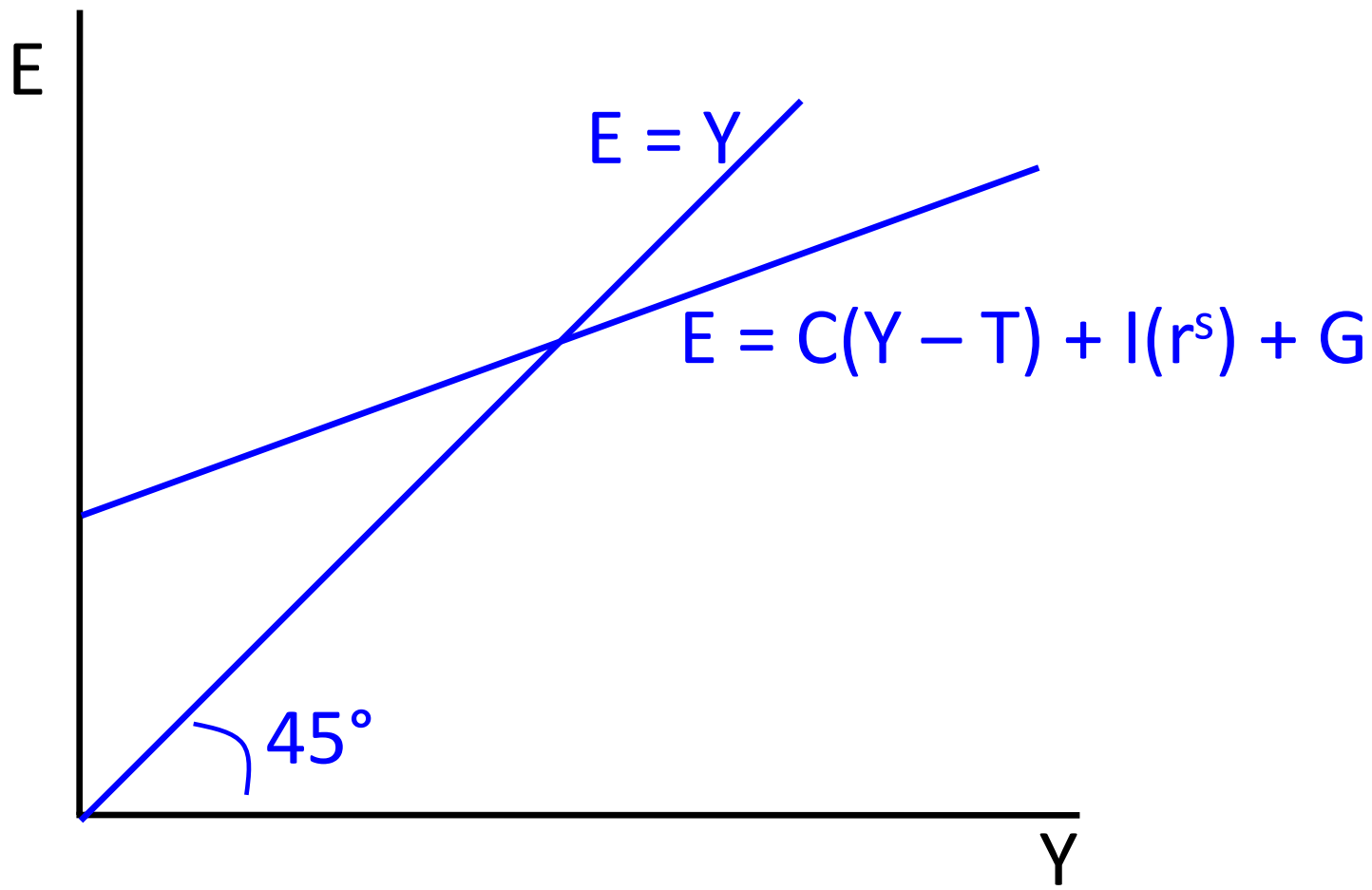
The rest of the model is the same as before:

- $C(Y - T)$: When $Y - T$ rises, consumption rises, but by less than the increase in $Y - T$.
- $I(r^b)$: When r^b rises, desired investment falls.
- G and T are exogenous.
- Inflation adjustment: Inflation rises when $Y > \overline{Y}$, falls when $Y < \overline{Y}$, and holds steady when $Y = \overline{Y}$.

The Effect of Introducing an Interest Rate Differential on the MP Curve? None



The Keynesian Cross without an Interest Rate Differential (so $r^b = r^s$)

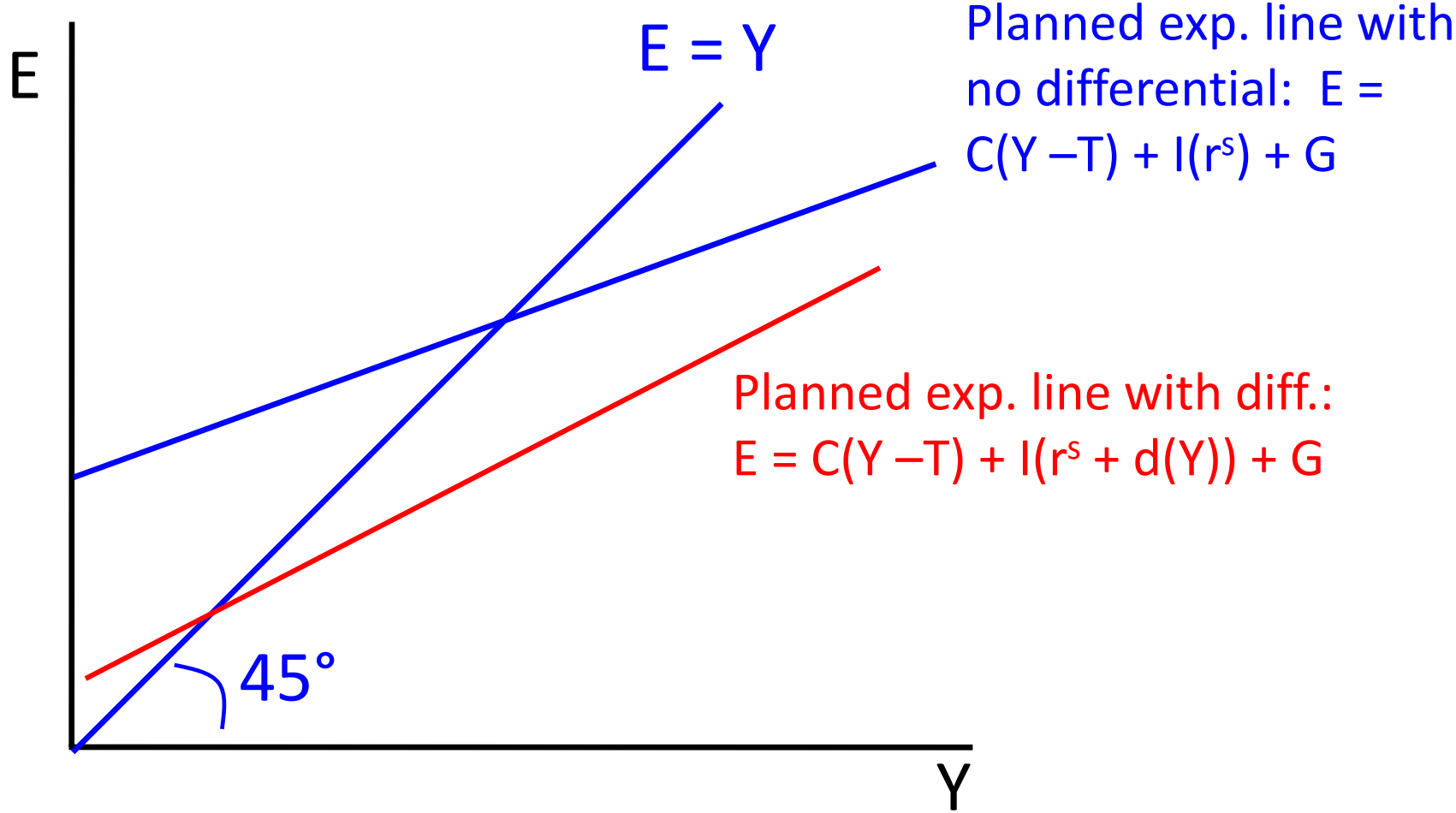


The Effect of Introducing an Interest Rate Differential on the Planned Expenditure Line (I)

We want to find planned expenditure for a given r^s:

- $E = C(Y - T) + I(r^b) + G$
- $r^b = r^s + (r^b - r^s)$
- $r^b - r^s = d(Y)$
- So: $E = C(Y - T) + I(r^s + d(Y)) + G$

The Keynesian Cross with an Interest Rate Differential: $E = C(Y - T) + I(r^S + d(Y)) + G$



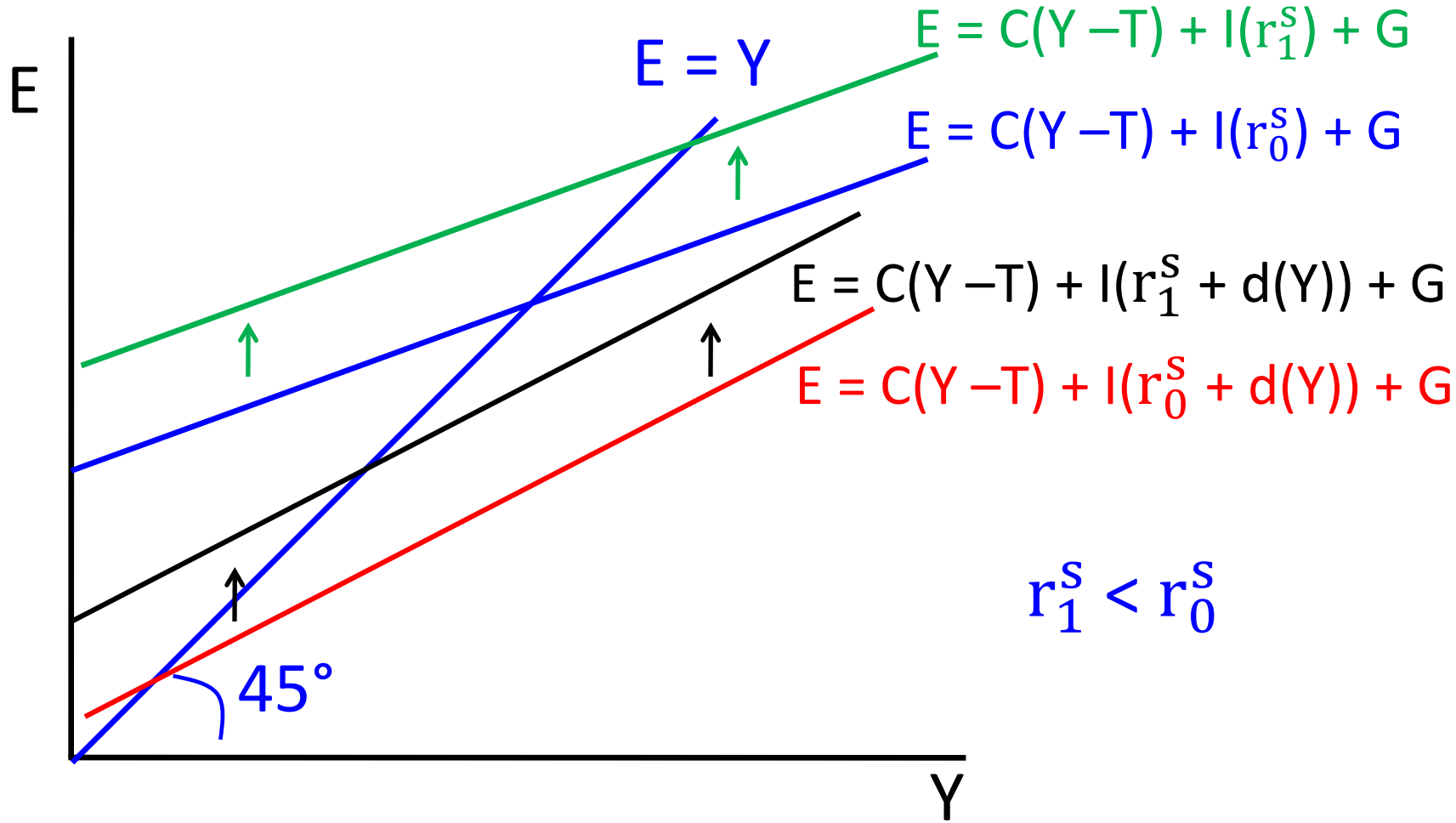
The Effect of Introducing an Interest Rate Differential on the Planned Expenditure Line (II)

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

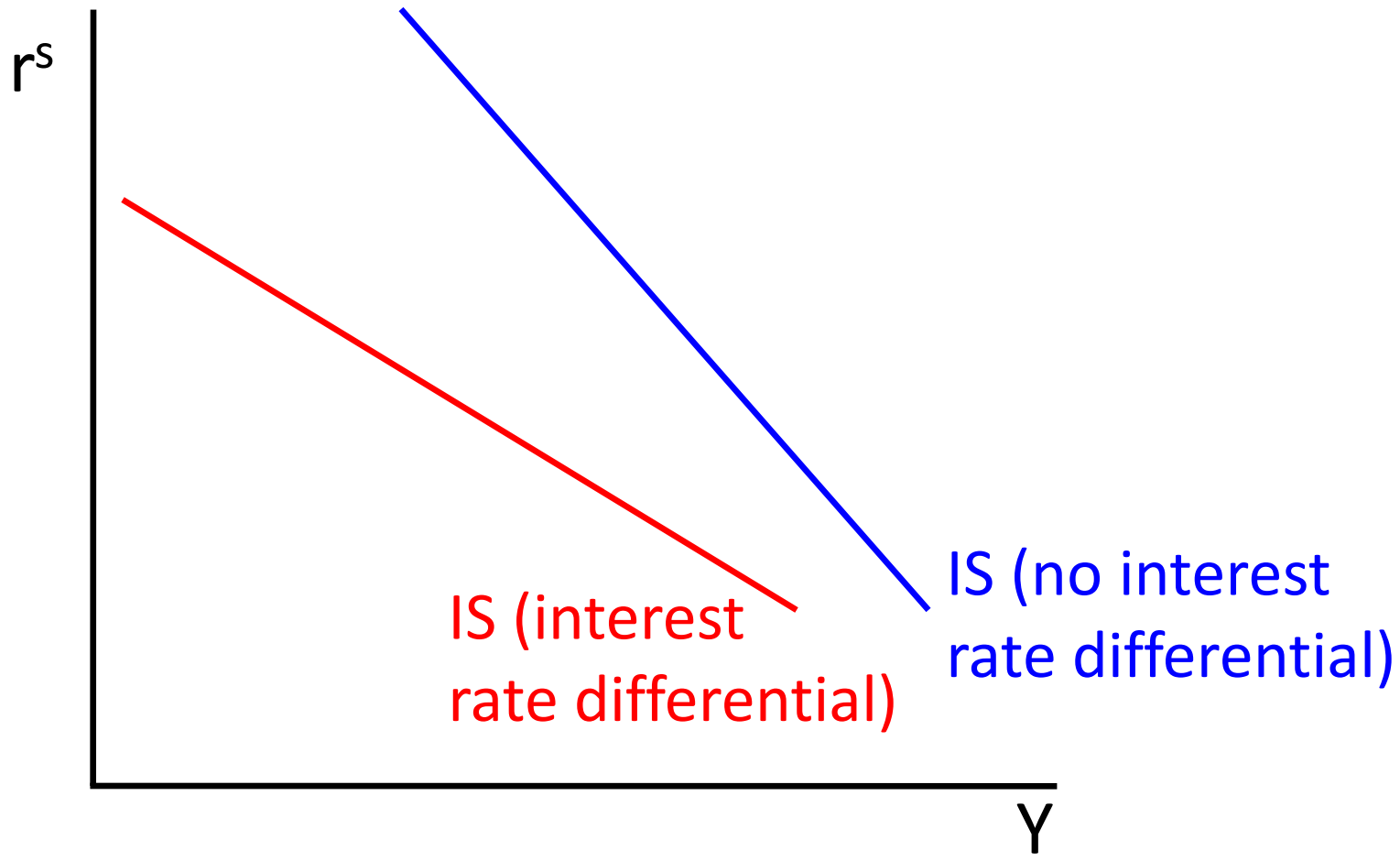
Thus introducing an interest rate differential:

- Shifts the planned expenditure line (for a given r^s) down.
- Makes the planned expenditure line steeper.

The Effect of a Fall in the Saving Int. Rate with and without an Int. Rate Differential



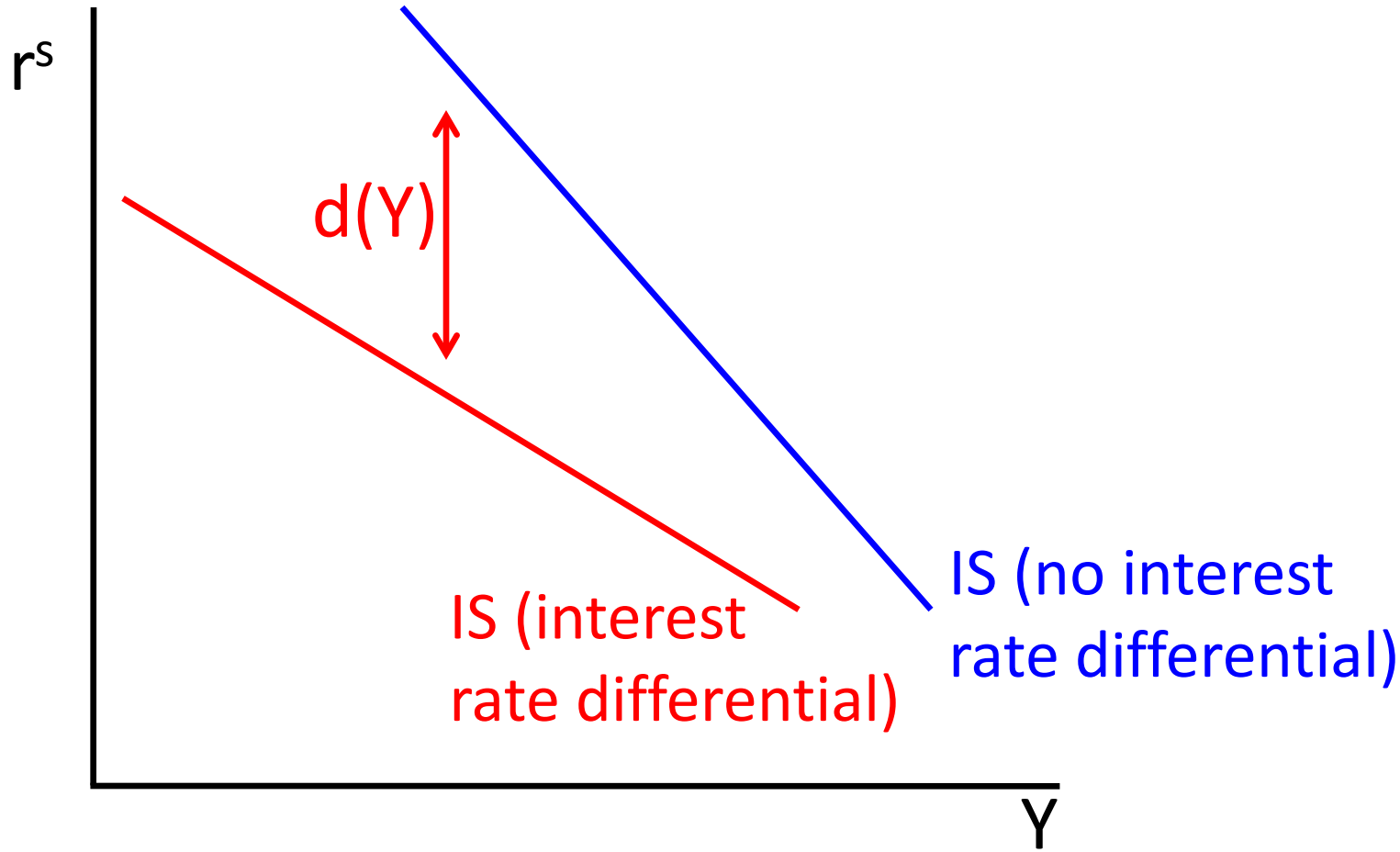
The IS Curve with an Int. Rate Differential



Another Way of Finding How an Interest Rate Differential Affects the IS Curve

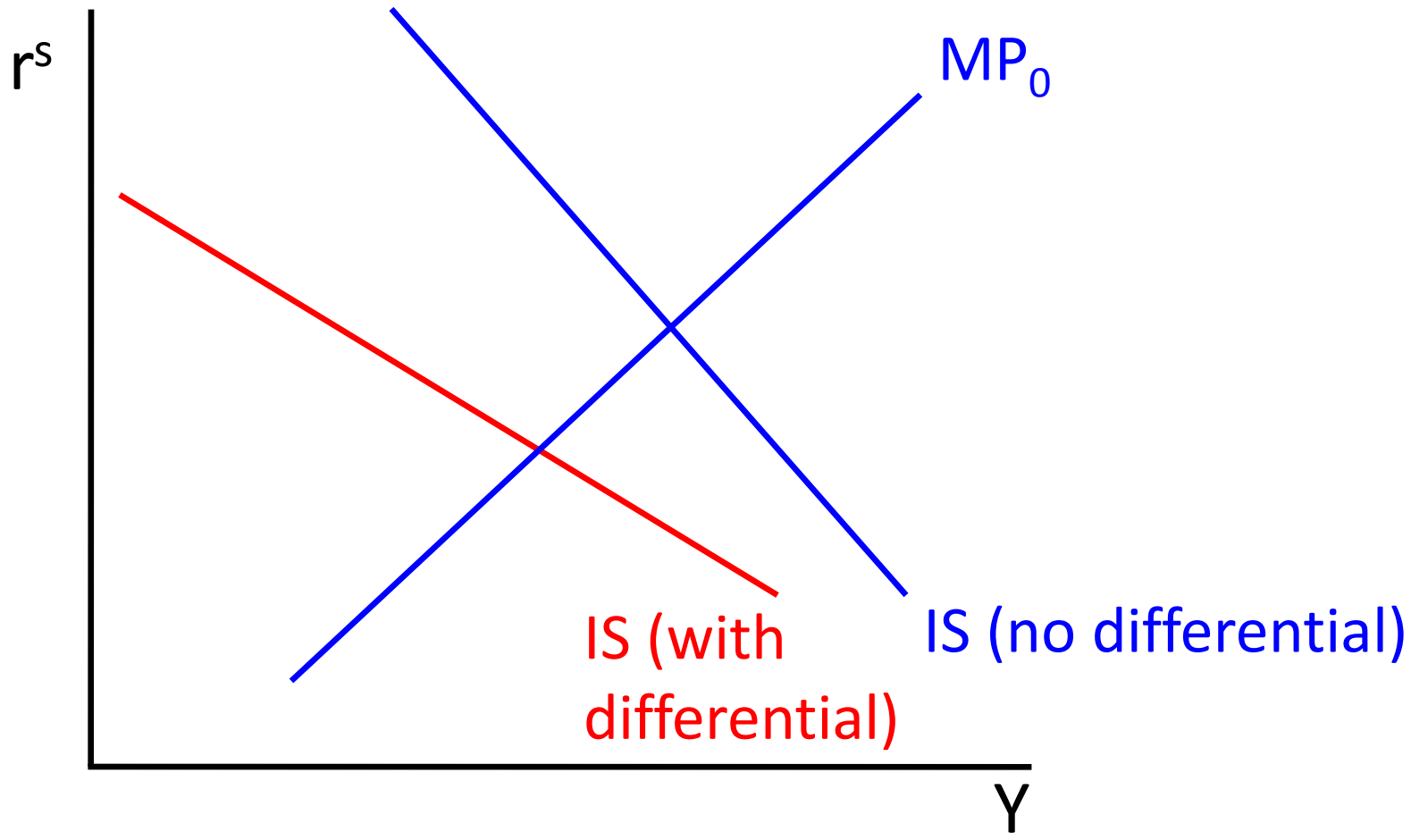
- The IS curve in terms of Y and $\boldsymbol{r^b}$ is the same as before.
- Write r^s as $r^b - (r^b - r^s)$, which is $r^b - d(Y)$.
- So: The IS curve with an interest rate differential lies below the IS curve with no differential by d(Y).

Graphical Version

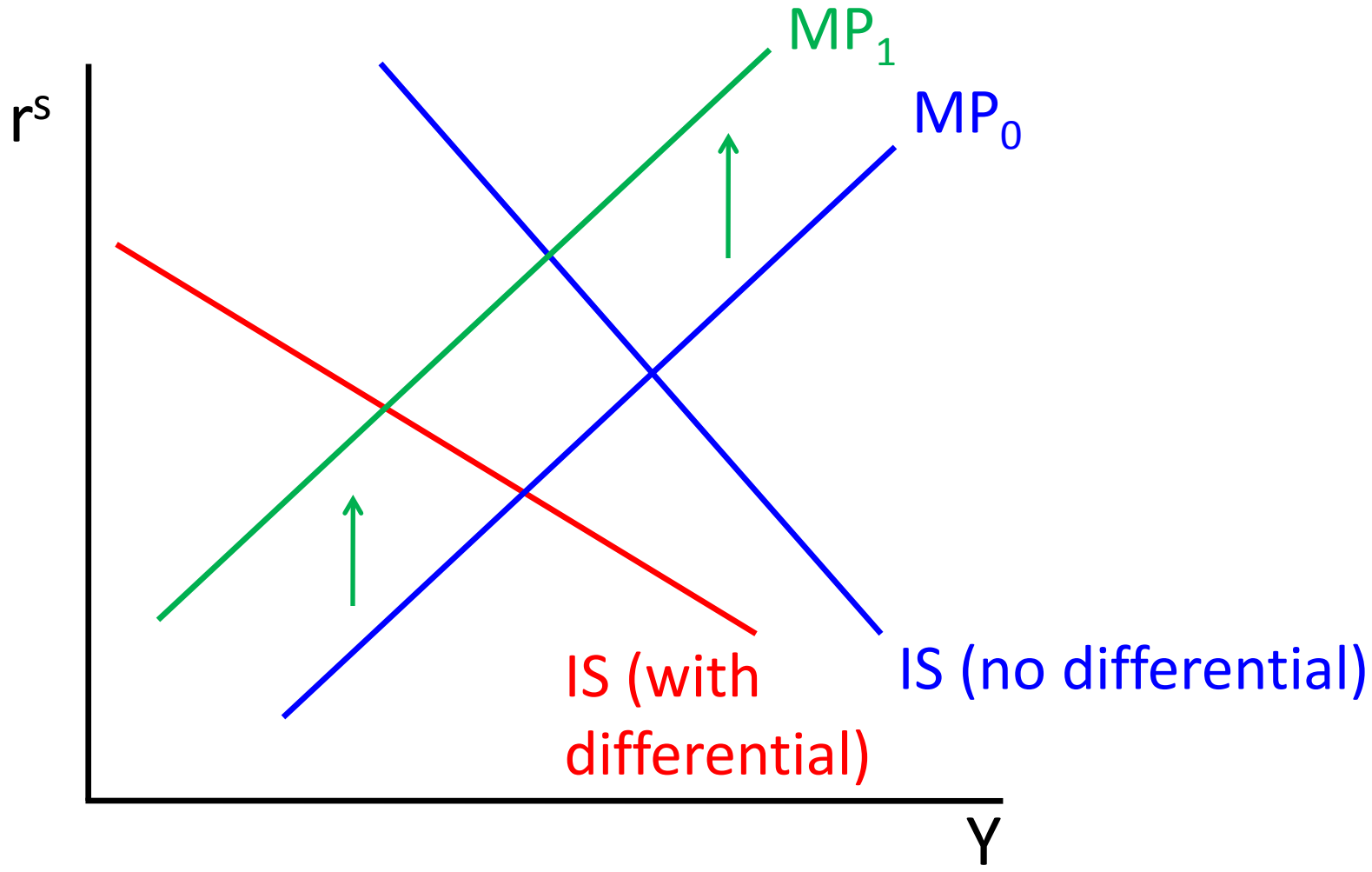


This is just another way of seeing how the interest rate differential affects the IS curve.

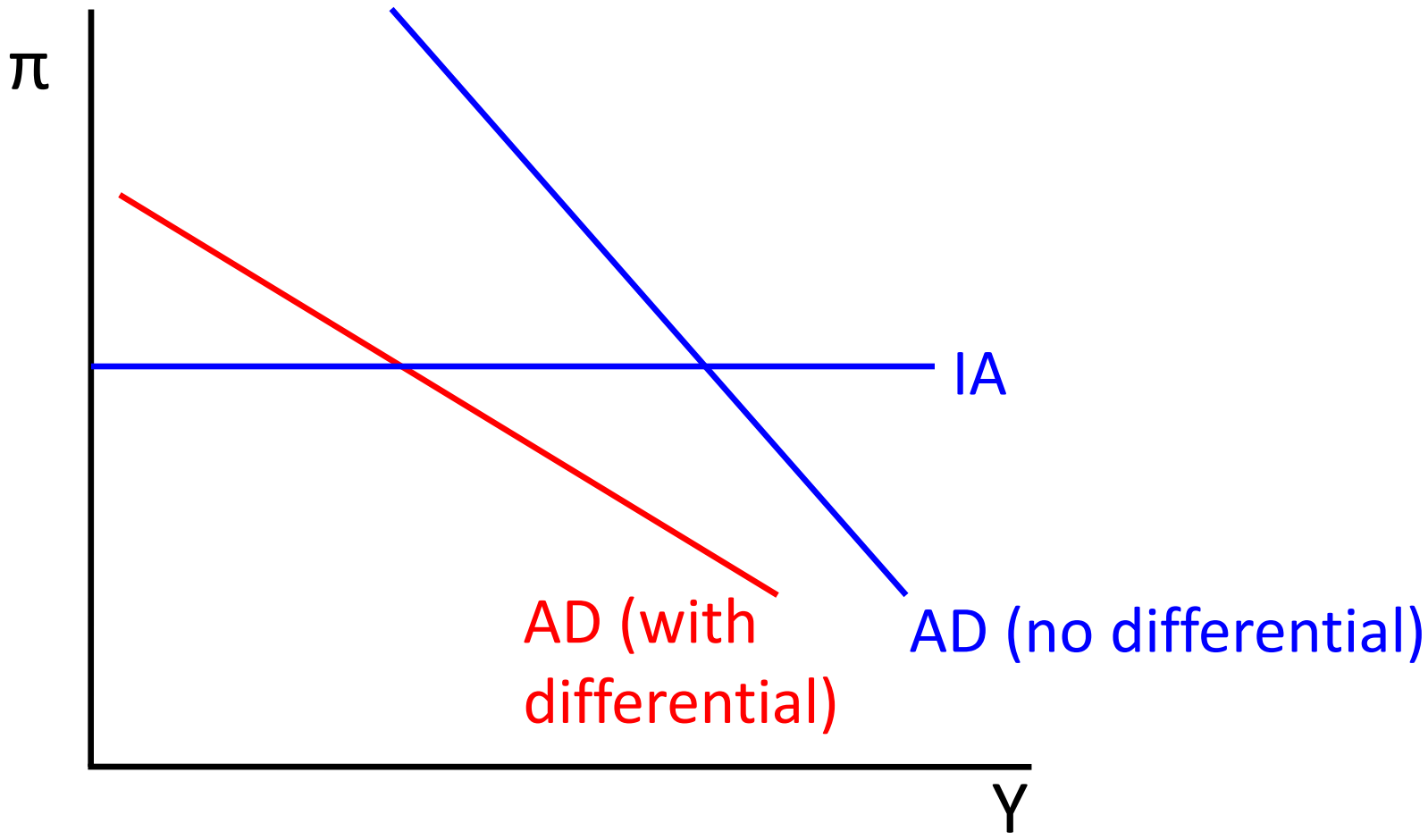
Deriving the AD Curve with an Interest Rate Differential



Deriving the AD Curve with an Interest Rate Differential

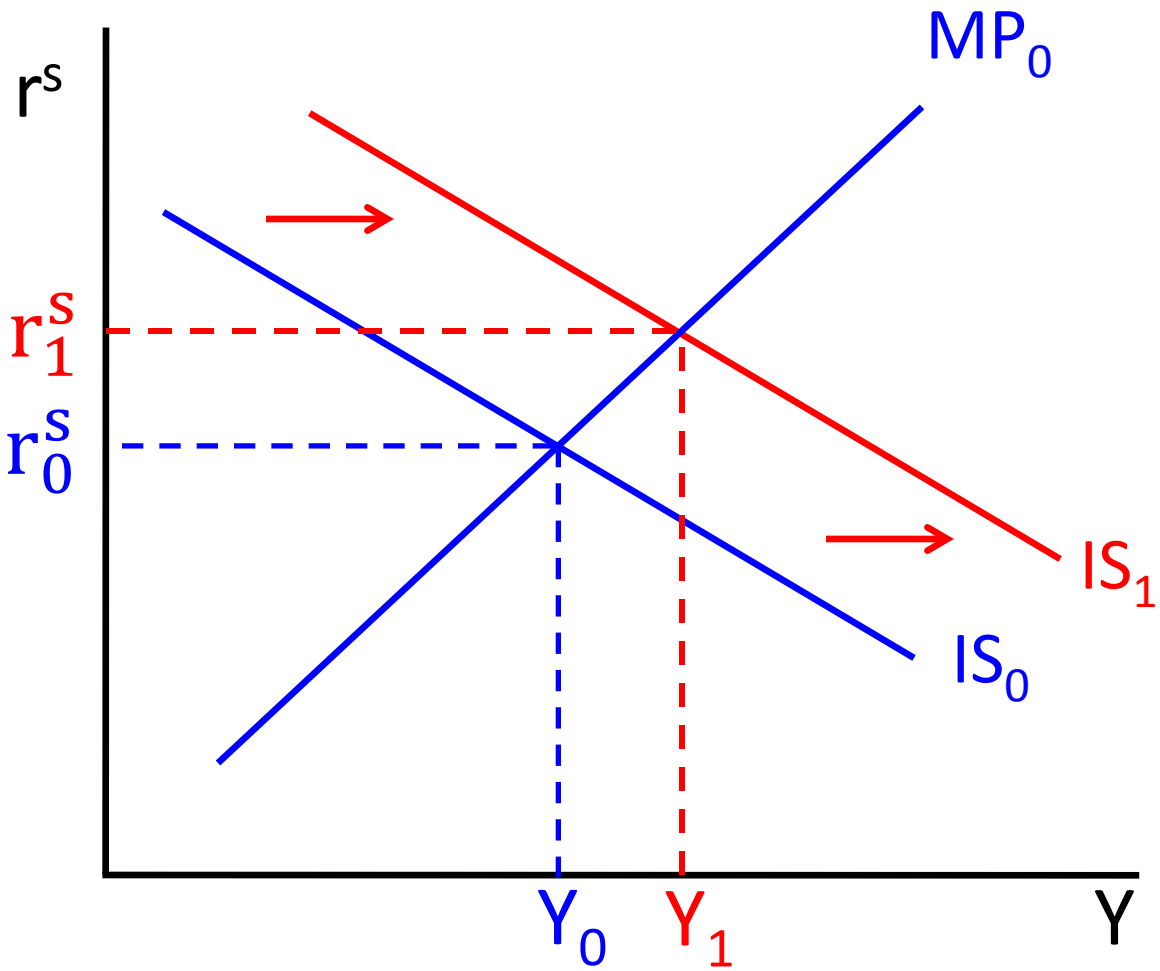


The AD Curve with an Int. Rate Differential



II. Applications

The Effects of a Rise in Consumer Confidence

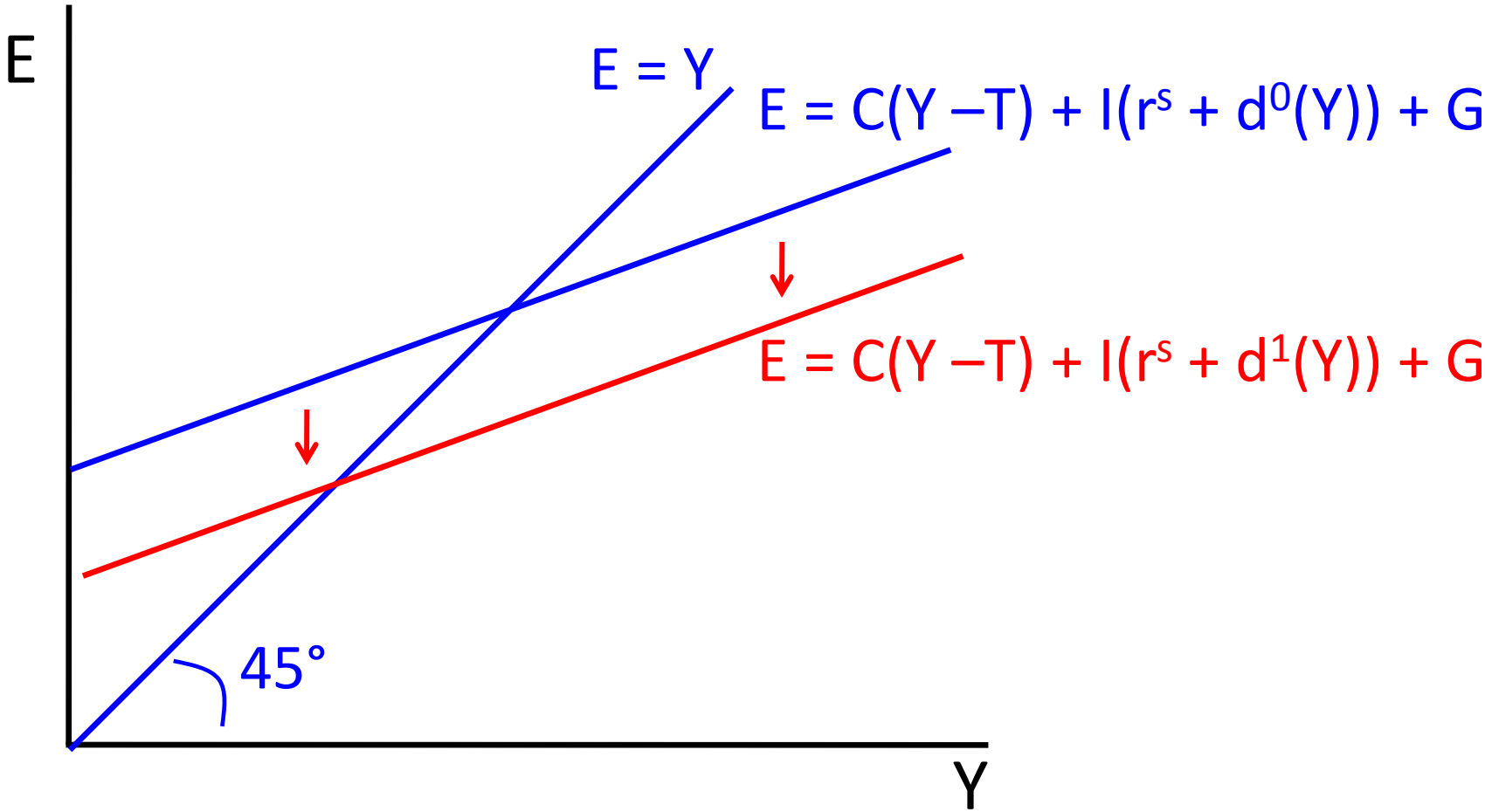


The rise in output is larger than it would be without an int. rate differential.

The “Financial Accelerator”

- Financial market imperfections magnify the effects of shocks.
- When output is higher:
  - Financial intermediaries are more profitable, and so can borrow at lower interest rates.
  - Consumers and firms are in better financial shape, and so can borrow at lower interest rates.
- So: Output rises → interest rate differentials fall → borrowing to finance spending rises → output rises further → …
- A better name might be “financial amplifier.”

The Effects of a Financial Market Disruption (The d(Y) function shifts up, so that $r^b - r^s$ at a given Y is higher than before)



The Effects of a Financial Market Disruption (cont.)

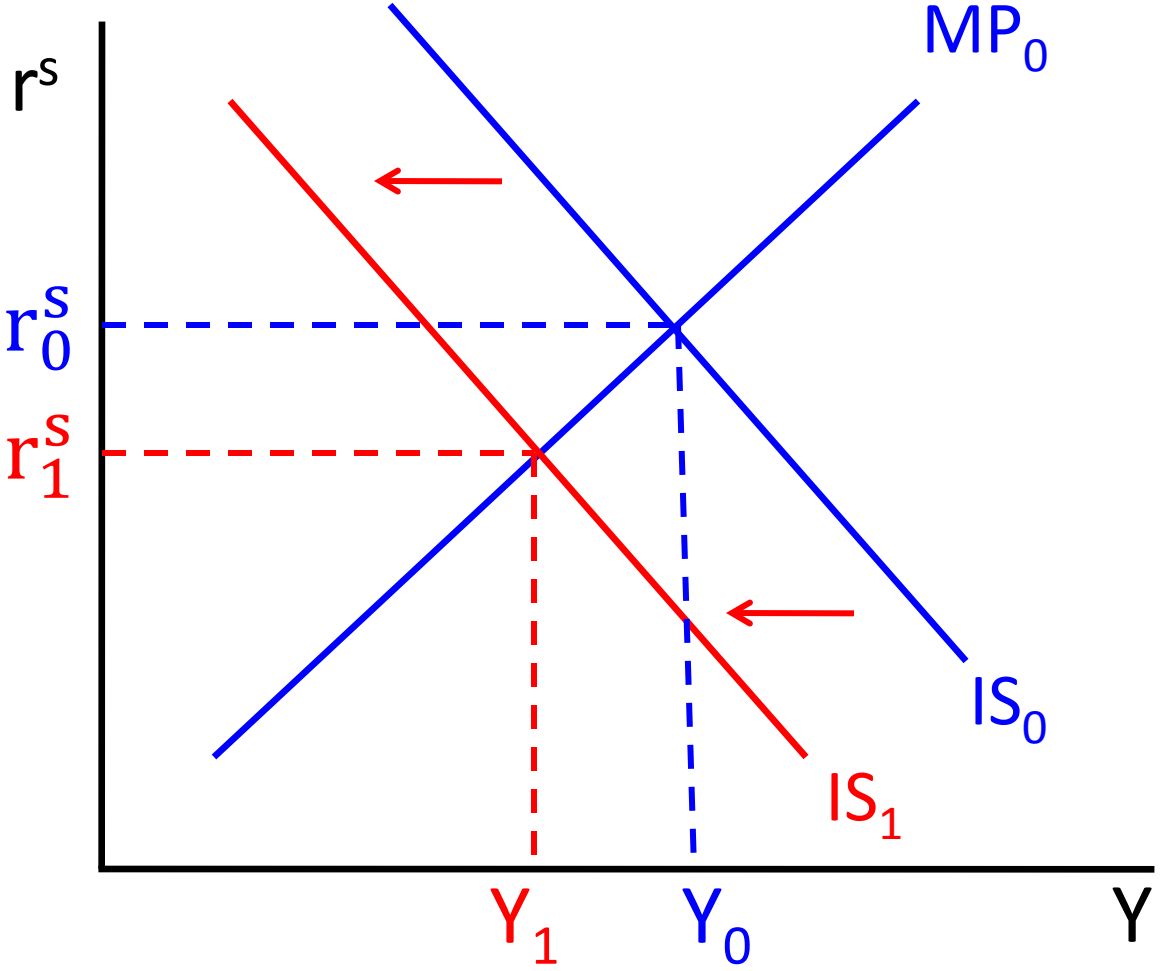
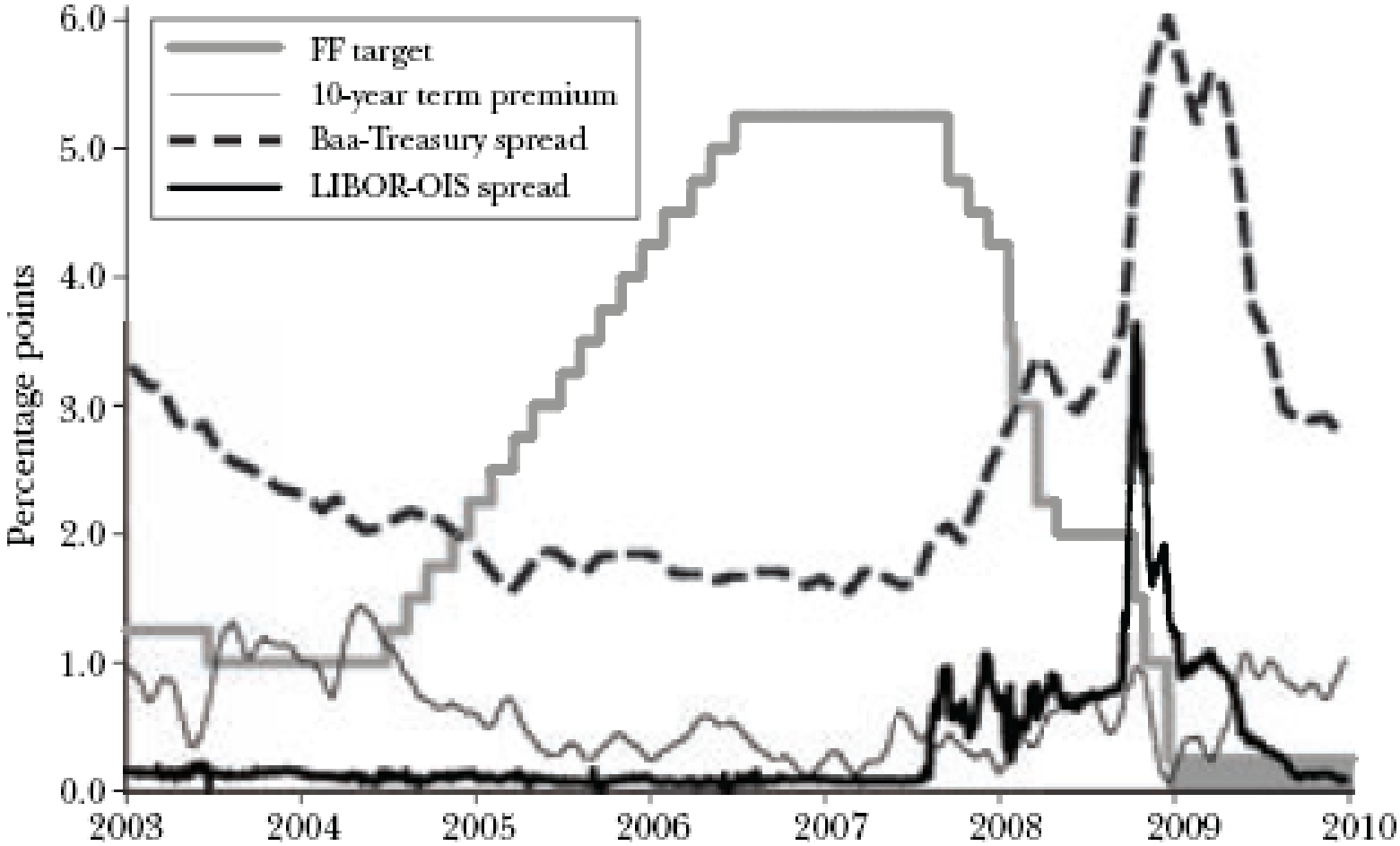
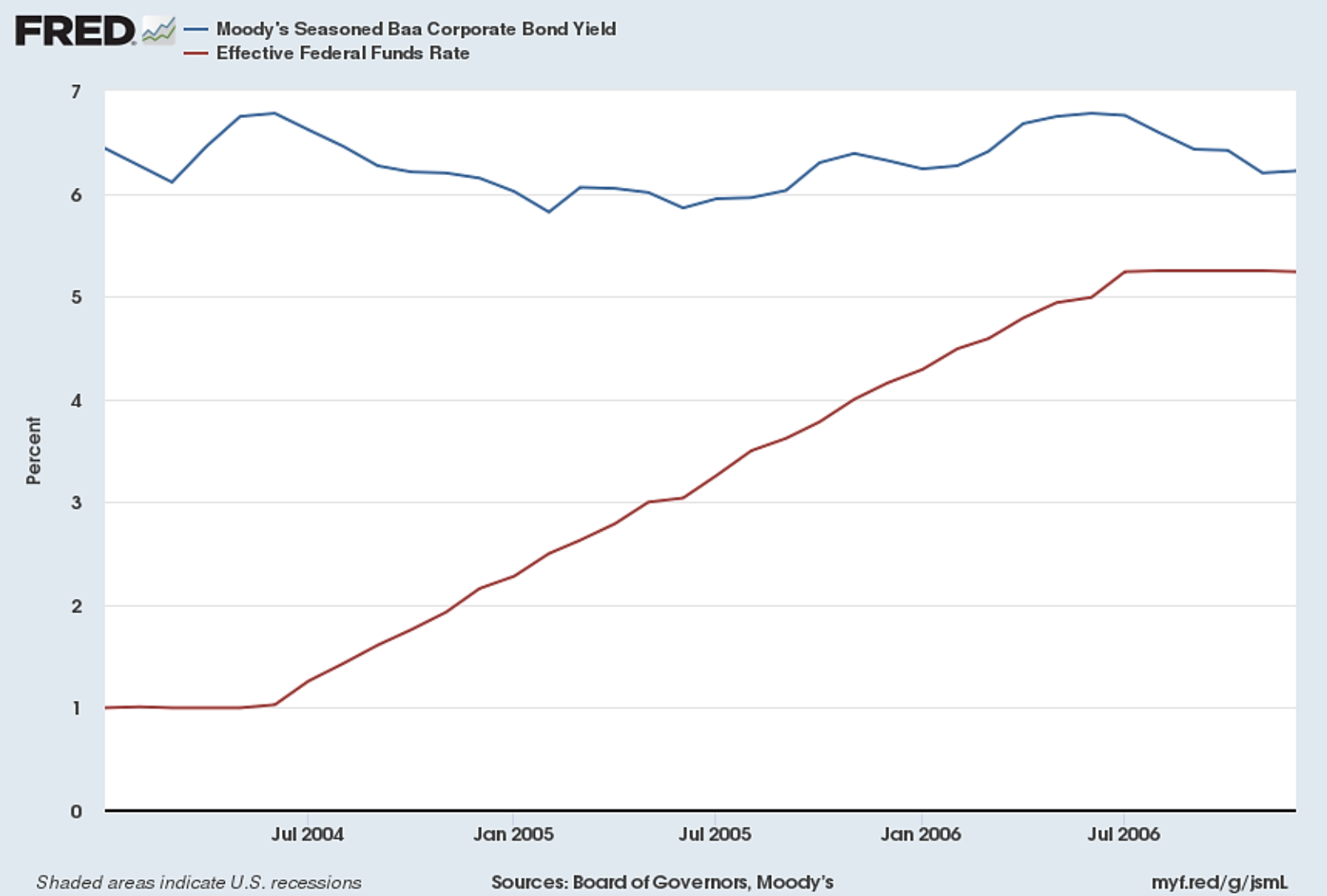


Figure 5

The Federal Funds Rate Target and Some Interest-rate Spreads

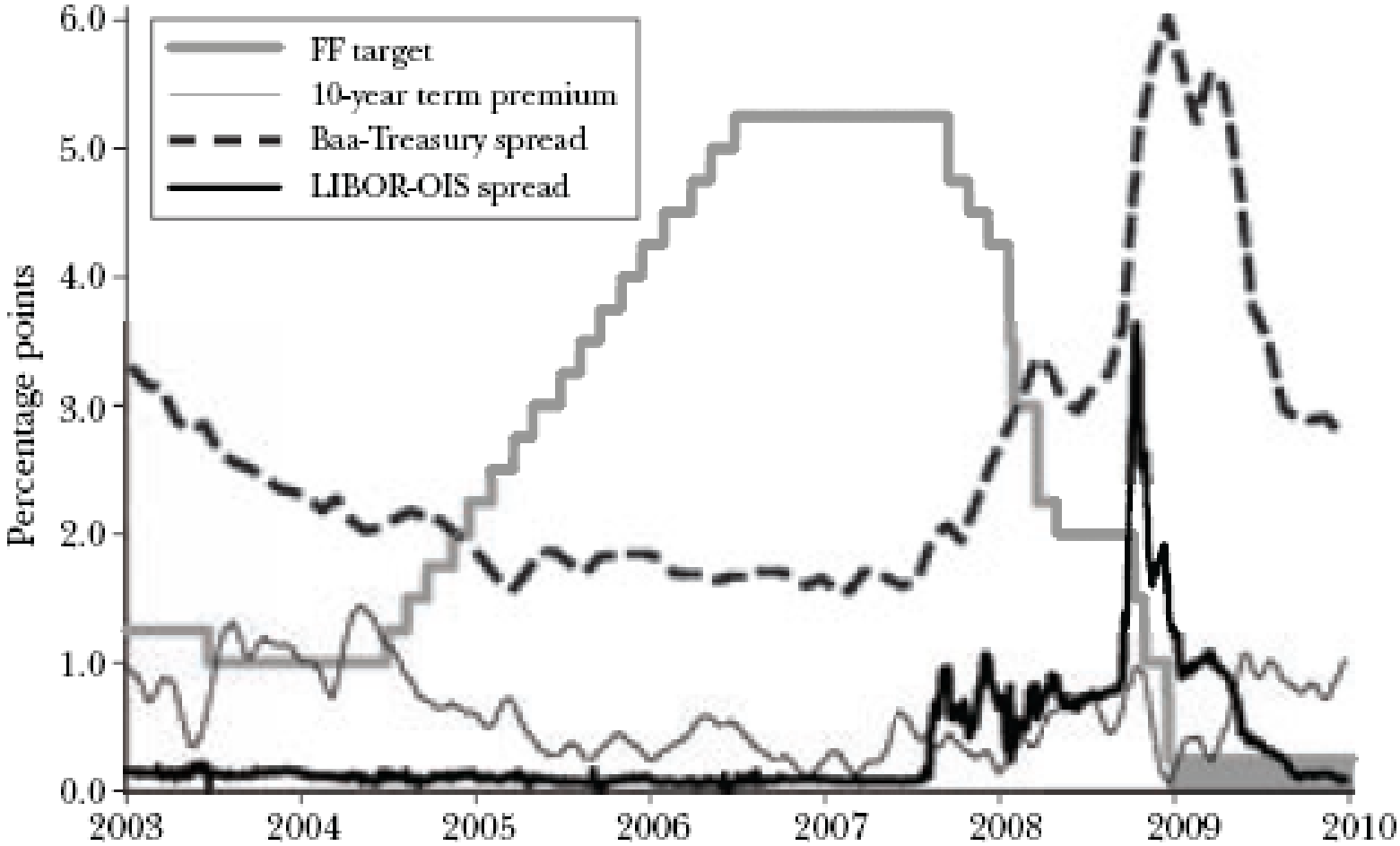


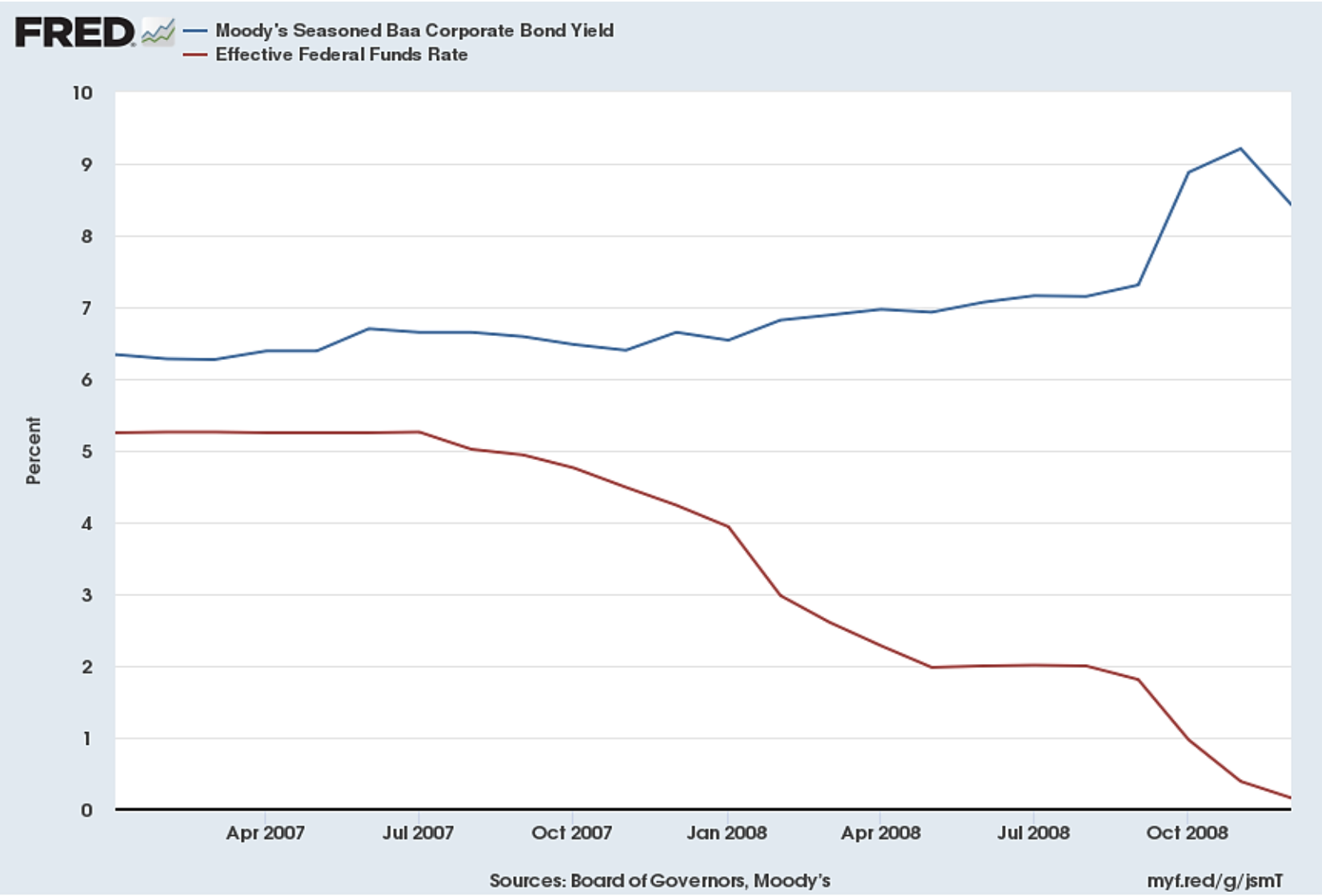


The BAA bond rate was unchanged as the Fed was raising the funds rate in 2004–06.

Figure 5

The Federal Funds Rate Target and Some Interest-rate Spreads





The BAA bond rate rose as the Fed was cutting the federal funds rate in 2007–08.

Possible Implications for Monetary Policy

- Monetary policy should account for interest rate differentials: $r^s = r^s(Y,\pi,r^b - r^s)$, with r^s lower when $r^b - r^s$ is higher.

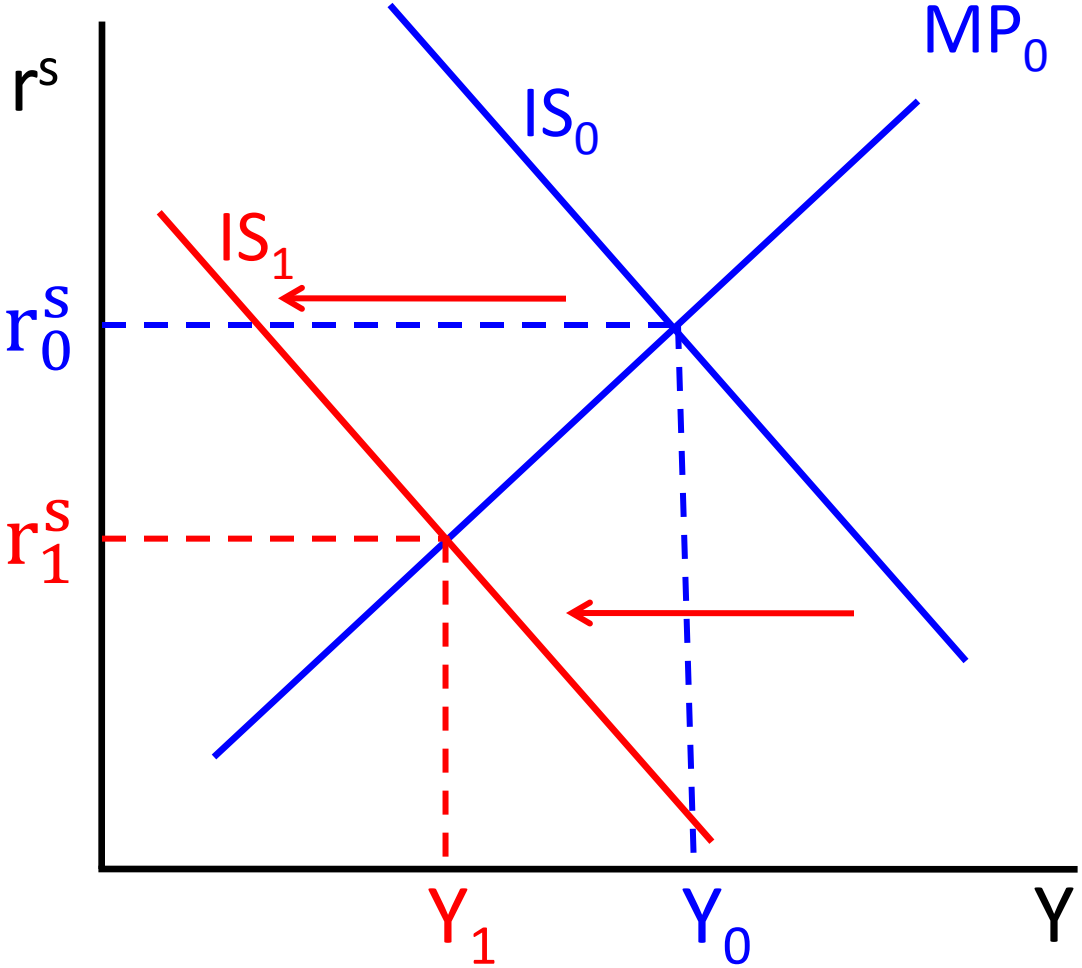
- If credit market disruptions are causing high differentials, the central bank may be able to improve welfare by direct credit market interventions.

III. Financial Crises

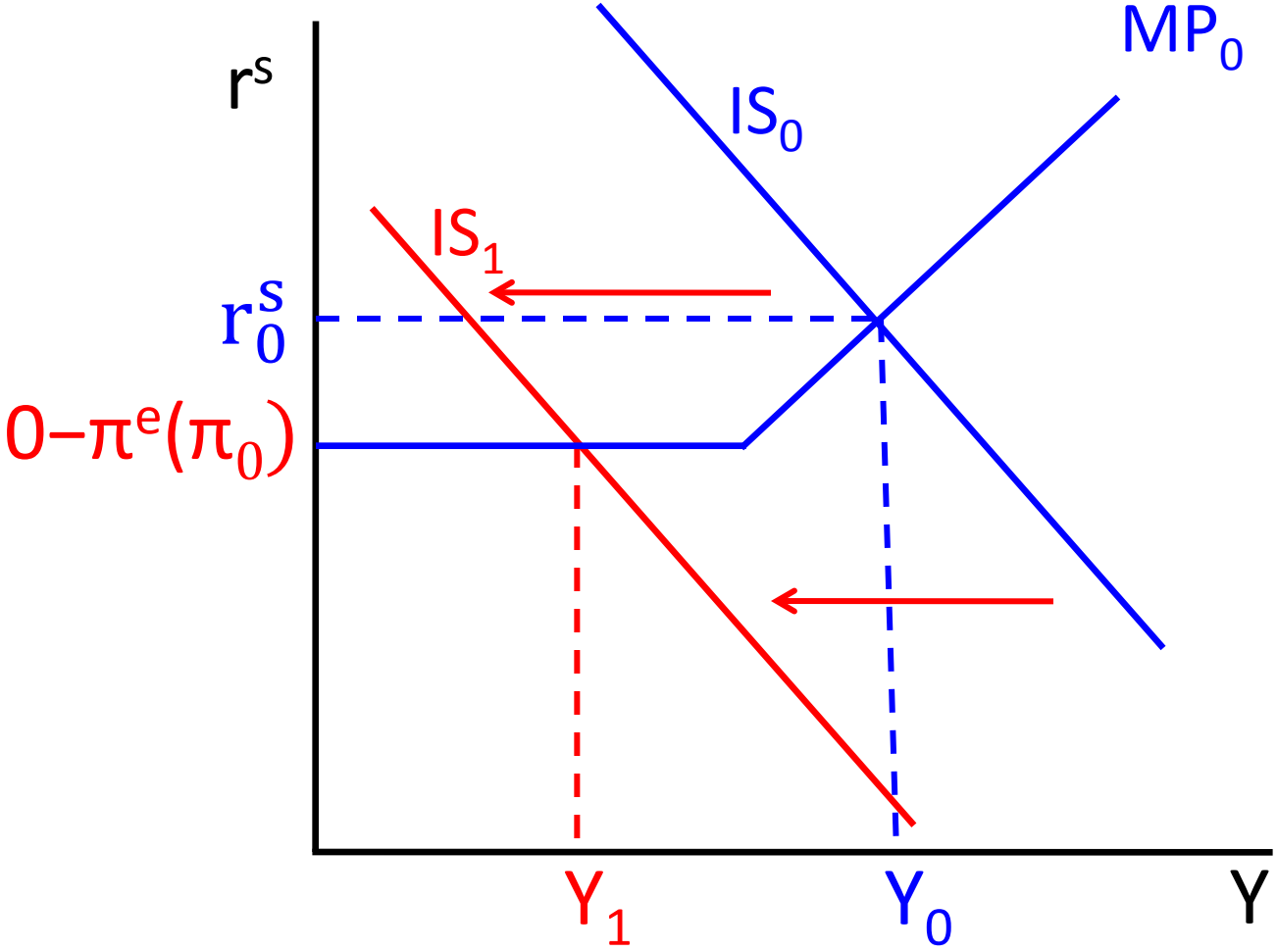
Financial Market Disruptions and Financial Crises

- Financial market problems appear to fall along a continuum.
- As a result, it is difficult to draw a sharp line between a financial market disruption and a financial crisis.

In This View, a Financial Crisis Is Just a Very Large Rise in the d(Y) Function



A Large Shift of the IS Curve Makes It Likely the Zero Lower Bound Will Be Relevant



Why Financial Institutions Are Inherently Vulnerable

- Their liabilities are often largely short-term debt-like obligations: the depositors and lenders can demand repayment of fixed amounts at short notice.
- Their assets (such as mortgage loans) are often long-term, risky, and illiquid.
- The combination of debt-like liabilities and risky assets makes it fairly easy for the institutions to become insolvent.
- And the combination of short-term fixed liabilities and illiquid long-term assets ("maturity mismatch") makes them vulnerable to runs and other liquidity crises.

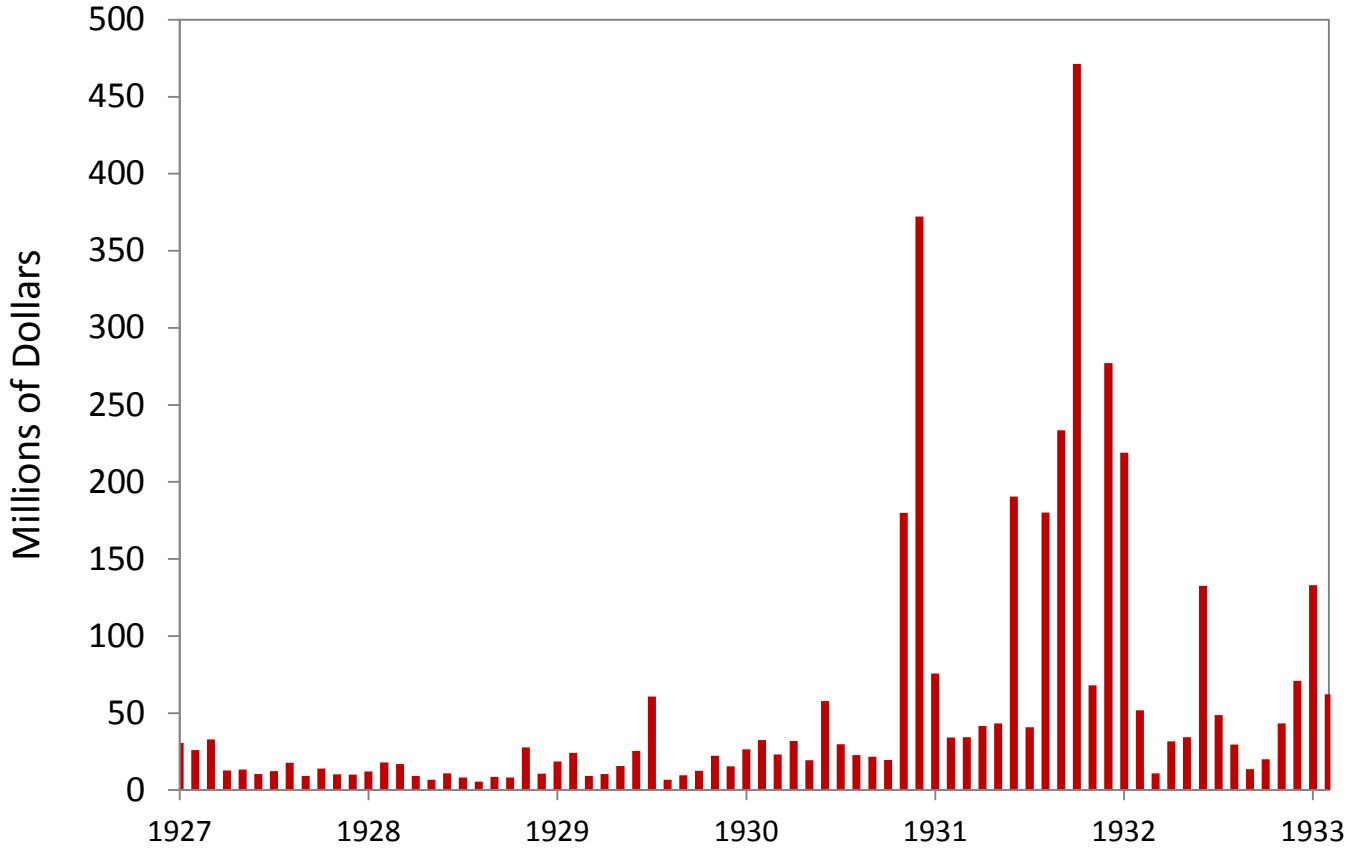
Origins of Major Financial Stress

- Financial stress often arises from large falls of asset prices (bursting of asset price bubbles).
- If financial institutions are holders of the assets (directly or indirectly), the falls in asset prices can cause them to get into trouble.
- Why the U.S. did not have a financial crisis in 2000.

The Amplification of Financial Stress: Contagion

- Confidence: Troubles at one institution create doubts about the health of other institutions, even if there are no connections between them.
- Linkage: Troubles at one institution directly harm other institutions because of loans, insurance contracts, and other direct links among them.
- Fire Sale: Troubles at one institution cause it to sell assets, driving down the prices of assets held by other institutions.
- Macroeconomic: Troubles at one institution cause the planned spending line to shift down; hence IS shifts to the left and Y falls, which harms other institutions.

Deposits in Failed or Suspended Banks, 1927-1933



Source: Federal Reserve.