

LECTURE 23

THE EFFECTS OF FINANCIAL CRISES

APRIL 18, 2018

I. REVIEW OF IS-MP FRAMEWORK WITH AN INTEREST RATE DIFFERENTIAL

- A. IS-MP with two interest rates, r^s and r^b
- B. Example: A shift to tighter monetary policy
- C. Modeling a financial crisis

II. SHORT-RUN MICRO EFFECTS OF A FINANCIAL CRISIS

- A. Ivashina and Scharfstein's question
- B. Why this is a difficult question to answer
 - 1. The behavior of bank loans
 - 2. Distinguishing reduced supply from other reasons for lower lending
- C. Ivashina and Scharfstein's approach
 - 1. Basics
 - 2. Possible omitted variable bias?
- D. Results
- E. Discussion

III. LONG-RUN MACRO EFFECTS OF FINANCIAL CRISIS

- A. Reinhart and Rogoff's thesis
- B. Sample
- C. Findings
- D. Possible types of explanations
- E. Discussion

Economics 134
Spring 2018

David Romer

LECTURE 23

The Effects of Financial Crises



April 18, 2018

Announcements

- Problem Set 4:
 - Due at the *beginning* of lecture next time (April 23).
 - Optional problem set work session:
Thursday, April 19, 5–7, in 597 Evans Hall.
- We will have a guest lecture next time.

Final Exam – Basics

- Mechanics:
 - Monday, May 7, 3–6 P.M.
 - Students with DSP accommodations: You will receive an email from me.
- Coverage: Whole semester. But:
 - There will be more emphasis on the material after the midterm.
 - There won't be any multiple choice questions that are specifically about the readings from before the midterm.

Final Exam – Types of Questions

- Broadly similar to the midterm:
 - Multiple choice
 - Short answers
 - Problems
 - Essay (or essays)

Final Exam – Places to Get Help

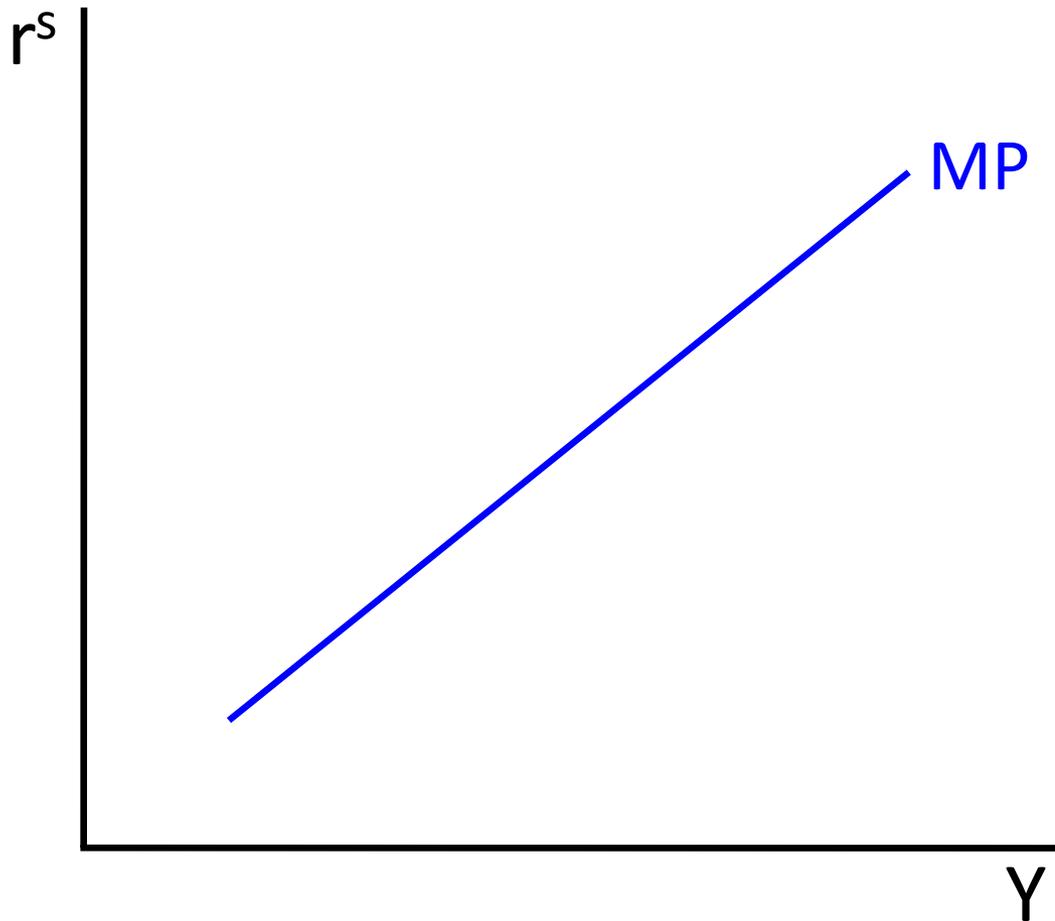
- Q&A/Review session: Wednesday, May 2, 4–6 P.M., 10 Evans.
- My office hours in RRR week: Thursday, May 3, 1–3 P.M.
- GSI office hours.
- And remember that there is a set of sample exam questions on the course website.

I. REVIEW OF IS-MP MODEL WITH A CREDIT SPREAD

Expanding the IS-MP Model

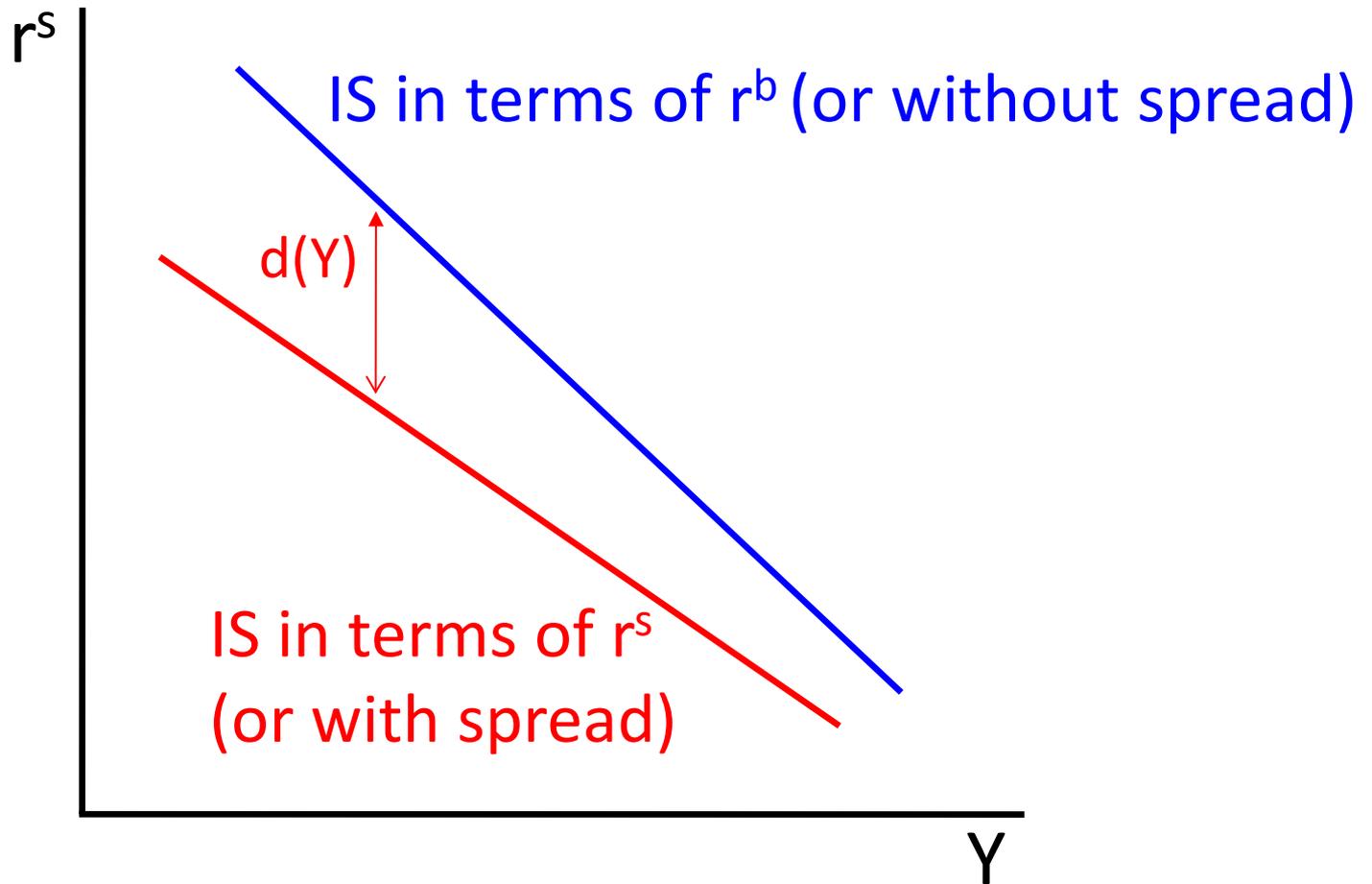
- 2 real interest rates:
 - The saving or safe real interest rate, r^s .
 - The borrowing or risky real interest rate, r^b .
- The MP and IS curves depend on different rates.
- The ***difference*** between the two rates, $r^b - r^s$, depends on Y : $r^b - r^s = d(Y)$. $D(Y)$ is positive, and a decreasing function of Y .

The MP curve depends on r^s : $r^s = r^s(Y, \pi)$



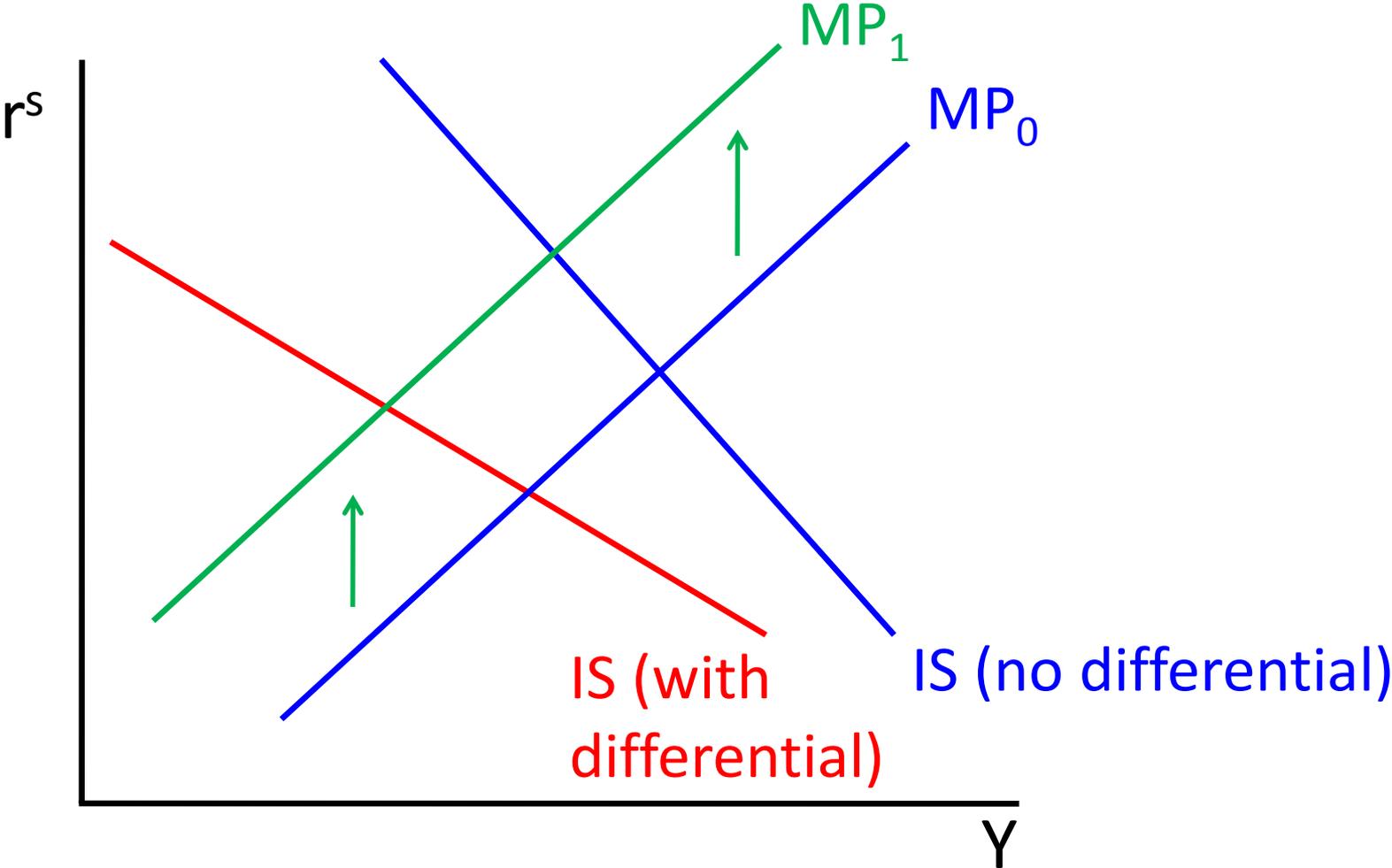
MP curve in (Y, r^s) space looks the same as before.

The IS curve depends on r^b ; $r^s = r^b - (r^b - r^s)$
 $r^b - r^s = d(Y)$



Accounting for the spread makes IS lower and flatter than before.

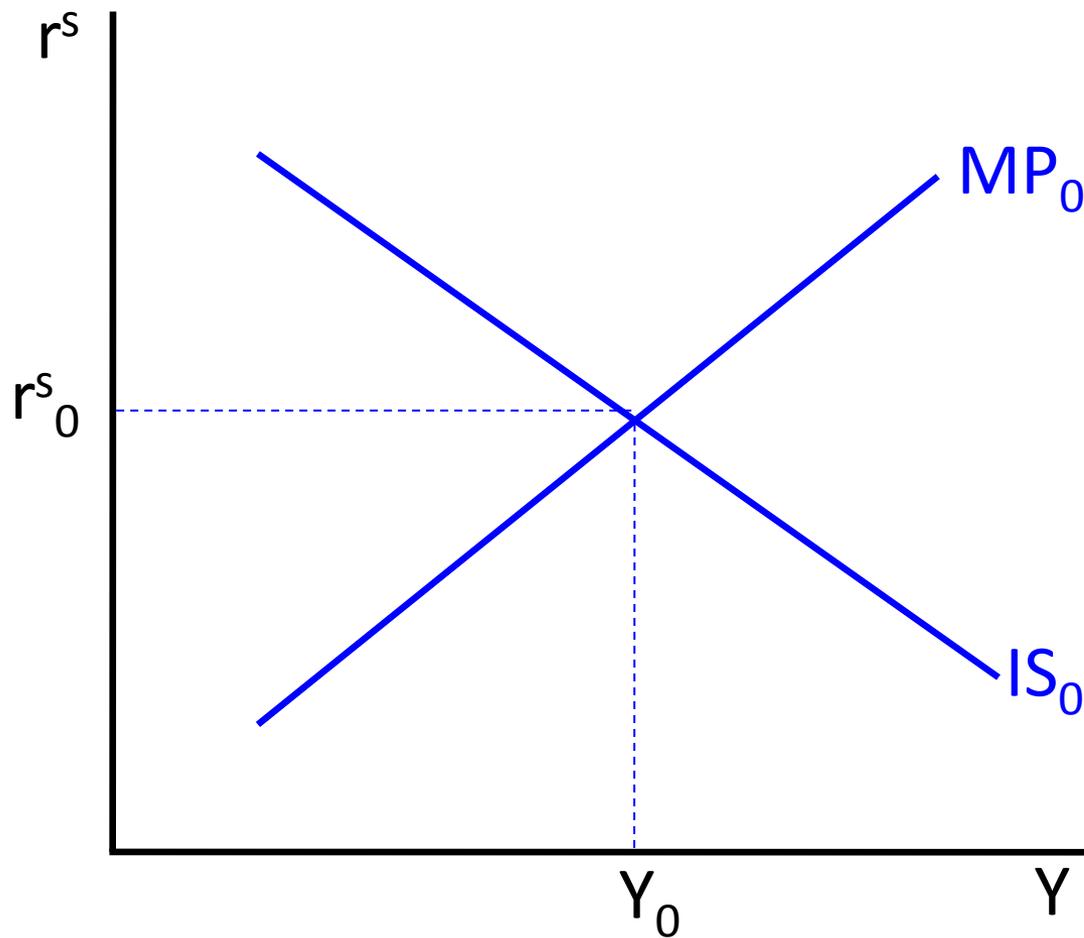
Example: A Shift to Tighter Monetary Policy



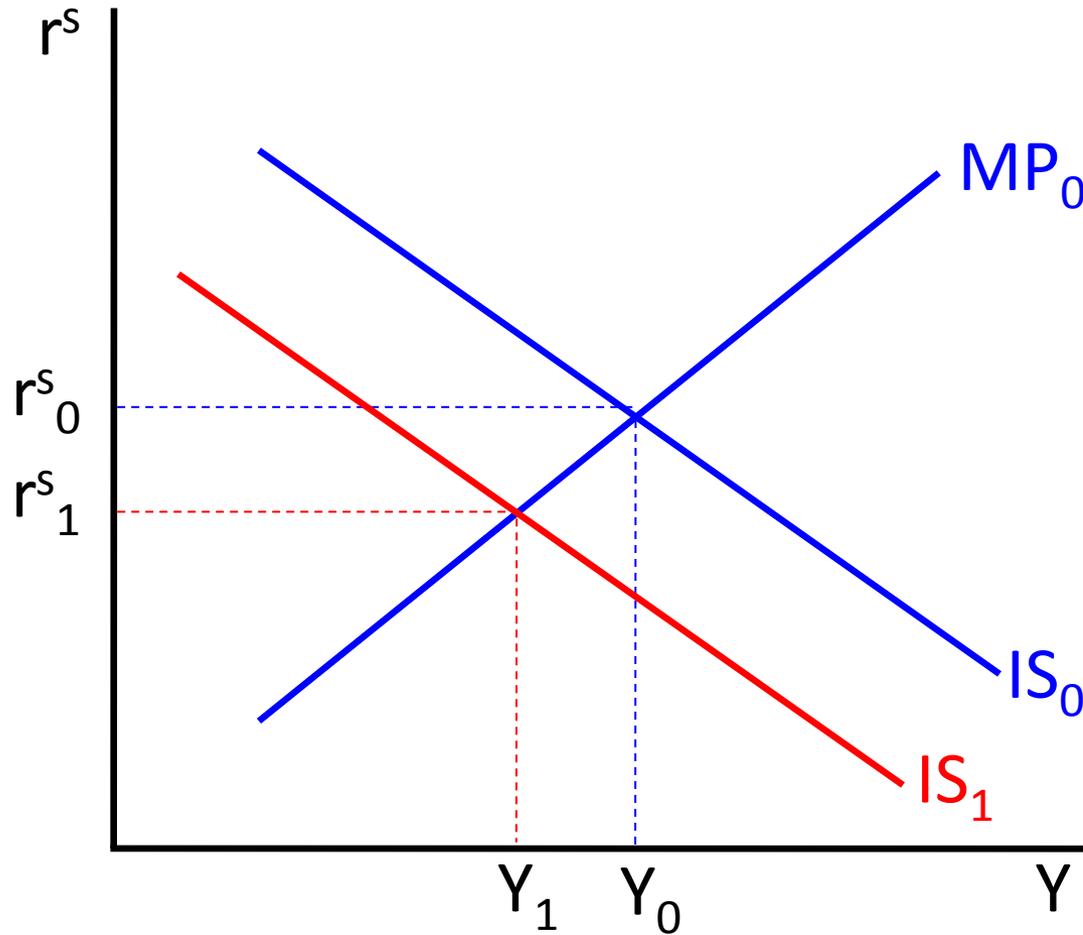
A Shift to Tighter Monetary Policy

- r^s rises and Y falls.
- Can we determine what happens to r^b ?
 - r^s and $d(Y)$ both rise, so r^b must rise.
- Can we determine how the fall in Y in the extended model compares with the fall in the model with no interest rate differential?
 - The IS curve is flatter, so the fall in Y is greater.
 - (This is another example of the “financial accelerator.”)

A financial crisis increases $r^b - r^s$ at a given Y .
(That is, it is an upward shift of the $d(Y)$ function.)

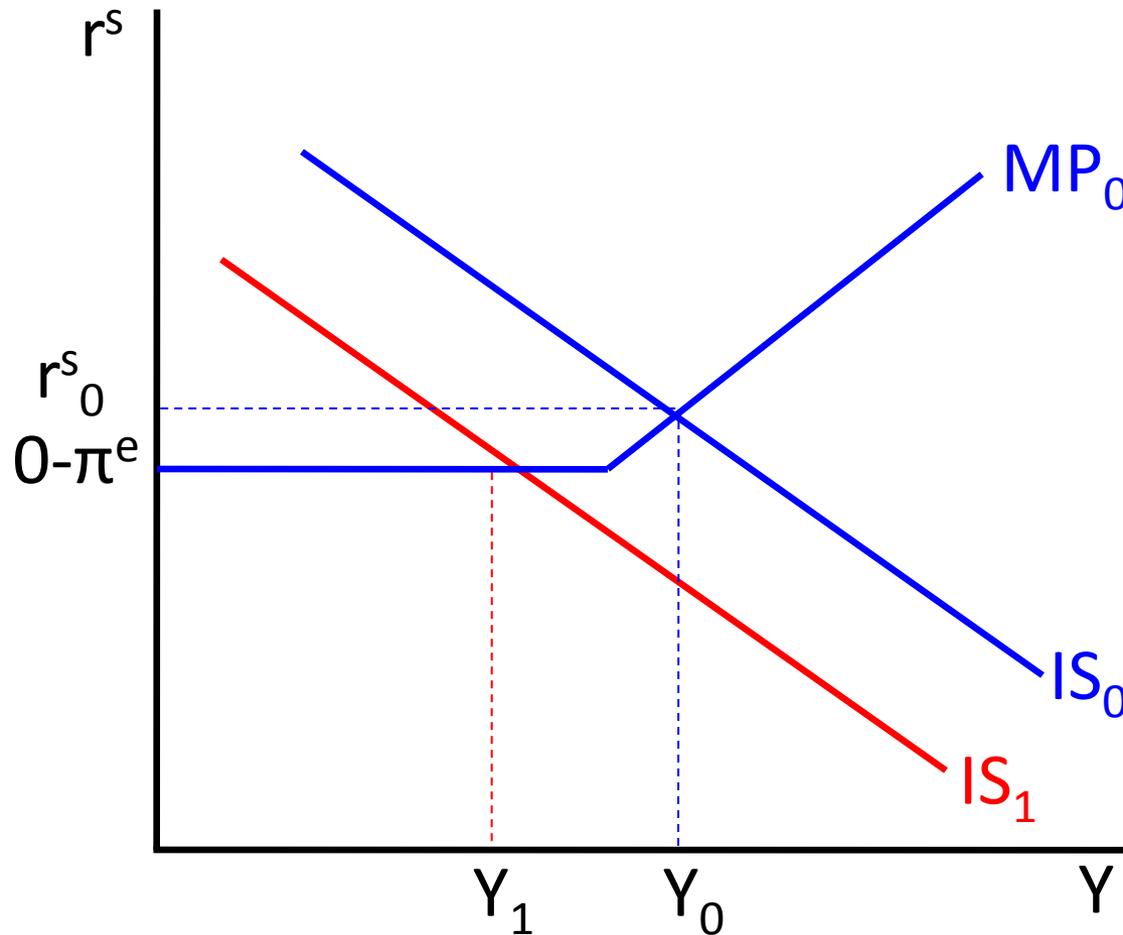


A financial crisis increases $r^b - r^s$ at a given Y .
IS shifts down.



r^s and Y both fall.

Financial Crisis with Zero Lower Bound



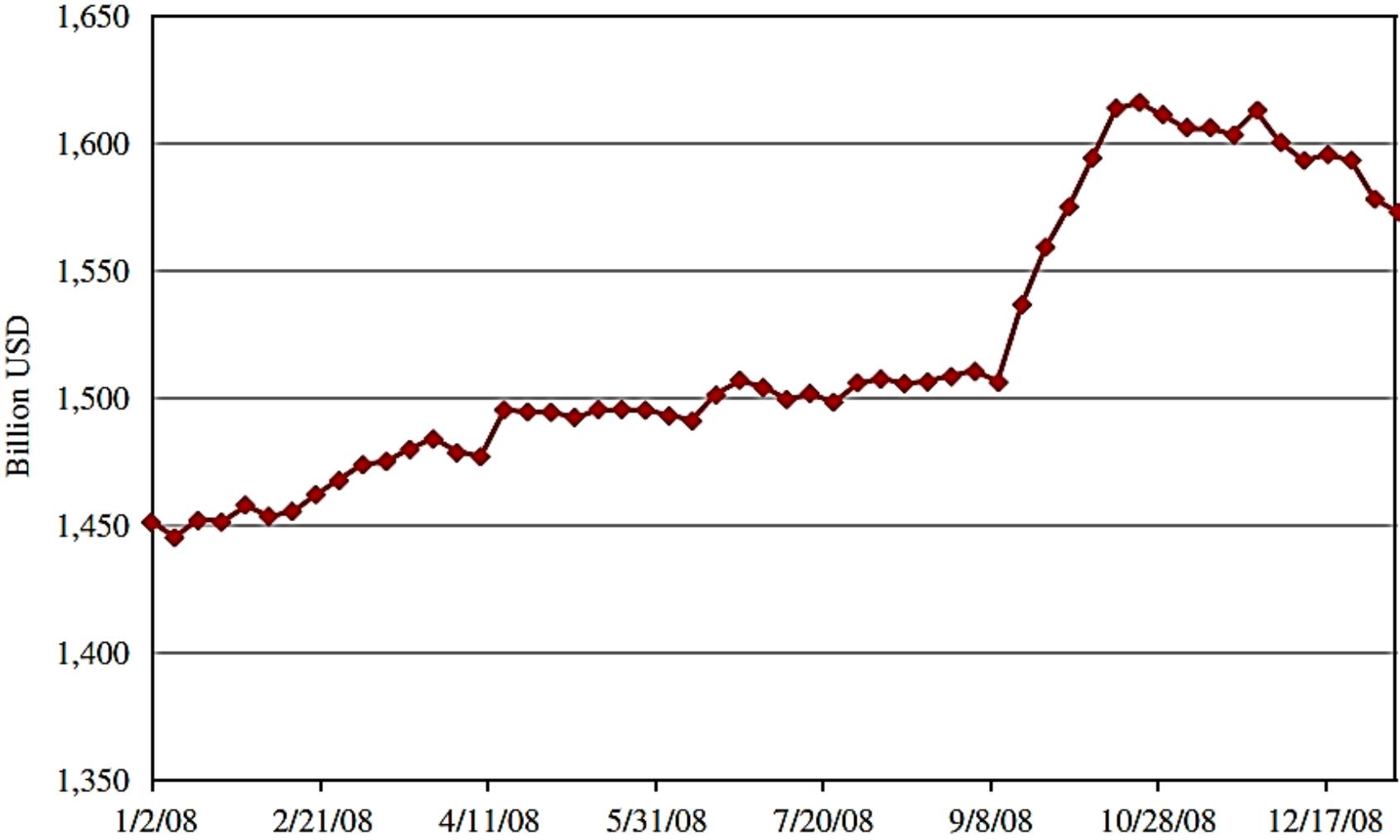
If crisis makes the economy hit the zero bound, r^s can't fall as much and Y falls more.

II. SHORT-RUN MICRO EFFECTS OF A FINANCIAL CRISIS (IVASHINA AND SCHARFSTEIN PAPER)

Ivashina and Scharfstein's Question

- Did the bankruptcy of Lehman reduce the availability of credit?

Commercial and Industrial Bank Credit Outstanding Went Way *Up* Following the Lehman Bankruptcy



Commercial and Industrial Bank Credit Outstanding Went Way Up Following the Lehman Bankruptcy

- Does this indicate that limited credit supply was not a problem after the Lehman bankruptcy?
- What is Ivashina and Scharfstein's explanation for the rise in loans?
 - They argue that the rise was the result of firms drawing on ***existing*** lines of credit.

What Is Ivashina and Scharfstein Evidence for Their Proposed Explanation?

- **New** lending appears to have fallen sharply.
- Annual data show a large fall in unused credit lines as a percentage of total credit lines in 2008.
- Survey data show very large credit line drawdowns in one week in November.
- There were numerous media reports of firms drawing on their credit lines in the 3 months after mid-August 2008 (and virtually none in the 3 months before).

Recall Ivashina and Scharfstein's Question: Did the bankruptcy of Lehman reduce the availability of credit?

- Why wouldn't it be persuasive to just look at whether lending fell?
 - As we've just discussed, credit lines complicate the interpretation of data on lending!
 - More fundamentally, a fall in lending could reflect a decline in credit demand rather than in credit supply.

Recall Ivashina and Scharfstein's Question: Did the bankruptcy of Lehman reduce the availability of credit?

- Suppose we saw that the quantity of lending fell *and* that credit terms became more onerous (for example, increases in interest rates). Would that be persuasive?
 - It could reflect a decline in borrower quality (for example, greater riskiness) rather than reduced credit supply to a borrower of a given quality.

How Do Ivashina and Scharfstein Address Their Question?

- They look at cross-section evidence: especially, variation *across* banks.
- They argue that two variables potentially affected a bank's credit supply:
 - Fraction of the bank's funding that was from "wholesale" sources rather than retail deposits.
 - Amount of the bank's lending that was "cosyndicated" with Lehman.

Might There Be Omitted Variable Bias?

- Consider the regression

$$\Delta\text{Lending}_i = a + b\text{Wholesale}_i + e_i,$$

where i indexes banks, $\Delta\text{Lending}$ is the percent change in a bank's lending, and Wholesale is the fraction of its deposits from wholesale sources.

- Ivashina and Scharfstein's big concern: Maybe the firms that borrowed from banks that relied more on wholesale funding differed systematically from the firms that borrowed from banks that relied less on wholesale funding.

What Is Ivashina and Scharfstein Argument That There Is Not Major Omitted Variable Bias?

- Mainly: On dimensions we can observe, the firms that borrowed from banks that relied more on wholesale funding look pretty similar to the firms that borrowed from banks that relied less on wholesale funding.

Results: Retail Funding

	(1) %Δ Total number of loans Crisis II vs. Crisis I	(2) %Δ Total number of loans Crisis II vs. Pre- crisis	(3) %Δ Total number of loans (lead bank) Crisis II vs. Crisis I	(4) %Δ Total number of loans (lead bank) Crisis II vs. Pre-crisis	(5) %Δ Total amount of loans (lead bank) Crisis II vs. Crisis I	(6) %Δ Total amount of loans (lead bank) Crisis II vs. Pre-crisis
<i>Panel A: All loans</i>						
Deposits/ Assets	0.22*	0.42***	0.56**	0.91***	0.27	0.81**
	[0.11]	[0.11]	[0.22]	[0.26]	[0.21]	[0.30]
Constant	-0.57***	-0.79***	-0.60***	-0.83***	-0.62***	-0.86***
	[0.06]	[0.04]	[0.10]	[0.08]	[0.12]	[0.08]
Observations	38	38	38	38	38	38
R-squared	0.11	0.24	0.18	0.22	0.05	0.14
<i>Panel B: Real investment loans</i>						
Deposits/ Assets	0.32*	0.50***	0.79*	1.44***	0.17	0.98***
	[0.19]	[0.16]	[0.41]	[0.41]	[0.28]	[0.32]
Constant	-0.51***	-0.72***	-0.49**	-0.81***	-0.52***	-0.75***
	[0.10]	[0.07]	[0.20]	[0.13]	[0.15]	[0.14]
Observations	38	38	38	38	38	38
R-squared	0.11	0.21	0.10	0.14	0.01	0.06

Note: “Pre-crisis” is 8/06-7/07; “Crisis I” is 8/07-7/08 ; “Crisis II” is 8/08-12/08.

Interpreting the Economic Magnitude of the Point Estimates—Example

- The estimate of 0.56 in Column (3).
- “The average bank experiences a 34% drop in the number of lead syndications; however, the estimated coefficients imply that banks with deposits one standard deviation above the mean experience a 14% drop, while banks one standard deviation below the mean experience a 51% drop.”

Results: Retail Funding and Lehman Cosyndication

	(1) %Δ Total number of loans Crisis II vs. Crisis I	(2) %Δ Total number of loans Crisis II vs. Pre- crisis	(3) %Δ Total number of loans (lead bank) Crisis II vs. Crisis I	(4) %Δ Total number of loans (lead bank) Crisis II vs. Pre- crisis	(5) %Δ Total amount of loans (lead bank) Crisis II vs. Crisis I	(6) %Δ Total amount of loans (lead bank) Crisis II vs. Pre- crisis
<i>Panel A: All loans</i>						
Deposits/Assets	0.01 [0.10]	0.28** [0.11]	0.42* [0.24]	0.77*** [0.28]	-0.08 [0.23]	0.74* [0.41]
% Revolving lines with Lehman	-1.31** [0.50]	-0.93*** [0.30]	-1.58** [0.60]	-1.28** [0.53]	-2.21*** [0.67]	-0.38 [1.11]
Constant	-0.39*** [0.06]	-0.66*** [0.05]	-0.44*** [0.13]	-0.69*** [0.11]	-0.32** [0.16]	-0.81*** [0.19]
Observations	37	37	37	37	37	37
R-squared	0.26	0.26	0.27	0.23	0.17	0.13
<i>Panel B: Real investment loans</i>						
Deposits/Assets	0.01 [0.18]	0.29 [0.19]	0.49 [0.46]	1.30** [0.48]	-0.06 [0.33]	0.86** [0.38]
% Revolving lines with Lehman	-1.61** [0.66]	-1.17** [0.50]	-1.44 [1.25]	-0.73 [1.09]	-0.99 [1.28]	-0.46 [1.08]
Constant	-0.25** [0.11]	-0.54*** [0.10]	-0.25 [0.25]	-0.68*** [0.20]	-0.34* [0.20]	-0.66*** [0.19]
Observations	37	37	37	37	37	37
R-squared	0.21	0.22	0.09	0.12	0.02	0.05

Note: “Pre-crisis” is 8/06-7/07; “Crisis I” is 8/07-7/08 ; “Crisis II” is 8/08-12/08.

Difficulties in Going from the Micro Estimates to Macro Implications

- A reduction in credit supply by some banks doesn't necessarily imply that there was reduced credit supply to some firms—for example, perhaps borrowers can switch easily across banks.
- Even some firms having trouble getting credit doesn't necessarily imply effects on macro outcomes—for, maybe customers can switch easily across firms.

III. LONG-RUN MACRO EFFECTS OF A FINANCIAL CRISIS (REINHART AND ROGOFF READING)

Reinhart and Rogoff's Thesis

- The aftermaths of major financial crises are awful and long-lasting.

Reinhart and Rogoff's Sample

- 21 major banking crises.
- 6 current; 13 other postwar (5 in advanced countries, 8 in developing); 2 others (Norway 1899, U.S. 1929).

Falls in Real House Prices

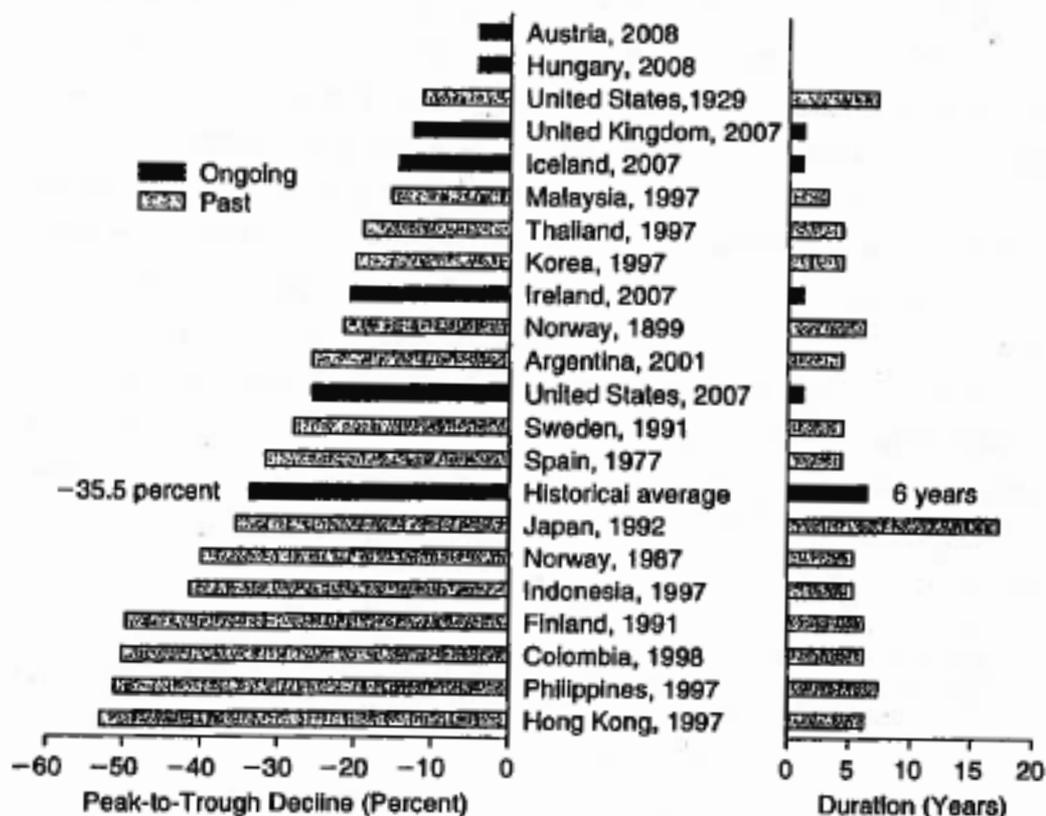


Figure 14.1. Cycles of past and ongoing real house prices and banking crises.

Sources: Appendixes A.1 and A.2 and sources cited therein.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crisis episodes are included, subject to data limitations. The historical average reported does not include ongoing crisis episodes. For the ongoing episodes, the calculations are based on data through the following periods: October 2008, monthly, for Iceland and Ireland; 2007, annual, for Hungary; and Q3, 2008, quarterly, for all others. Consumer price indexes are used to deflate nominal house prices.

Falls in Real Equity Prices

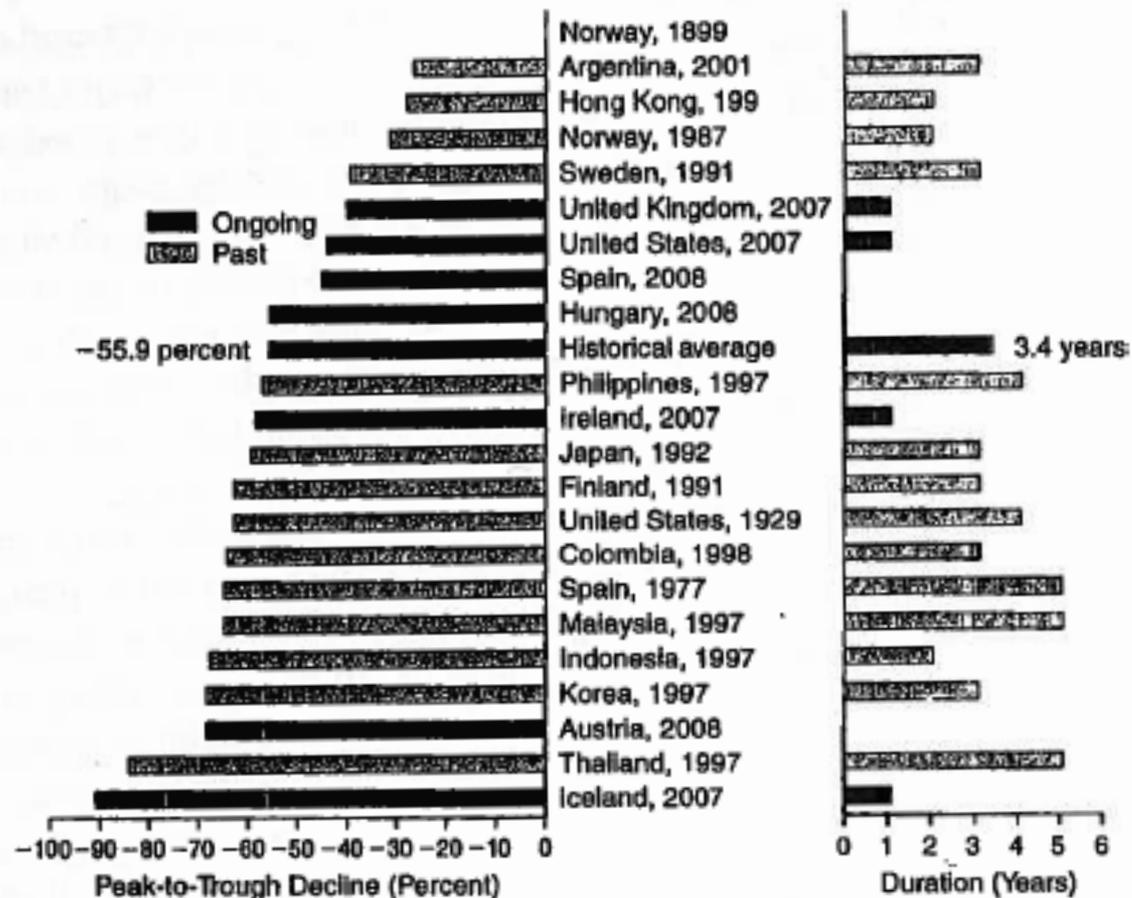


Figure 14.2. Cycles of past and ongoing real equity prices and banking crises.

Sources: Appendixes A.1 and A.2 and sources cited therein.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crisis episodes are included, subject to data limitations. The historical average reported does not include ongoing crisis episodes. For the ongoing episodes, the calculations are based on data through December 2, 2008. Consumer price indexes are used to deflate nominal equity prices.

Rises in Unemployment Rates

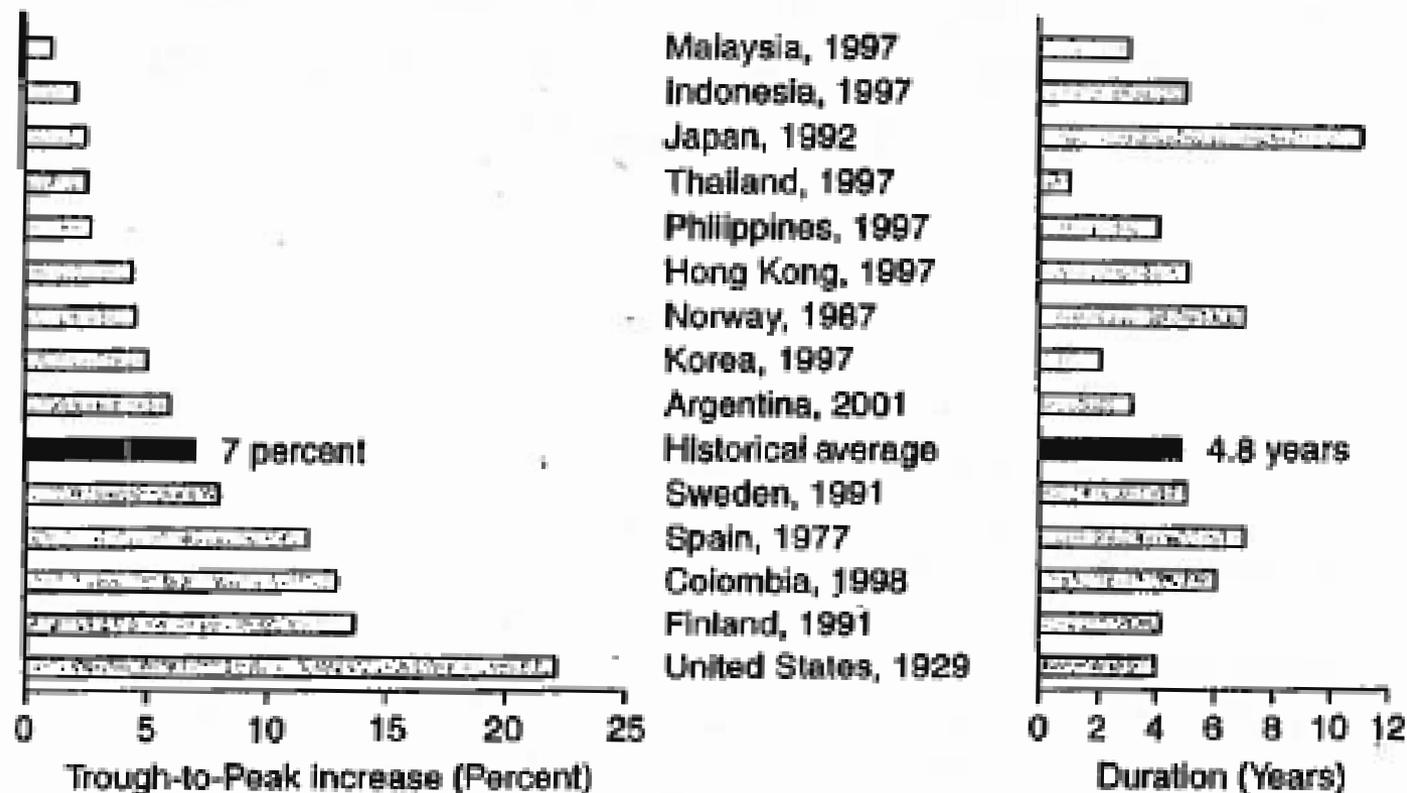


Figure 14.3. Cycles of past unemployment and banking crises.

Sources: Organisation for Economic Co-operation and Development; International Monetary Fund (various years), *International Financial Statistics*; Carter et al. (2006); various country sources; and the authors' calculations.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crisis episodes are included, subject to data limitations. The historical average reported does not include ongoing crisis episodes.

Falls in Real GDP per Capita

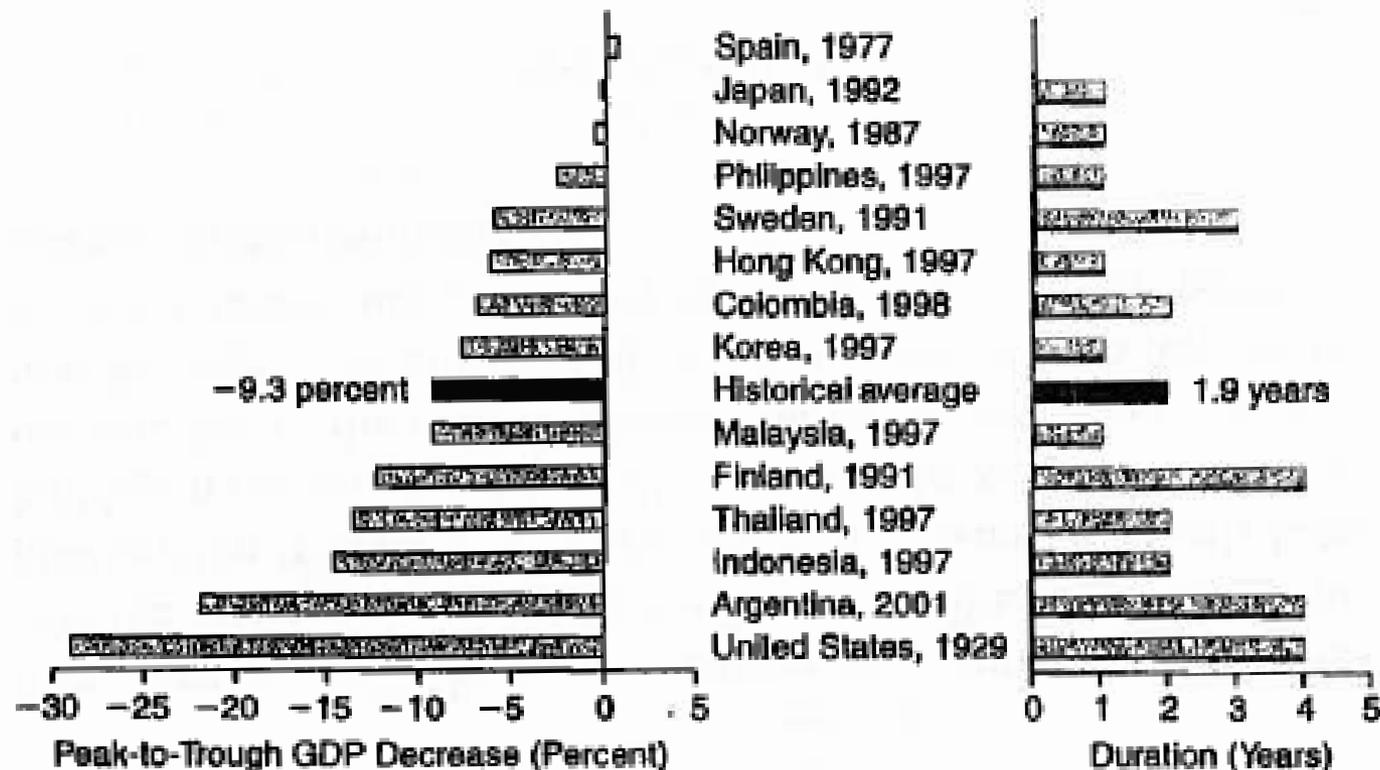


Figure 14.4. Cycles of past real per capita GDP and banking crises.

Sources: Total Economy Database (TED), Carter et al. (2006), and the authors' calculations.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crisis episodes are included, subject to data limitations. The historical average reported does not include ongoing crisis episodes. Total GDP in millions of 1990 U.S. dollars (converted at Geary Khamis PPPs) divided by midyear population.

Time for Real GDP per Capita to Return to Pre-Crisis Level

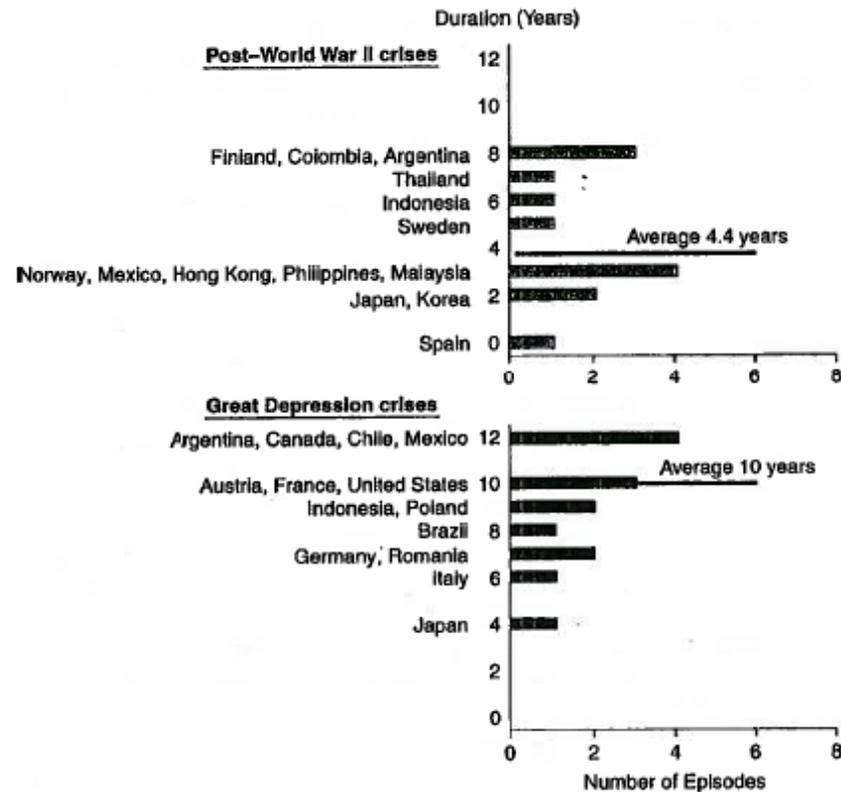


Figure 14.8. The duration of major financial crises:

Fourteen Great Depression episodes versus fourteen post-World War II episodes (number of years for output per capita to return to its precrisis level).

Sources: Appendix A.3 and the authors' calculations.

Notes: The fourteen postwar episodes were those in Spain, 1977; Norway, 1987; Finland, 1991; Sweden, 1991; Japan, 1992; Mexico, 1994; Hong Kong, Indonesia, Korea, Malaysia, the Philippines, and Thailand, all 1997; Colombia, 1998; and Argentina, 2001. The fourteen Great Depression episodes were comprised of eleven banking crisis episodes and three less systemic but equally devastating economic contractions in Canada, Chile, and Indonesia. The banking crises were those in Japan, 1927; Brazil, Mexico, and the United States, all 1929; France and Italy, 1930; and Austria, Germany, Poland, and Romania, 1931.

The precrisis level for the Great Depression was that of 1929.

Increase in Real Government Debt

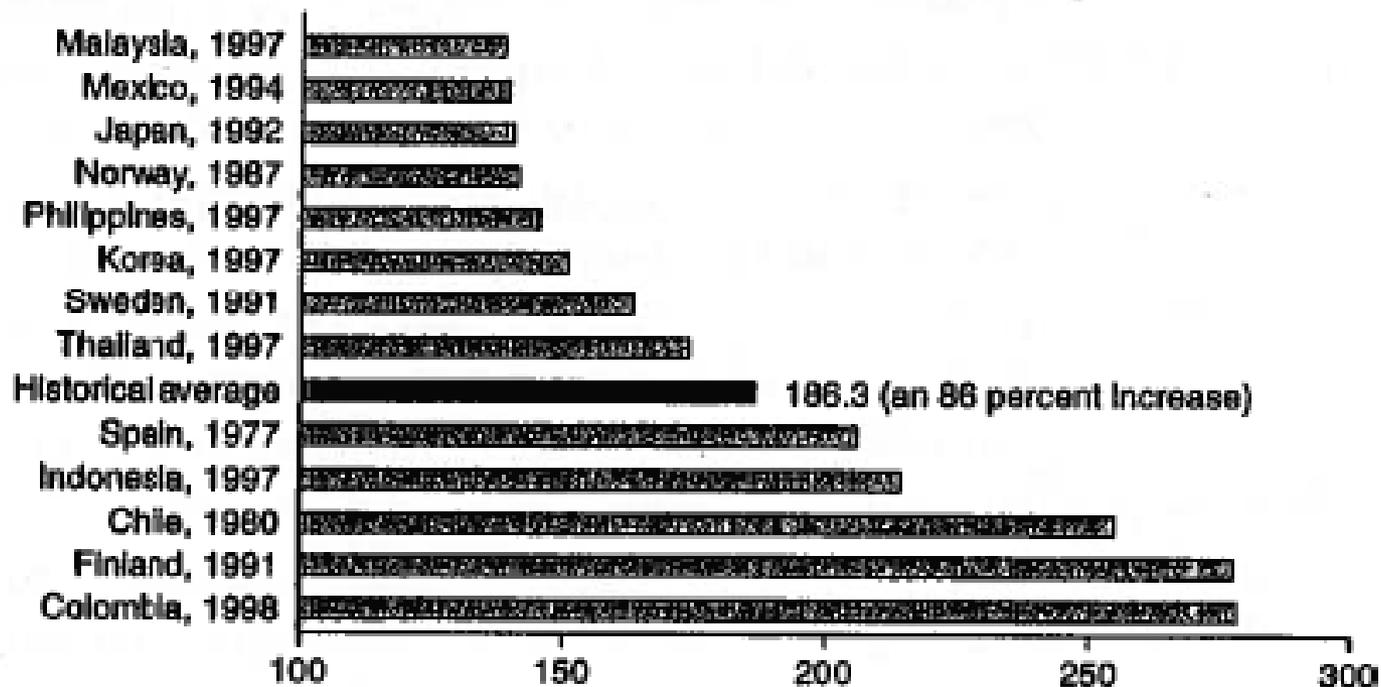


Figure 14.5. The cumulative increase in real public debt in the three years following past banking crises.

Sources: Appendixes A.1 and A.2 and sources cited therein.

Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crisis episodes are included, subject to data limitations. The historical average reported does not include ongoing crisis episodes, which are omitted altogether, because these crises began in 2007 or later, and the debt stock comparison here is with three years after the beginning of the banking crisis. Public debt is indexed to equal 100 in the year of the crisis.

Possible Categories of Explanations

- Long-lasting effect on the level and/or growth rate of potential output.
- Long-lasting effect on aggregate demand.
- It's not a causal effect of the crisis: the economy was operating well above its normal capacity (potential output). The poor economic performance is just the return to normal.
- Maybe it's not a fact at all: How do R&R identify the crises?