

LECTURE 24

POLICY RESPONSES TO FINANCIAL CRISES
APRIL 23, 2018

I. OVERVIEW

- A. Framework
- B. Topics

II. ADDITIONAL EVIDENCE ON THE OUTPUT CONSEQUENCES OF FINANCIAL CRISES

- A. Identifying crises
- B. Average aftermath
- C. Evaluation and omitted variable bias
- D. Variation in aftermaths

III. POLICY AND THE AFTERMATH OF CRISES

- A. Policy space and why it is relevant
- B. Estimates of the contribution of policy space
- C. The policy response
- D. Implications

IV. MONETARY POLICY AND THE BANKING CRISES IN THE GREAT DEPRESSION

- A. Richardson and Troost's question and approach
- B. Is it a good test?
- C. Findings
- D. Could monetary policy have prevented the Great Depression?

LECTURE 24

Policy Responses to Financial Crises



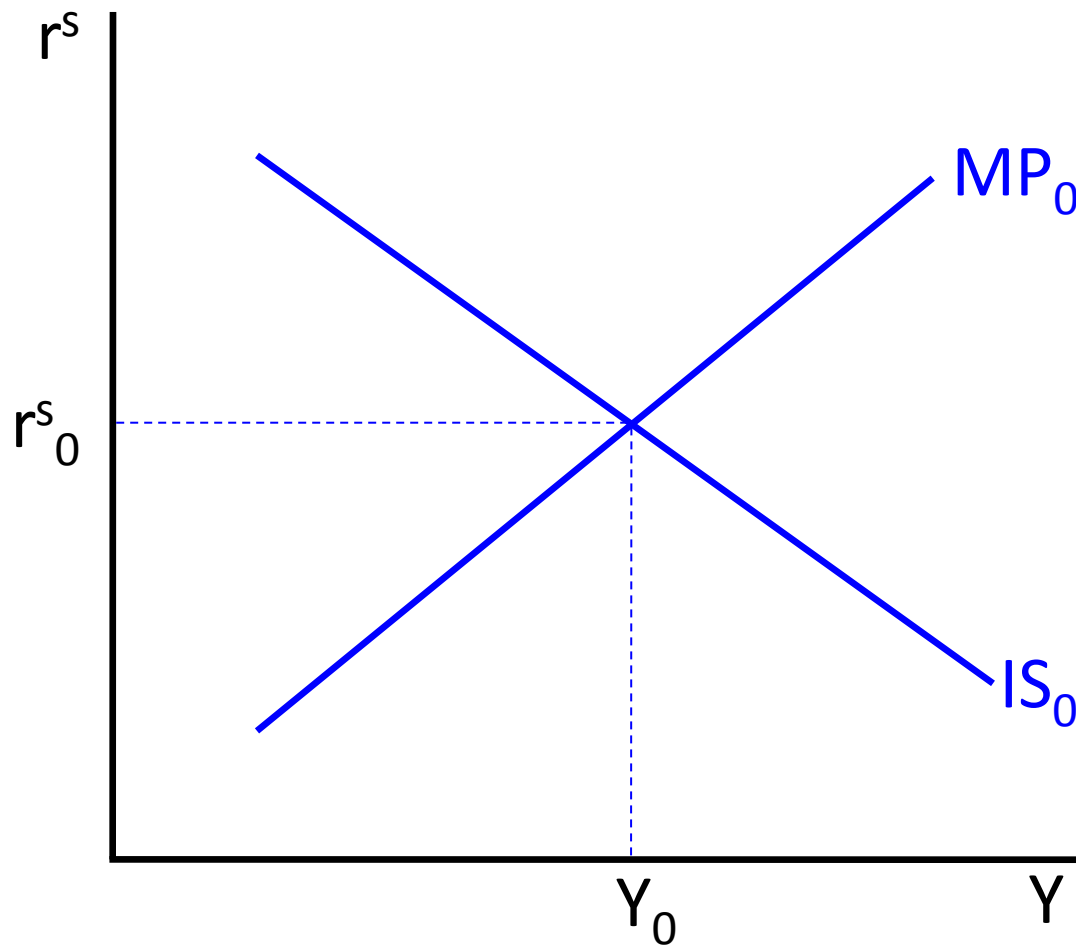
April 23, 2018

Announcements

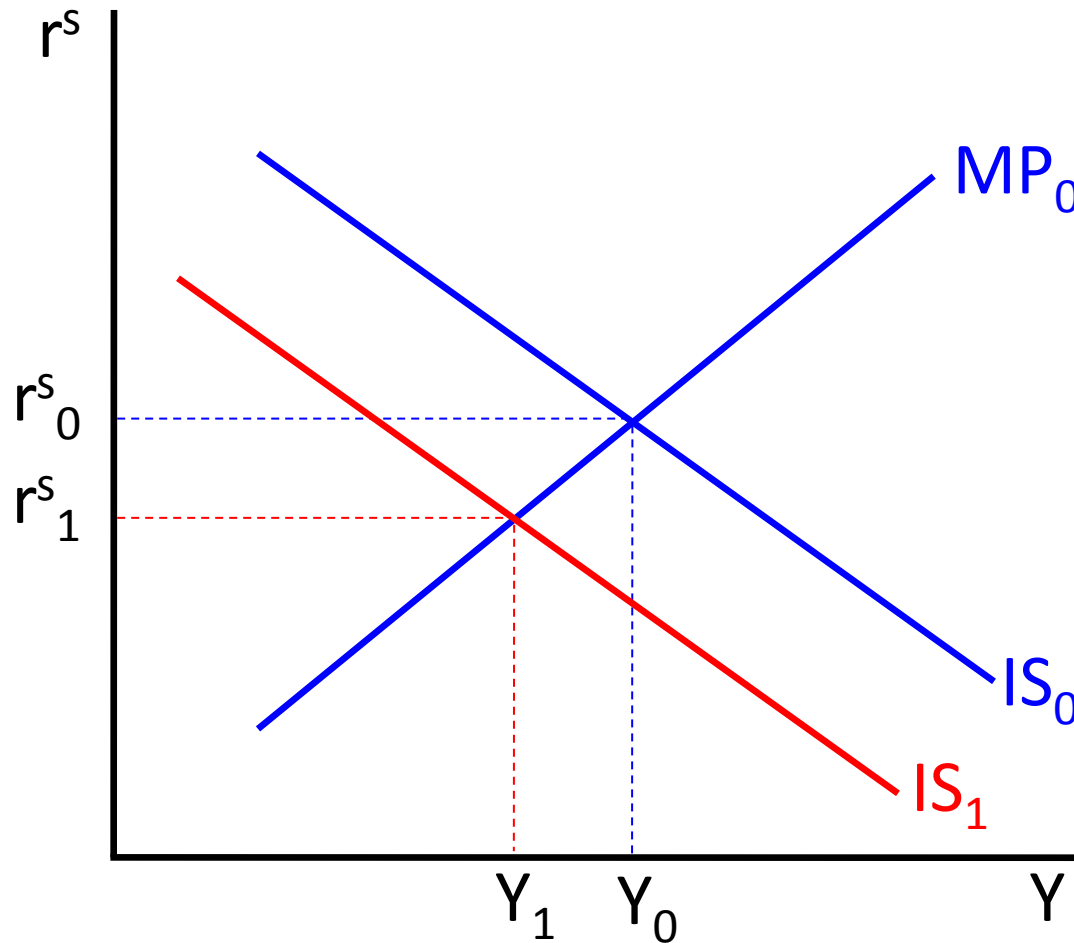
- Hand in Problem Set 4.
 - Suggested answers will be posted on Wednesday.
- You will do course evaluations at the start of lecture next time.
 - Please bring an electronic device (laptop, tablet, or phone).

I. OVERVIEW

Framework: IS/MP with an Interest Rate Spread



A Financial Crisis Increases $r^b - r^s$ at a Given Y .



IS shifts down; r^s and Y both fall.

Topics

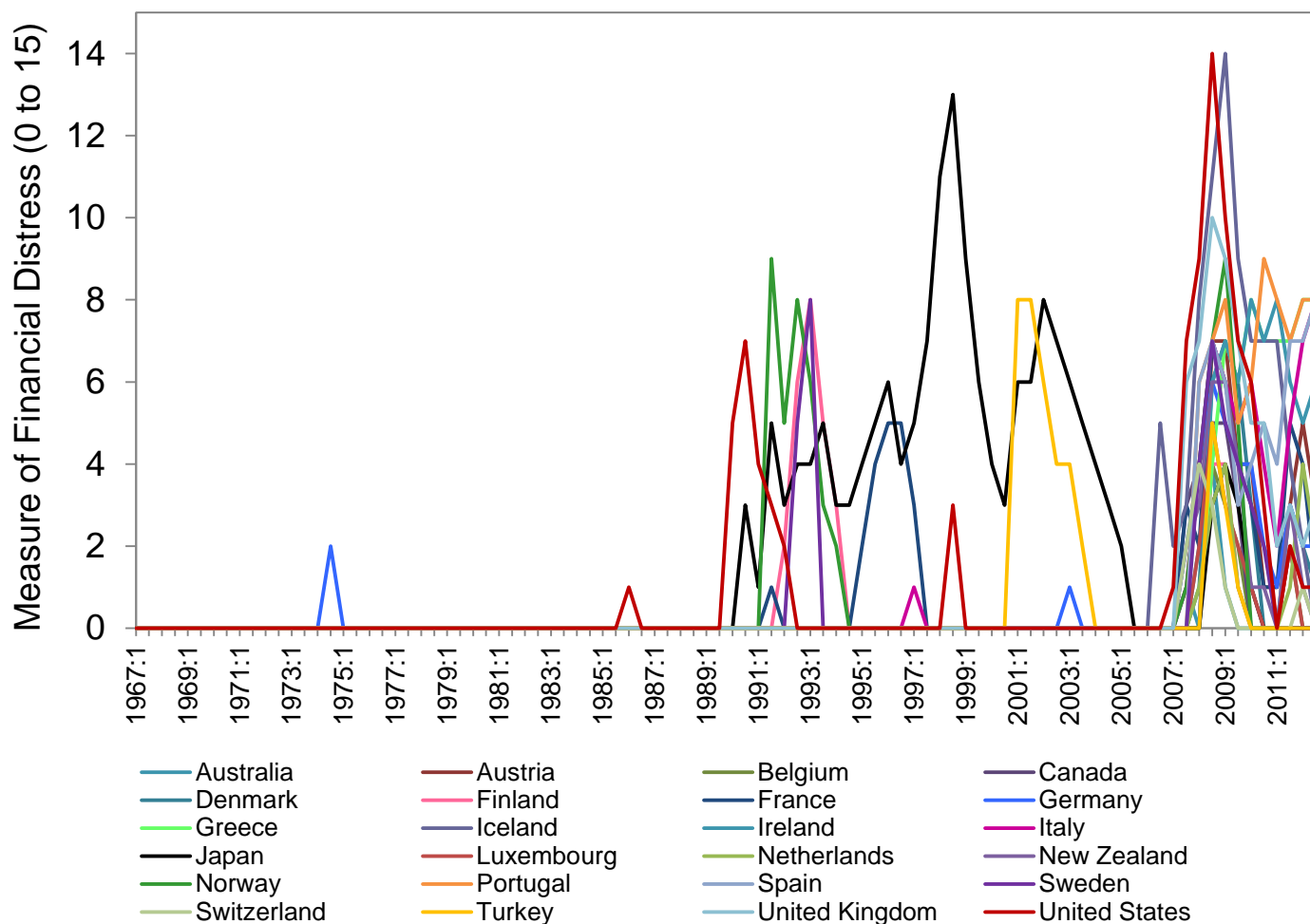
- Additional evidence on the output consequences of financial crises in the postwar era.
- How the ability and willingness to use macroeconomic policy to respond to crises matters to those outcomes. (Romer and Romer)
- Monetary policy and banking crises in the Great Depression. (Richardson and Troost)

II. ADDITIONAL EVIDENCE ON THE OUTPUT CONSEQUENCES OF FINANCIAL CRISES

Identifying Financial Crises

- Various crisis chronologies differ substantially.
- Does it make sense to think a crisis is a 0-1 variable?
- Why not use a statistical indicator?
- How do Romer and Romer define and measure financial distress?
- Strengths and weaknesses of this approach.

New Measure of Financial Distress



Source: Romer and Romer, "New Evidence on the Aftermath of Financial Crises."

Panel Regression Specification

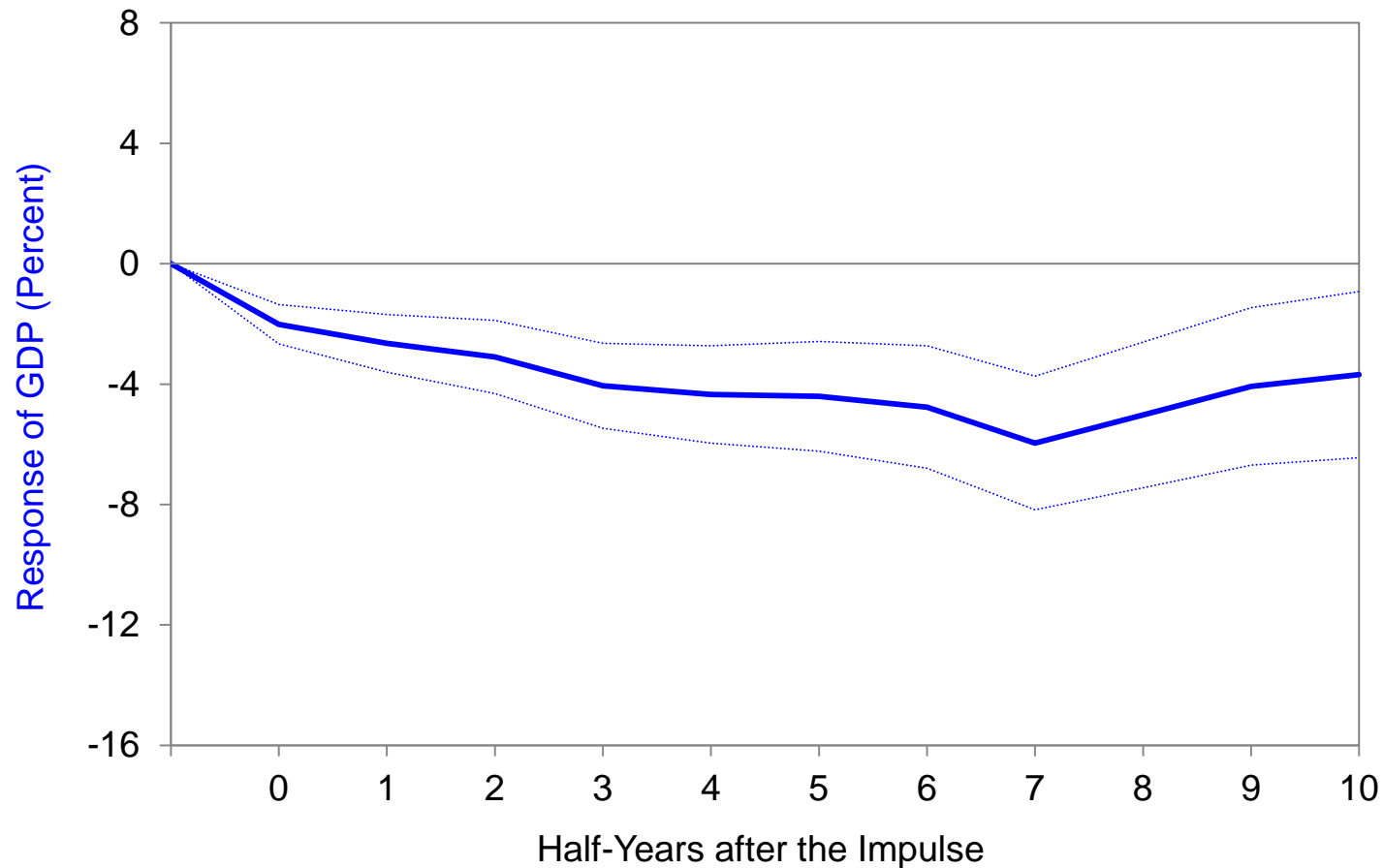
- We have semiannual data on output and financial distress for 24 countries for 45 years.
- Regress output at various horizons after time t on financial distress at t .
- Include time and country dummy variables, so we are only using the cross-section variation.

Panel Regression Specification

$$(1) \quad y_{j,t+i} = \alpha_j^i + \gamma_t^i + \beta^i F_{j,t} + \sum_{k=1}^4 \varphi_k^i F_{j,t-k} + \sum_{k=1}^4 \theta_k^i y_{j,t-k} + e_{j,t}^i$$

- j subscripts index countries and t subscripts index time
- i superscripts denote the horizon (half-years after t)
- $y_{j,t+i}$ is the log of real GDP for country j at time $t+i$
- $F_{j,t}$ is the financial distress variable for country j at time t
- α 's are country fixed effects and γ 's are time fixed effects
- The sequence of β^i coefficients for $i = 1$ to 10 is the response of output to distress. (We multiply by 7 so that it is the response to a “crisis”.)

Behavior of Real GDP after a Financial Crisis



Notes: The figure shows the response to an impulse of 7 in financial distress. Dashed lines show the two-standard-error confidence bands.

Evaluation

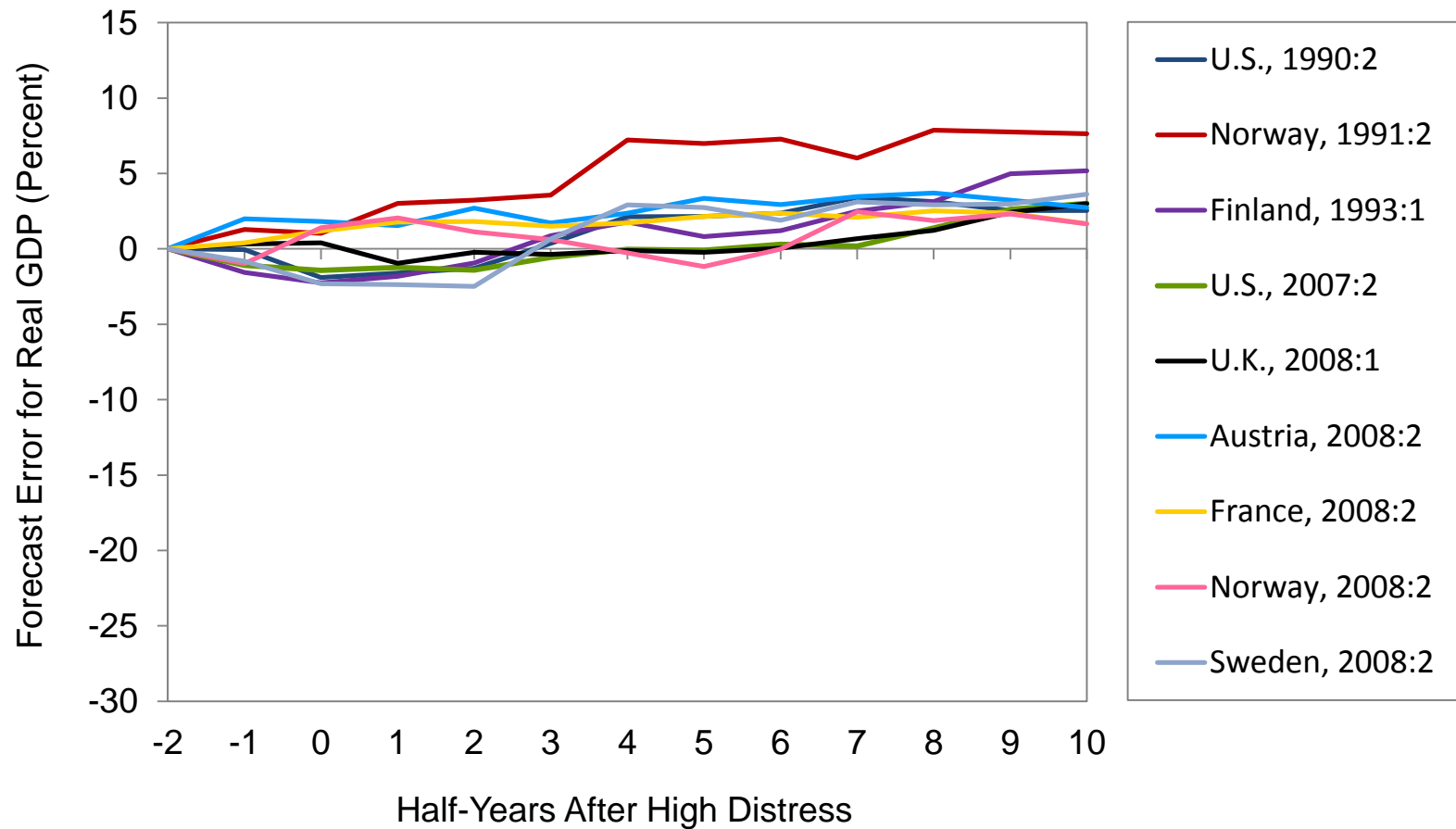
- Omitted variable bias?
- Other issues?

Identifying Variation Across Episodes

- Predict GDP based mainly on lagged GDP up through one half-year before distress hit 7.
- Look at the forecast errors in different episodes.
- Forecast errors show how much worse output did after a crisis than one would have predicted based just on lagged output.

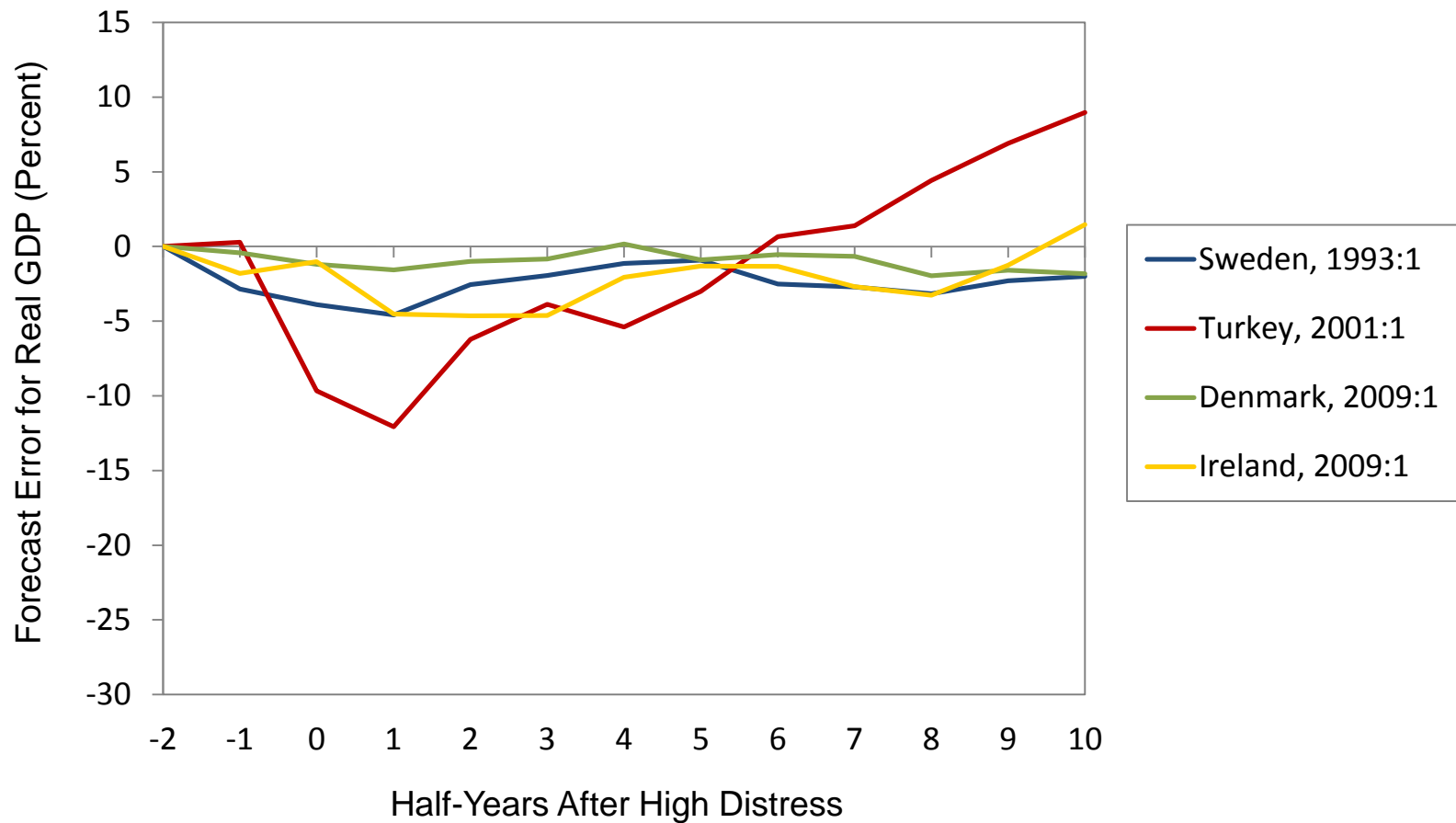
GDP Forecast Errors, Episodes of High Distress

Cases with Small or Positive Forecast Errors



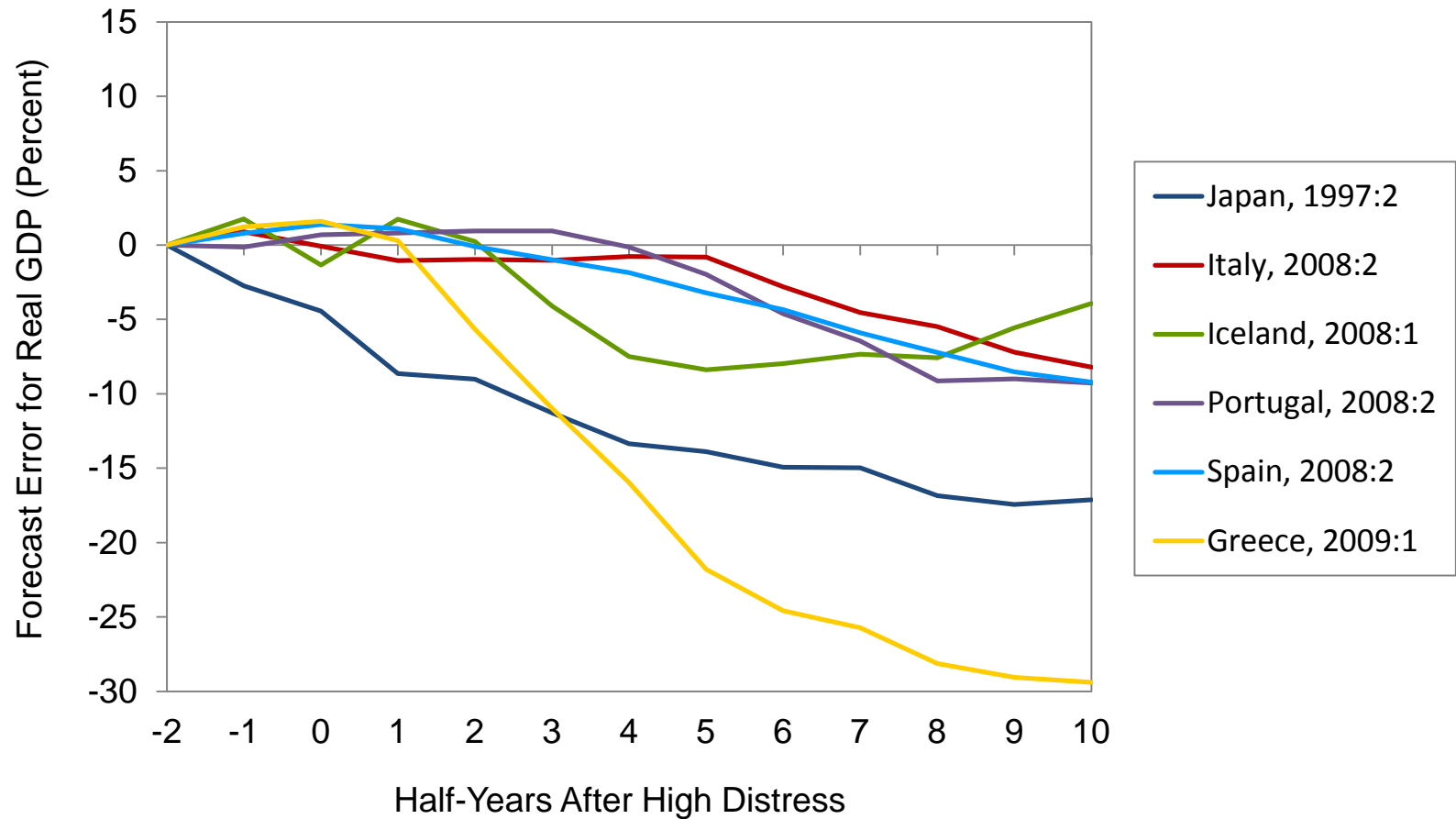
GDP Forecast Errors, Episodes of High Distress

Cases with Moderate Negative Forecast Errors



GDP Forecast Errors, Episodes of High Distress

Cases with Large Negative Forecast Errors



III. POLICY AND THE AFTERMATH OF FINANCIAL CRISES (ROMER AND ROMER)

Romer and Romer's Question

- Does the ability and willingness to use macropolicy account for some/much of the variation we observe in the aftermath of financial crises?
- Expansionary fiscal or monetary policy could help limit financial distress or counteract the impact of a crisis on output.

Romer and Romer's Approach

- Problem with looking directly at outcomes and actual policy response.
- Focus instead on prior policy space.
 - Policy space is the room that policymakers have to maneuver.
- Policy space is determined by fundamental factors.
 - It is also likely to be correlated with the policy response.

Measure of Monetary Policy Space

- **Baseline:** Dummy variable equal to 1 if the policy interest rate is greater than 1.25% in the previous half-year.
- We also consider a range of alternative measures.

Measuring the Contribution of Policy Space

- We run panel regressions as before.
- We allow for an interaction effect between financial distress and prior policy space.

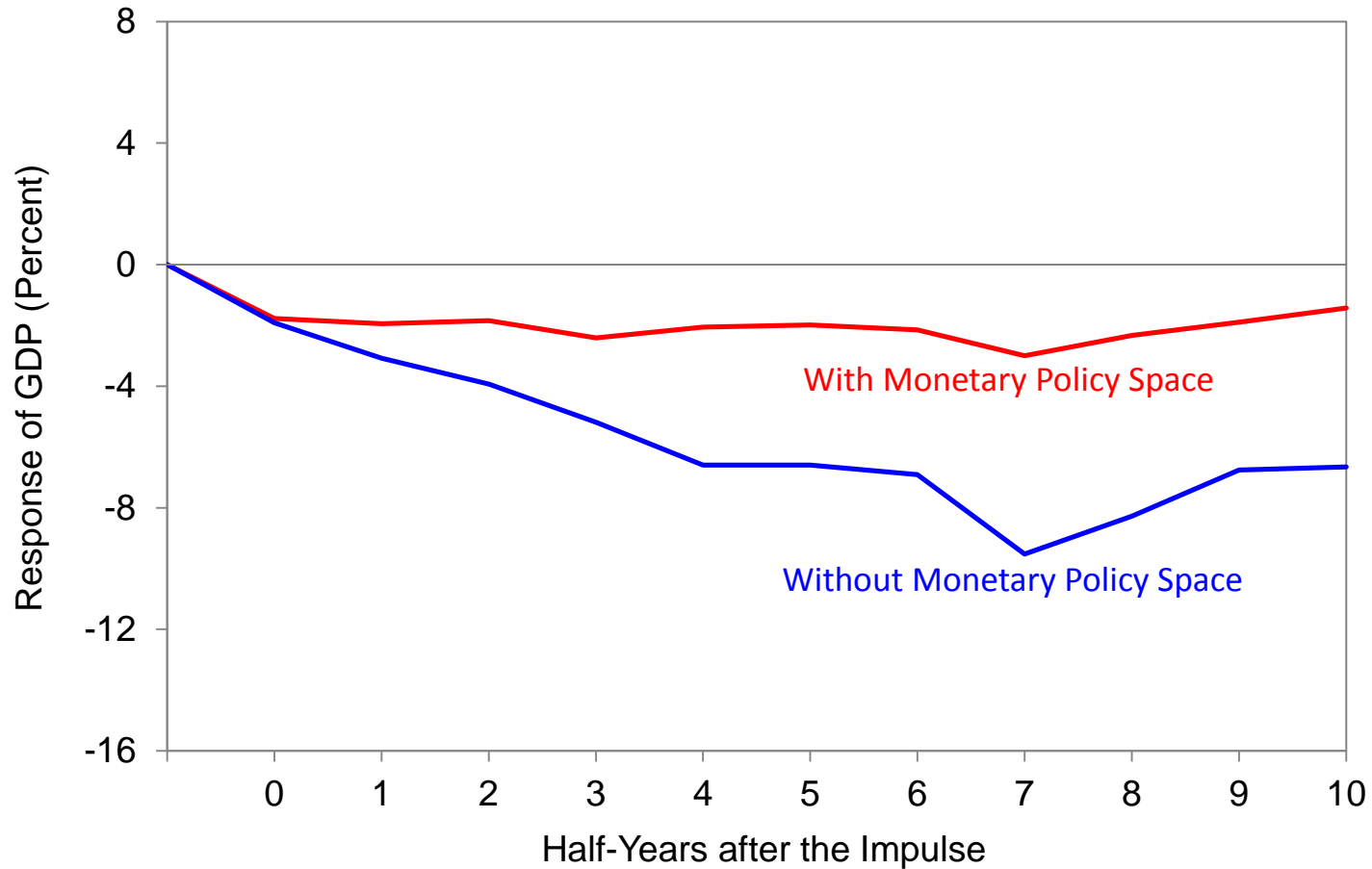
Regression Specification with Interaction Term

$$(2) \quad y_{j,t+i} = \alpha_j^i + \gamma_t^i + \vartheta^i S_{j,t} + \beta^i F_{j,t} + \delta^i (F_{j,t} \cdot S_{j,t}) + \dots + e_{j,t}^i$$

- $y_{j,t+i}$ is the log of real GDP for country j at time $t+i$
- $F_{j,t}$ is the financial distress variable for country j at time t
- $S_{j,t}$ is policy space for country j at time t
- If the coefficient on the interaction term is positive, this implies that the aftermath of a crisis is better when there is policy space.
- The sequence of β^i coefficients is the response of output to distress **without** space, the sequence of $\beta^i + \delta^i$ is the response of output to distress **with** policy space.

Behavior of Real GDP after a Financial Crisis

With and Without Monetary Policy Space

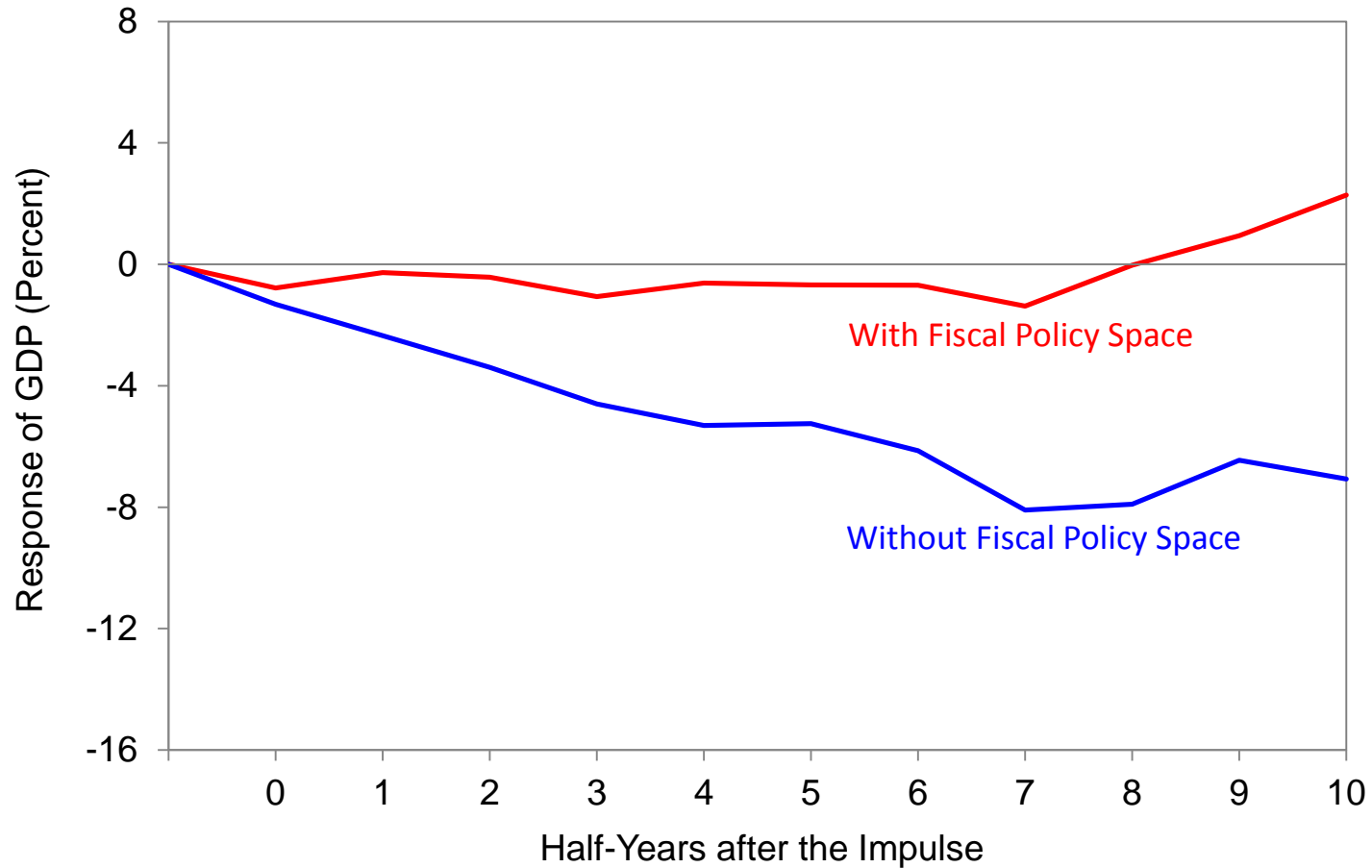


Measures of Fiscal Policy Space

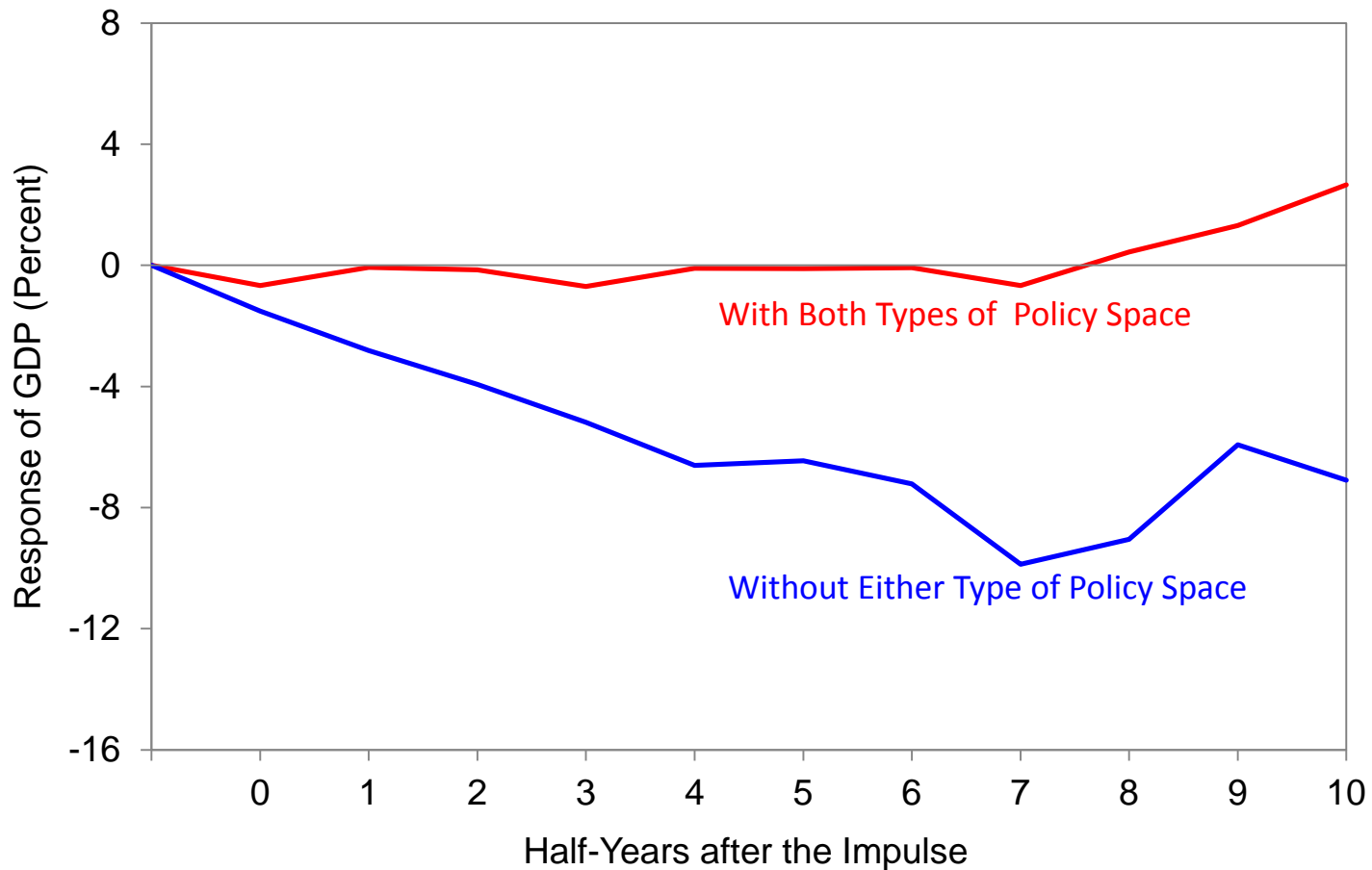
- **Baseline:** Gross Debt/GDP in the previous calendar year (multiplied by -1).
- We also consider a range of alternative measures.

Behavior of Real GDP after a Financial Crisis

With and Without Fiscal Policy Space



Behavior of Real GDP after a Financial Crisis
With *Both* Monetary and Fiscal Policy Space
and Without *Either* Monetary or Fiscal Policy Space



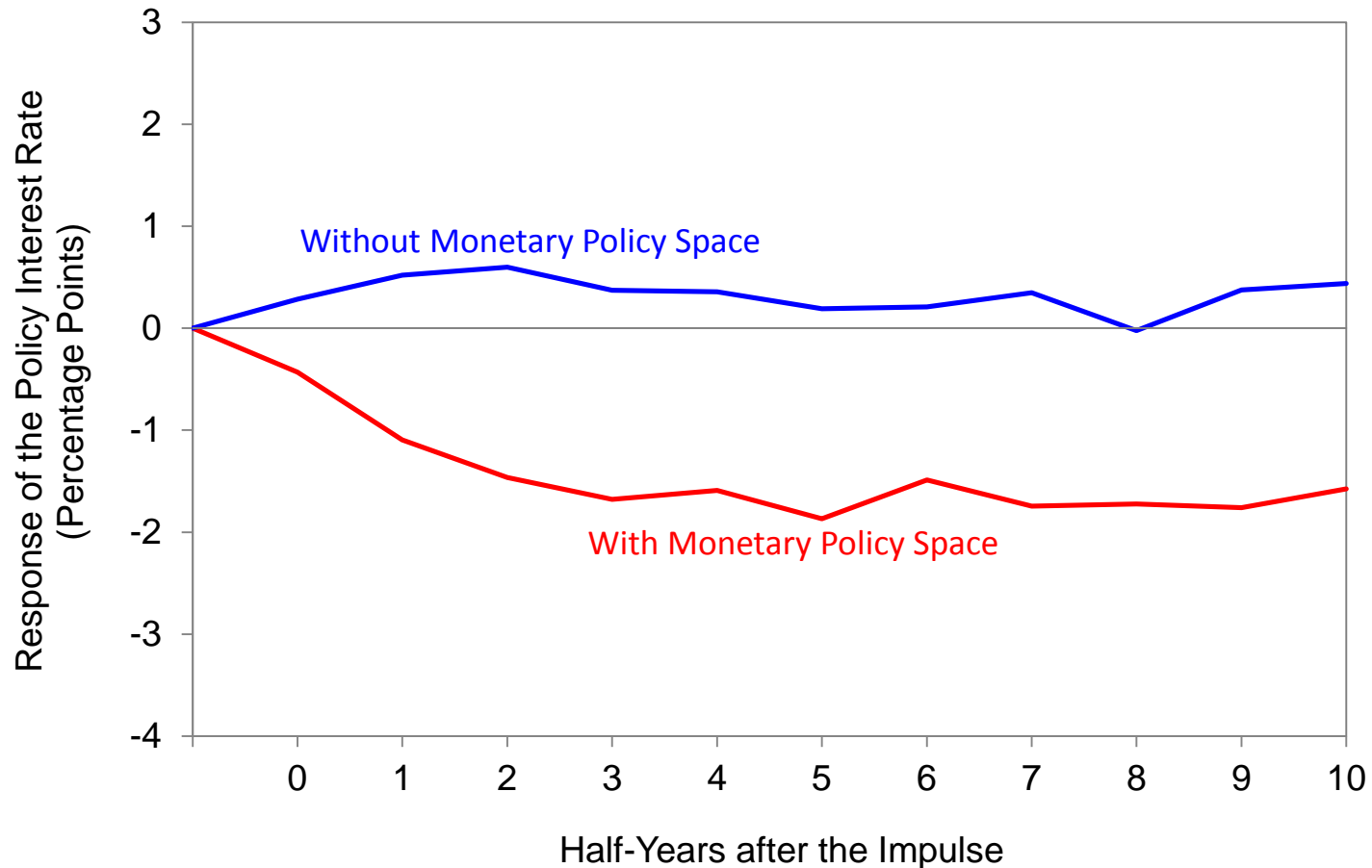
Do Countries with More Policy Space Use Policy More Aggressively?

$$(3) \quad P_{j,t+i} = \alpha_j^i + \gamma_t^i + \vartheta^i S_{j,t} + \beta^i F_{j,t} + \delta^i (F_{j,t} \cdot S_{j,t}) + \dots + e_{j,t}^i$$

- $P_{j,t}$ is a measure of policy.
- Measures of policy:
 - Change in the policy interest rate
 - Change in the high-employment budget surplus

Behavior of the Policy Interest Rate after a Financial Crisis

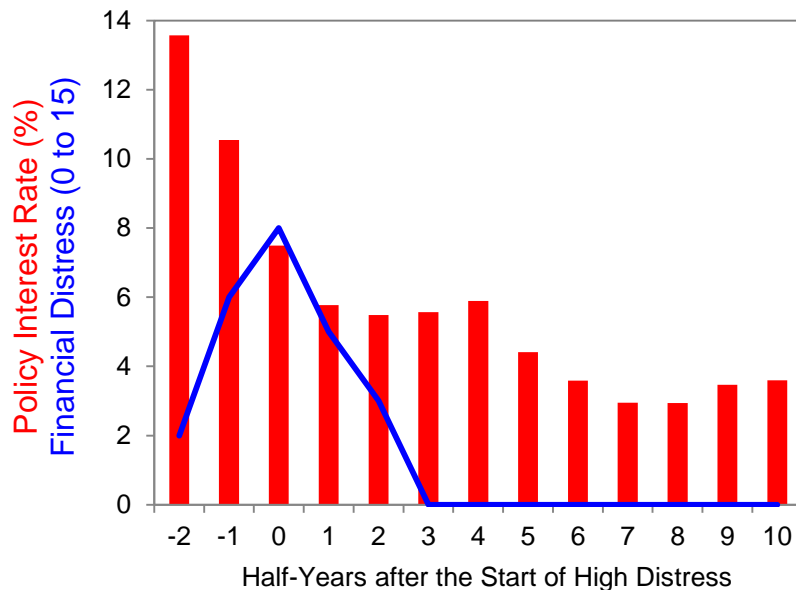
With and Without Monetary Policy Space



Behavior of the Policy Interest Rate in Key Episodes

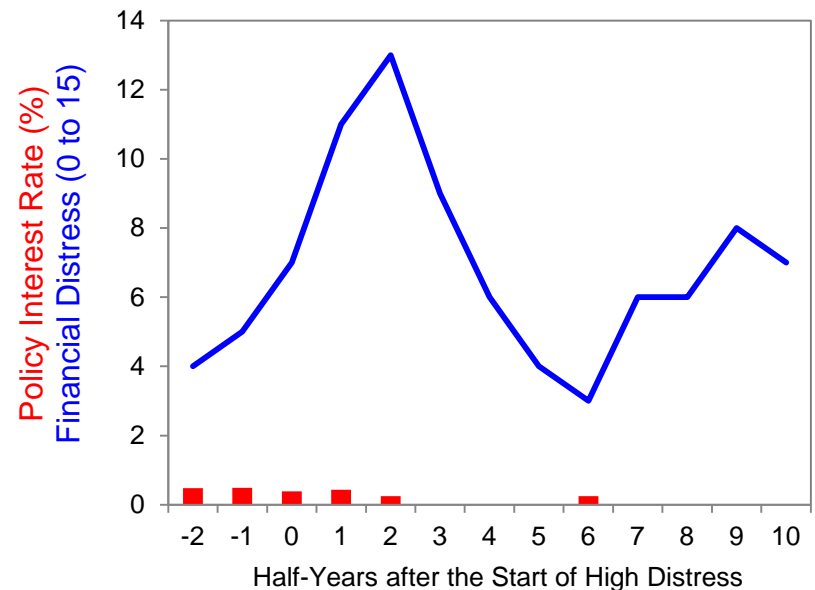
With Space

Finland, 1993:1



Without Space

Japan, 1997:2

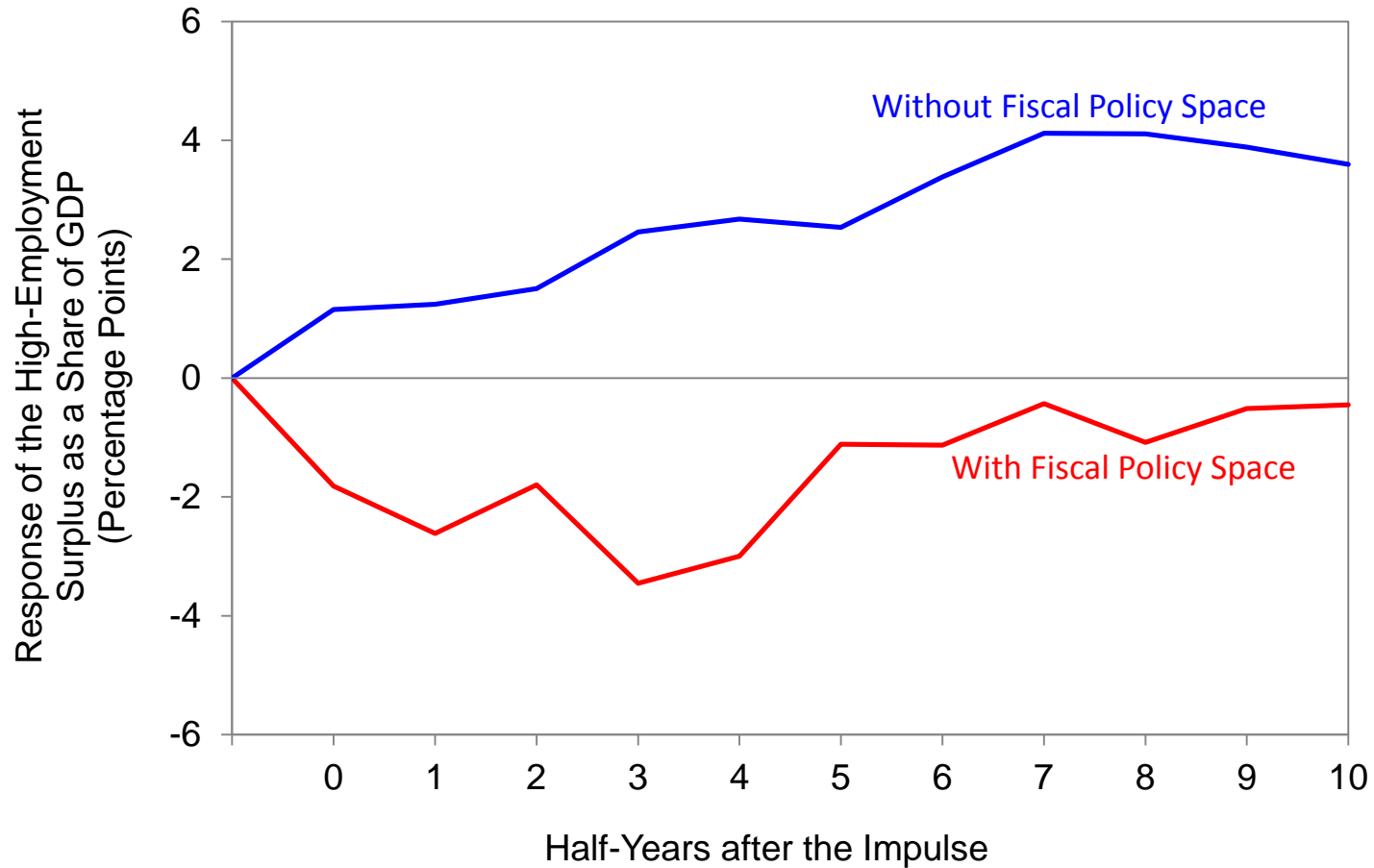


Red: Policy Interest Rate

Blue: Measure of Financial Distress

Behavior of the High-Employment Surplus after a Financial Crisis

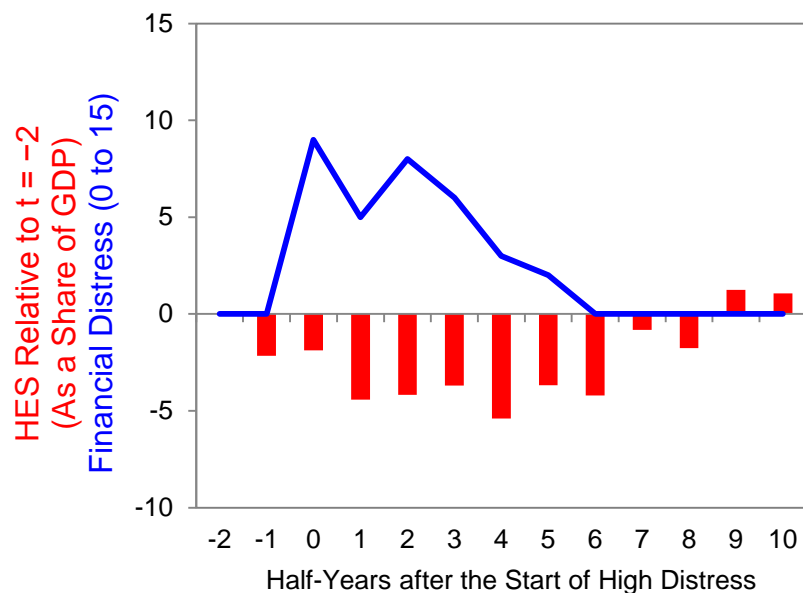
With and Without Fiscal Policy Space



Behavior of the High-Employment Surplus in Key Episodes

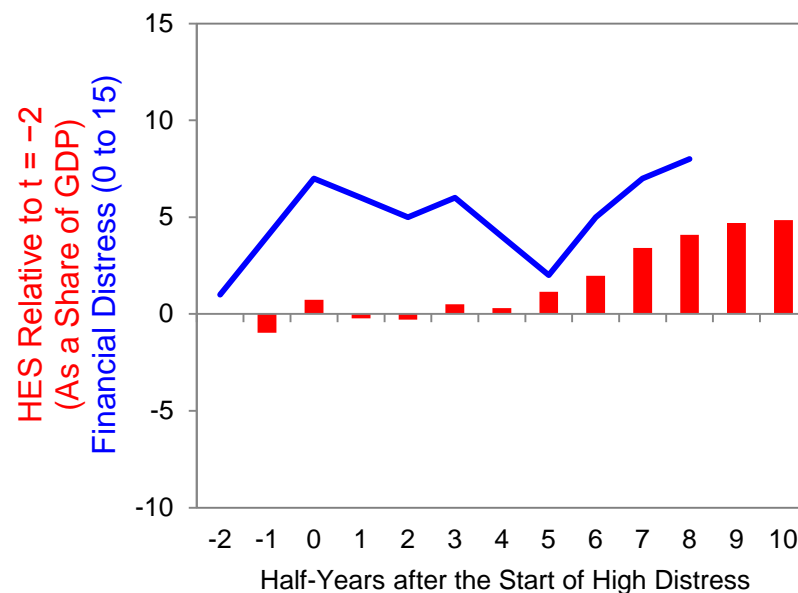
With Space

Norway, 1991:2



Without Space

Italy, 2008:2



Red: Policy Interest Rate

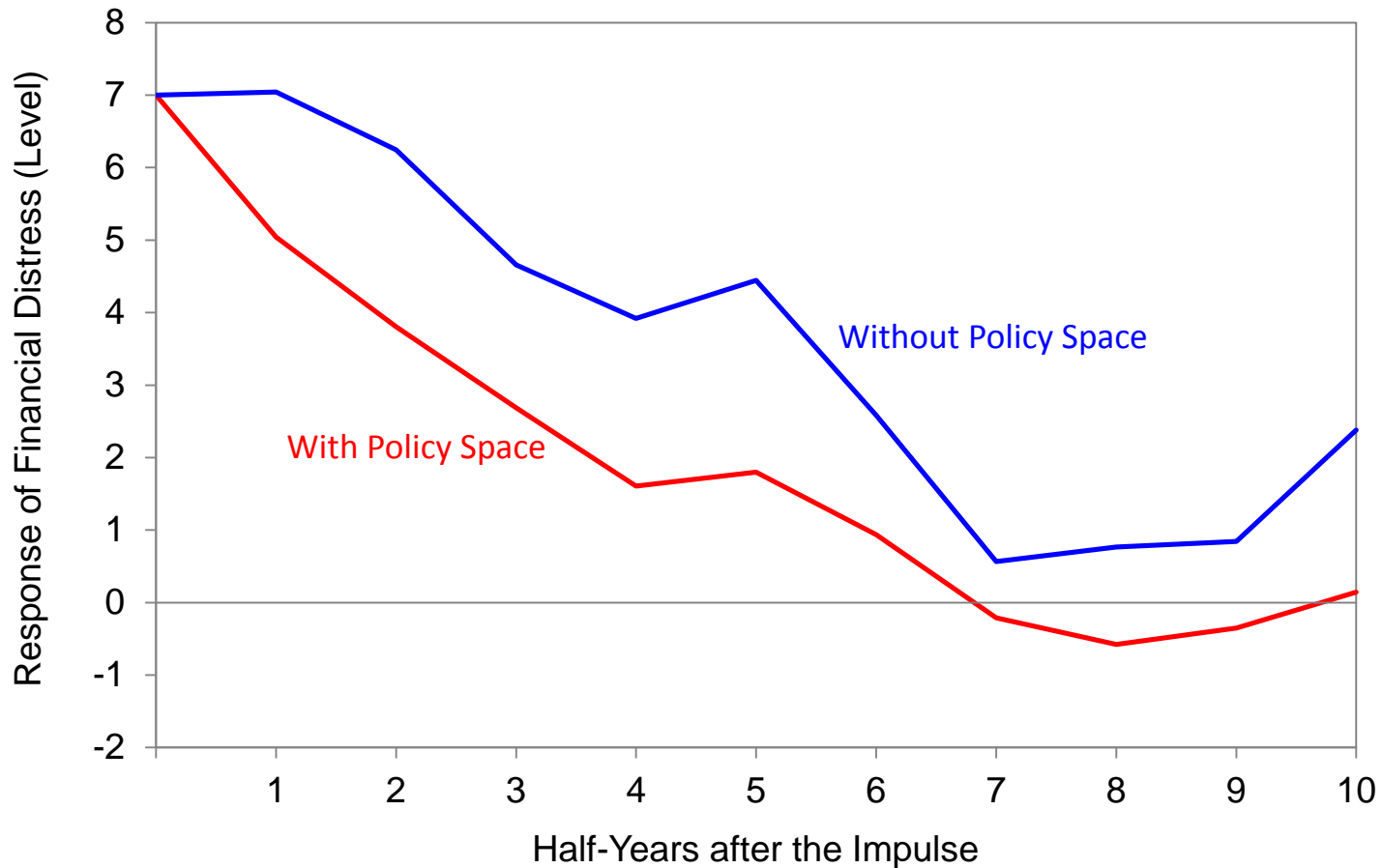
Blue: Measure of Financial Distress

What Do We Learn from This Analysis?

- Policy space matters.
- It appears that the channel through which it matters is the use of policy.
- What you do in response to a crisis affects the aftermath.
- This may have implications for policy in normal times.
- Other possible channels by which space might matter?

Behavior of Financial Distress after a Financial Crisis

With *Both* Monetary and Fiscal Policy Space and Without *Either* Monetary or Fiscal Policy Space



IV. MONETARY POLICY AND BANKING CRISES IN THE GREAT DEPRESSION (RICHARDSON AND TROOST)

Banking Panics in the Great Depression

- Four waves—the first in late fall of 1930.
- Huge drop in the money supply.
- Roughly $\frac{1}{2}$ of banks in existence in 1929 are gone by 1933.

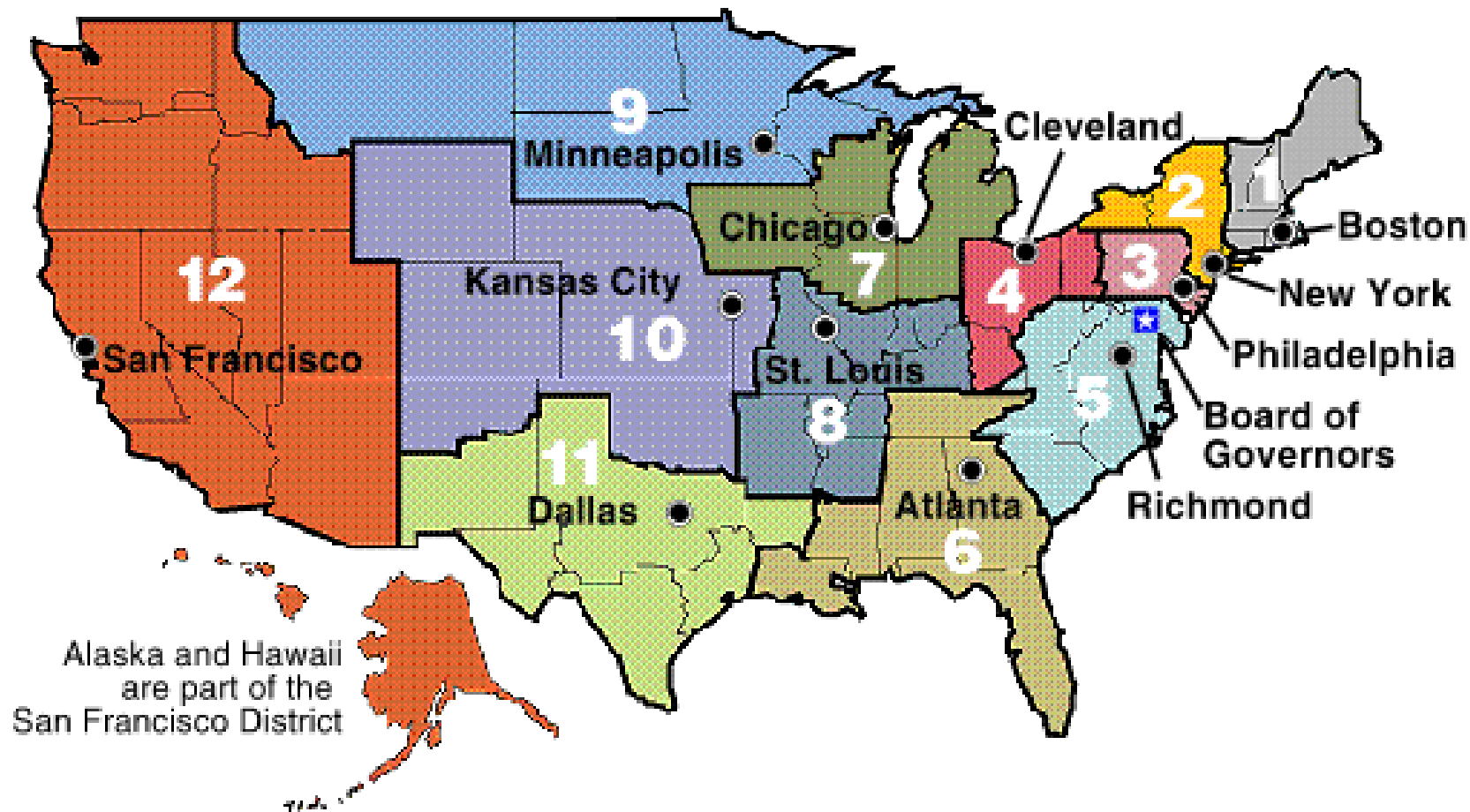
Richardson and Troost's Question

- Would monetary expansion have helped stop the banking panics during the Great Depression?
- This is related to the question of whether banks were merely illiquid or insolvent.

Richardson and Troost's Natural Experiment

- Mississippi (MS) was split between 2 Federal Reserve districts.
- Districts had very different approaches to panics *before* the Great Depression.
- In December 1930 there was a panic in MS.
- Can look for differences in bank failures in the two halves of MS.

Federal Reserve Districts



Differing Beliefs about Responding to Panics

- Federal Reserve Bank of Atlanta believed the Fed should serve as a lender of last resort.
 - Responded aggressively to panics in the 1920s with infusions of cash.
- Federal Reserve Bank of St. Louis believed in the real bills doctrine.
 - Increase the money supply in good times, decrease it in bad times.
 - Be tougher in discounting when times are bad.

Mississippi Banking Panic

- November 7, 1930 Caldwell and Co. collapsed in Nashville.
- Bank of the United States (in NY) closed due to scandal December 11, 1930.
- Panic breaks out in Mississippi on Dec. 19, 1930.
- Seems to be due to micro shocks (fraud, suicide of a bank president) in a climate of unease.

Different Policy Responses

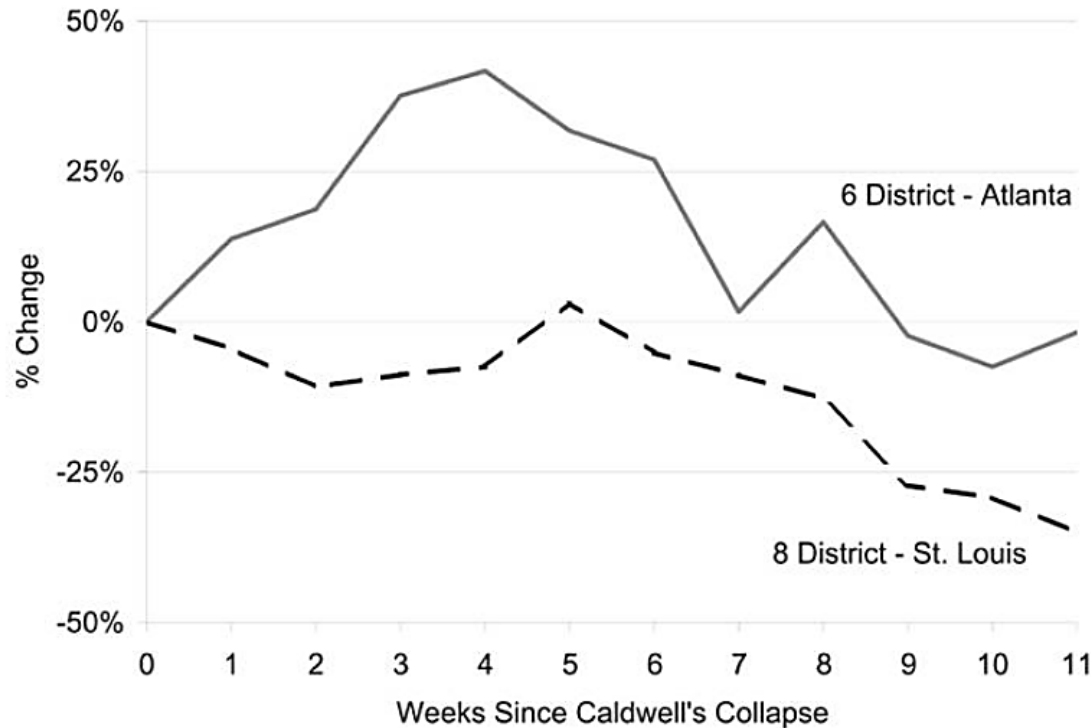


FIG. 2.—Discount response after the collapse of Caldwell, aggregate discounts each week as a percentage of initial level. Source: See Section II.

FRB of Atlanta pumps in liquidity; FRB of St. Louis contracts liquidity.

Essence of Richardson and Troost's Test

- Panic is statewide.
- The southern half of state gets liquidity infusion, northern half does not.
- See if there are more bank failures in the north.

Is Their Test Good?

- Worry that two halves of the state were different for other reasons.
- Worry that banks in the north were more directly linked to the trouble at Caldwell and Co.
- Worry that banks in north started out weaker.

Were the Two Halves of MS Otherwise Similar?

TABLE 3
CHARACTERISTICS OF COUNTIES IN MISSISSIPPI IN 1930

	6TH FEDERAL RESERVE DISTRICT (Atlanta)				8TH FEDERAL RESERVE DISTRICT (St. Louis)			
	All		Near Border		Near Border		All	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Population (1,000s)	22.4	14.4	28.2	17.7	30.4	17.2	26.8	14.2
Persons per square mile	37.4	19.7	41.5	20.3	51.4	21.5	49.3	18.6
Urban population share (%)	14.2	22.3	12.2	22.8	12.5	11.1	9.3	10.8
Black population share (%)	43.4	18.2	49.5	18.2	56.1	18.1	49.6	23.3
Number of manufacturing establishments	20.1	20.0	25.6	24.6	27.1	14.1	25.2	15.9
Average annual manufacturing wage (\$)	754.8	150.6	779.2	129.3	753.7	182.9	711.2	178.7
Net sales, retail stores, annual per capita (\$)	190.0	76.8	188.2	91.7	185.0	51.5	175.1	54.0
Fraction of population in labor force (%)	38.8	6.2	41.3	6.3	42.9	7.6	42.4	8.0
Unemployment rate (%)	1.8	2.0	1.0	1.1	.6	.4	.5	.4
Fraction of farm acres in cotton (%)	57.5	26.4	68.0	18.2	77.7	14.1	79.7	11.9
Fraction of farm acres with crop failures (%)	3.3	6.4	3.8	7.3	1.1	.5	1.1	.8
Farm mortgage debt as a percentage of farm value	33.2	5.3	35.3	4.2	41.2	7.2	41.6	6.1
Interest charges as a percentage of mortgage debt	7.0	.5	6.9	.4	6.9	.5	6.9	.4

SOURCE.—Historical, Demographic, Economic, and Social Data: The United States, 1790–1970 (<http://www.icpsr.umich.edu/icpsrweb/ICPSR/>). For comparisons of additional characteristics, see Richardson and Troost (2006).

Economic characteristics were similar in the two halves of Mississippi.

Where Were Banks Stronger?

TABLE 7
ASSET QUALITY AT SUSPENDED BANKS IN MISSISSIPPI, JANUARY 1929
THROUGH MARCH 1933

	GOOD		PROBLEMATIC	
	Number	%	Number	%
6th Atlanta:				
1. Panic	3	25.0	9	75.0
2. Nonpanic	2	8.0	23	92.0
8th St. Louis:				
3. Panic	37	55.2	30	44.8
4. Nonpanic	12	38.7	19	61.3

Quality of bank assets in suspended banks higher in the St. Louis half of the state.

Banks Suspensions in the Two Halves of MS

TABLE 4
BANK SUSPENSIONS AND LIQUIDATIONS

Begin July 1		End June 30	PERCENTAGE OF BANKS SUSPENDING			PERCENTAGE OF BANKS LIQUIDATING		
			All (1)	Federal Reserve District		All (4)	Federal Reserve District	
				6th Atlanta (2)	8th St. Louis (3)		6th Atlanta (5)	8th St. Louis (6)
1929	to	1930	4.8	7.1	3.0	4.5	7.1	2.4
1930	to	1931	28.9	14.2	39.5	13.6	7.1	18.6
1931	to	1932	13.2	14.9	11.8	8.0	7.9	8.1
1932	to	1933	7.7	7.5	7.9	7.3	6.5	7.9
1933	to	1934	.9	.0	1.7	.9	.0	1.7
1929	to	1934 ^a	49.8	38.7	59.2	30.9	26.8	34.4

SOURCE.—*Rand McNally Bankers Directory* and National Archives and Records Administration Record Group 82. See Section II and Richardson (2006, 2007a, 2007b, 2008) for details.

^a The last row indicates the percentage of banks operating on July 1, 1929, that either suspended or liquidated by June 30, 1933.

Many more banks suspend and liquidate in the part of the state in the 8th district (St. Louis).

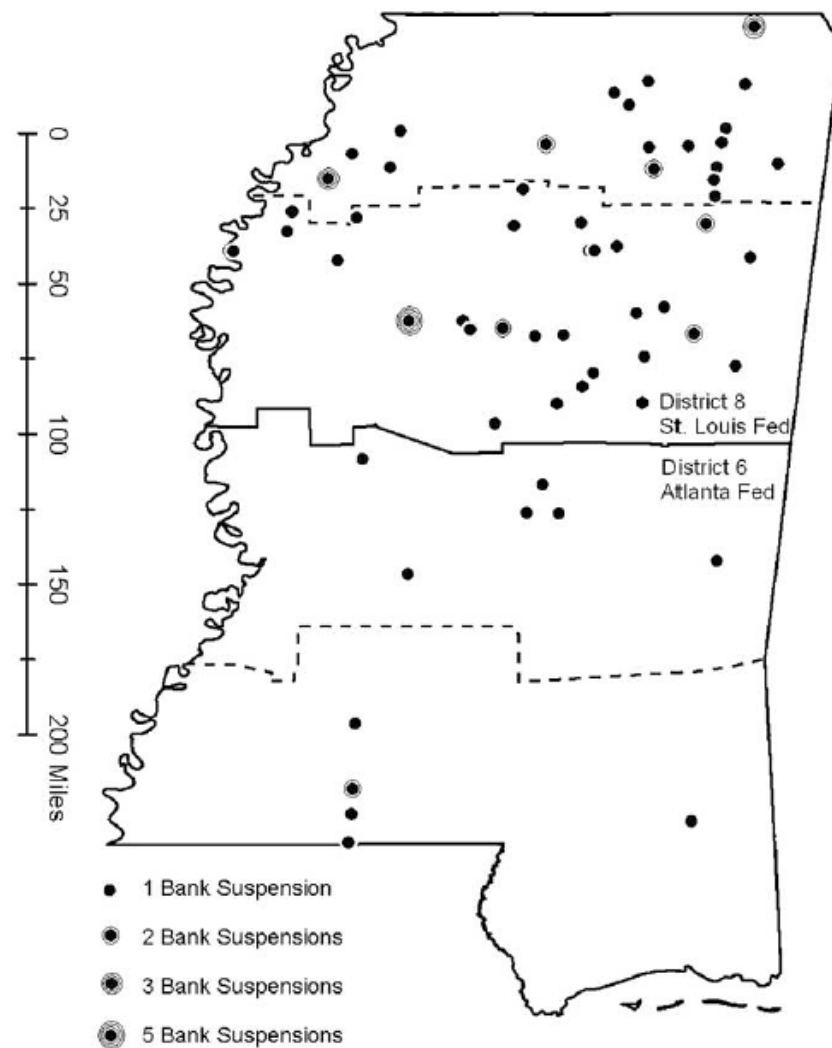


FIG. 1.—Mississippi's division into Federal Reserve districts and bank suspensions between October 1930 and March 1931. Source: See Section II. The solid line represents the Federal Reserve district border. The dotted lines enclose the counties for which at least half the area lies within 1 degree latitude of the district border.

Decline in Lending after the Panic

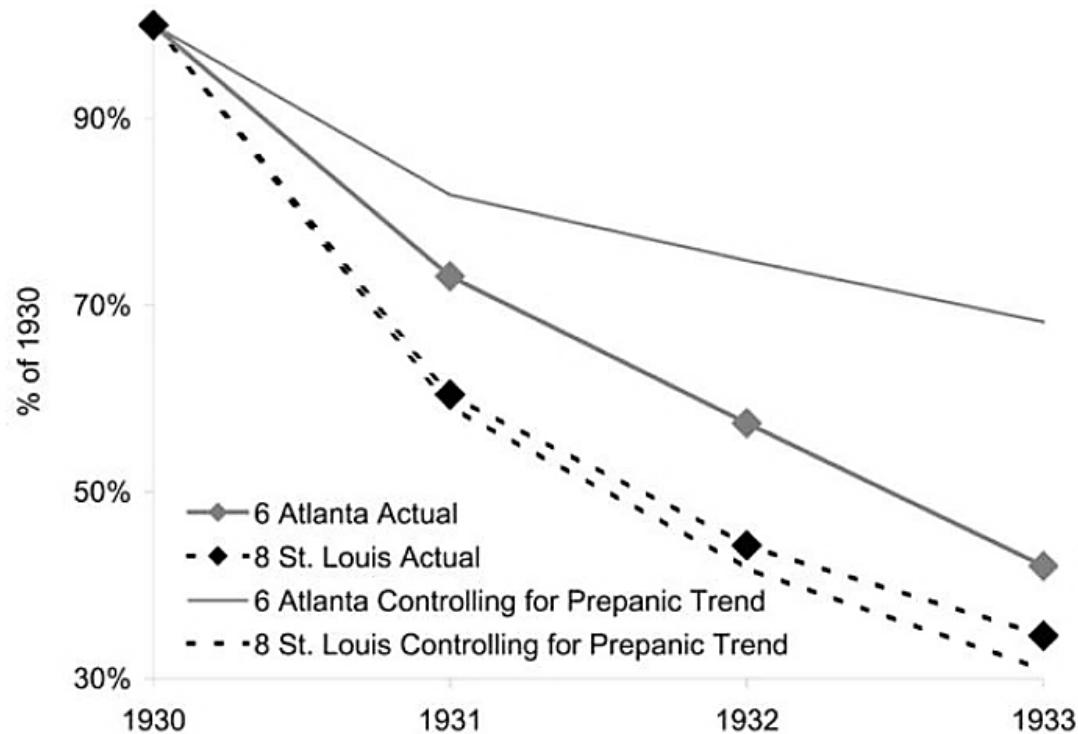


FIG. 6.—Comparing consequences of the banking panics in the 6th and 8th Districts. *A*, Total deposits as a percentage of total deposits in June 1930. *B*, Total loans and discounts as a percentage of the total in June 1930.

Lending declined more in the St. Louis half of the state.

Real Outcomes in the Two Halves of MS

TABLE 8
DECLINE IN WHOLESALE TRADE

	FEDERAL RESERVE DISTRICT	
	6th Atlanta	8th St. Louis
Wholesale firms:		
Number in 1929	783	930
Number in 1933	641	607
$\Delta\%$	-18.1	-34.7
Net sales:		
\$1,000s in 1929	140,776	245,486
\$1,000s in 1933	59,513	83,727
$\Delta\%$	-57.7	-65.9

SOURCE.—*Census of American Business*, 1929 and 1933.

Trade appears to decline more in the 8th district part of the state.

Implications of the Findings

- At least the 1930 panic seems to be due to illiquidity.
- Suggests that Federal Reserve action would have been helpful.
- Monetary policy can help stem a financial crisis and lead to better aftermaths.
- Could the Fed could have responded aggressively on a national scale?

V. CONCLUSIONS

Policy and Crises

- Monetary and fiscal policy can greatly mitigate the negative aftermath of a crisis.
- May work through helping the economy directly or through reducing financial distress.