Economics 210A
Spring 2015

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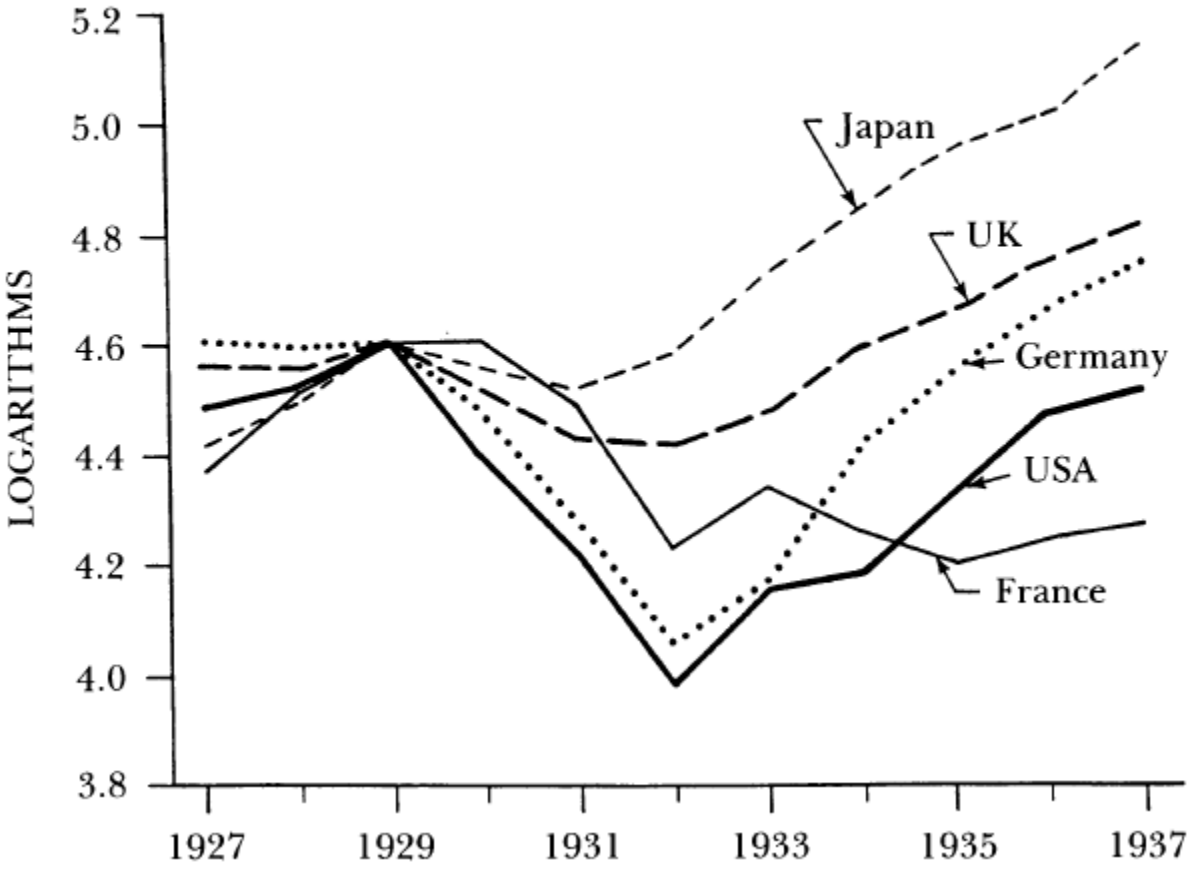
LECTURE 13
The Great Depression

April 22, 2015

I. Overview

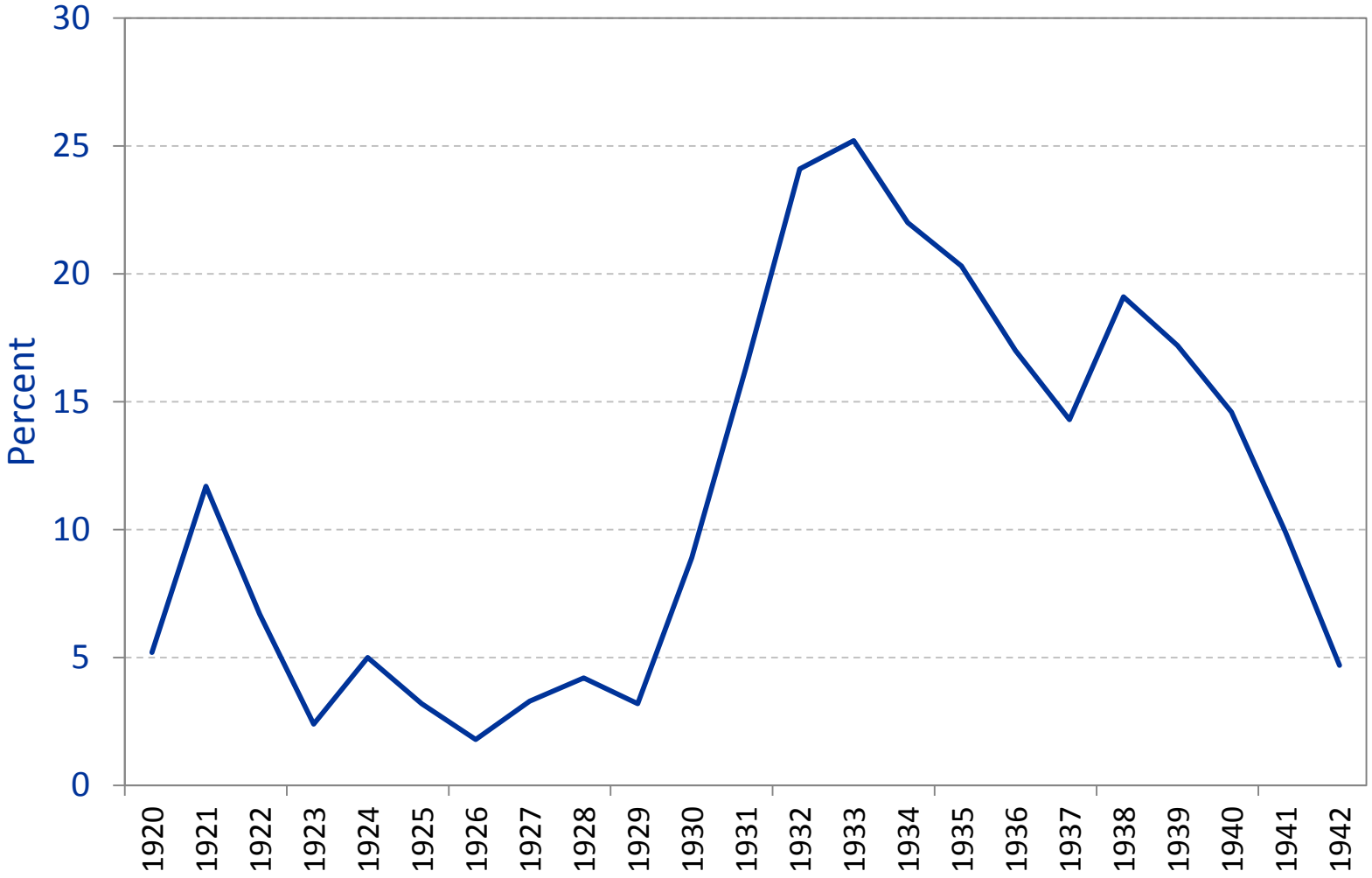
Figure 1

Annual Industrial Production in Five Countries, 1927–1937

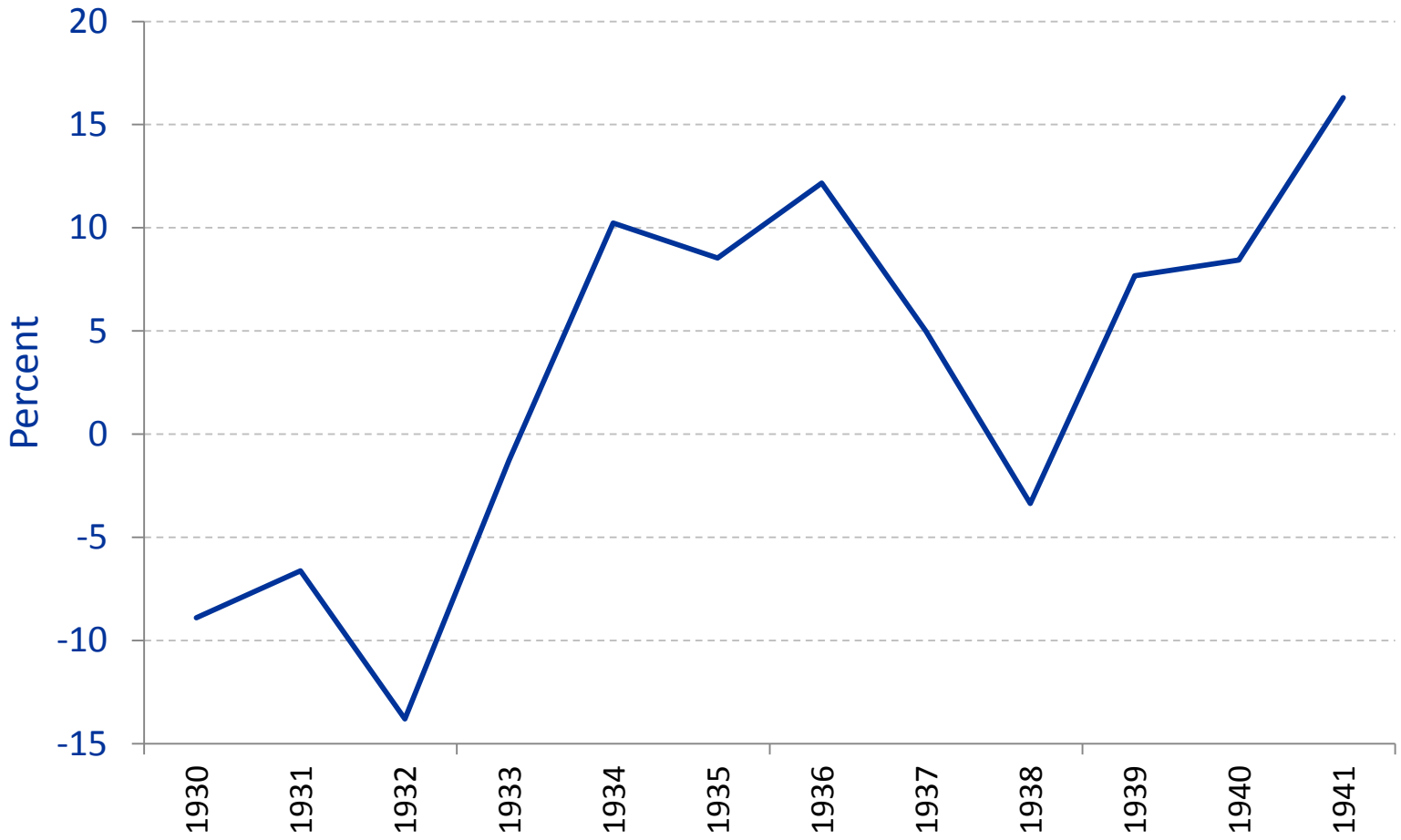


From: Romer, "The Nation in Depression," *JEP*, 1993

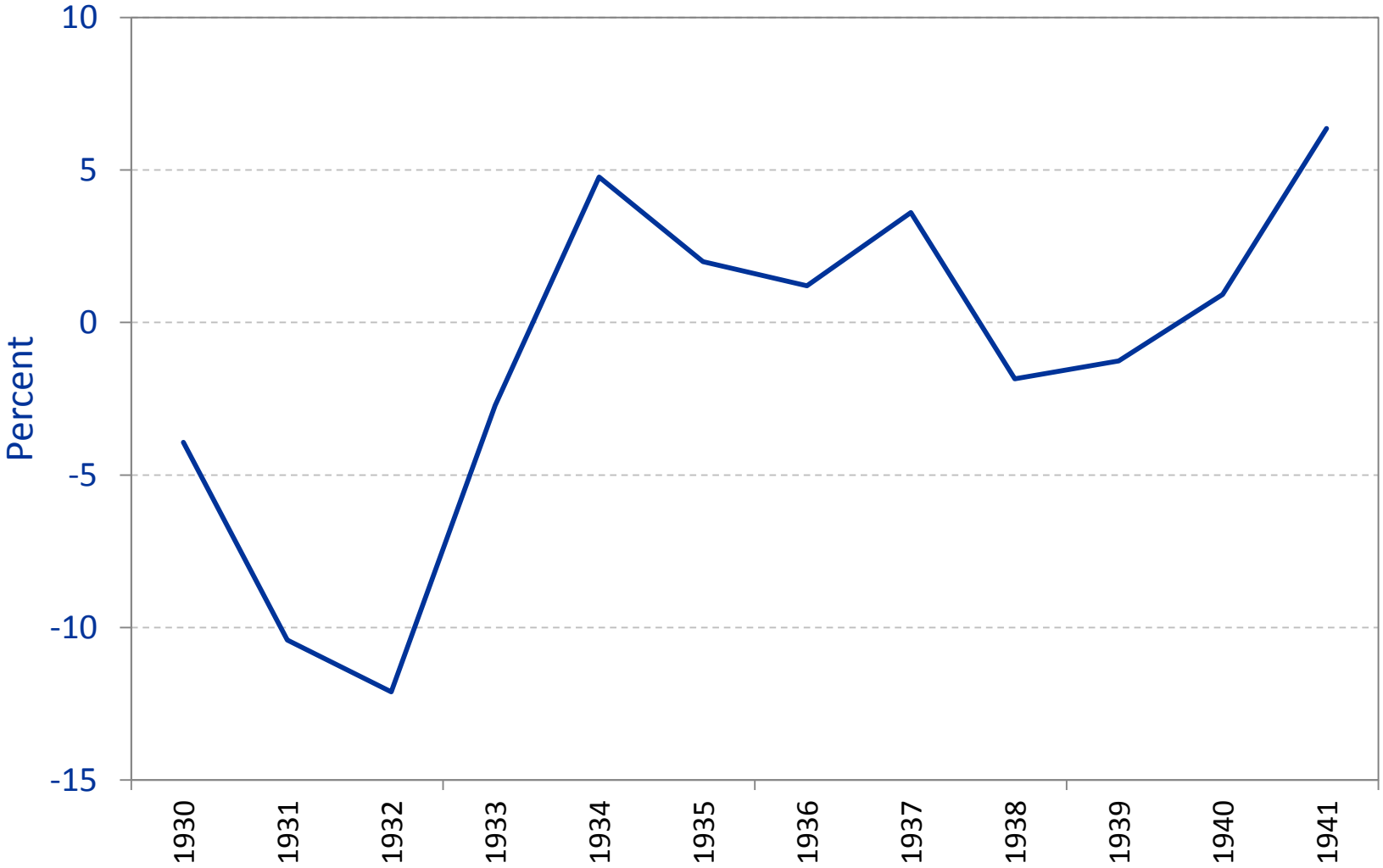
Unemployment Rate



Real GDP Growth



Inflation (using GDP Price Index)



Papers

- Eichengreen: The gold standard and the international scope of the depression.
- Romer: The stock market crash and the initial downturn.
- Richardson-Troost: Banking panics and the Federal Reserve.

II. Eichengreen

"Introduction," Chapter 1 of *Golden Fetters: The Gold Standard and the Great Depression 1919–1939*

Eichengreen's Thesis

- The gold standard played a central role in causing and propagating the Depression.
- Leaving the gold standard was a central cause of the recovery.

Eichengreen's Thesis in More Detail

- World War I and subsequent developments changed the gold standard from a stabilizing force to a potentially destabilizing one.
- In the late 1920s and early 1930s, the gold standard propagated shocks and prevented actions that would have promoted recovery.
- Leaving the gold standard provided scope for those actions.

Extreme Form of a Gold Standard: Gold as Currency

- No central bank or monetary policy.
- A fall in aggregate demand in one country causes its relative prices to fall.
- This increases its net exports, and so gold flows in.
- The money supply rises, cushioning the fall in AD.

The Classical Gold Standard

- Paper money circulates, but the central bank stands ready to buy or sell it for gold at a fixed price.
- The same basic cushioning mechanism as before can continue to operate.
- In addition, the central bank can conduct open-market operations. Thus, it can respond to a fall in AD by expanding the money supply and lowering interest rates, further cushioning the fall.

Potential Problems in the Adjustment Mechanism

- What if the commitment to the gold standard of a country facing a negative AD shock is in doubt?
- What if the central bank of a country with gold inflows does not allow the money supply to rise?

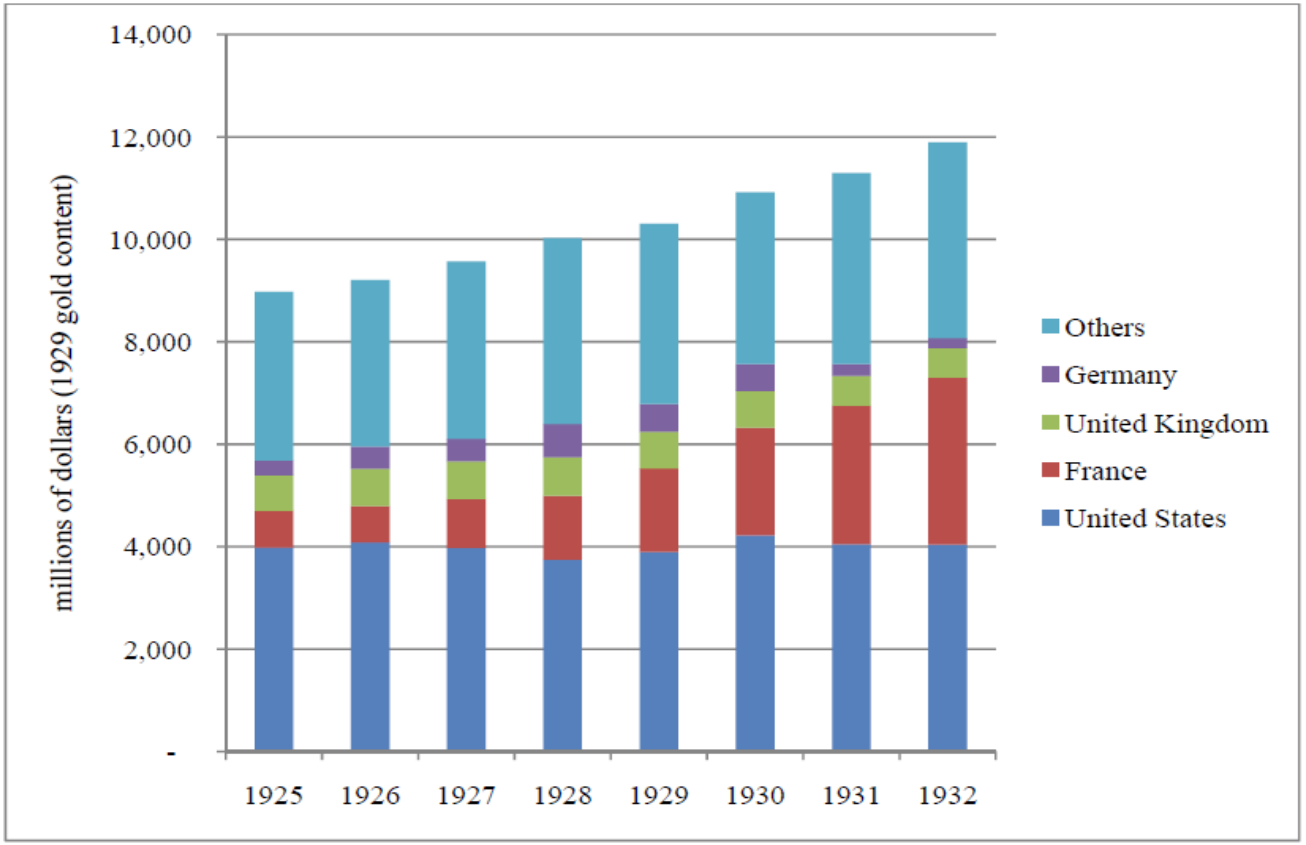
Eichengreen's Account of 1928–1930

- Modest monetary policy tightening in the U.S.; also, monetary policy tightening in France.
- "The minor shift in American policy had such dramatic effects because of the foreign reaction it provoked through its interaction with existing imbalances in the pattern of international settlements and with the gold standard constraints."
- Exacerbated by the downturn in the U.S. ("something of a deus ex machina").
- And by bank failures.
- The gold standard prevented unilateral expansion, and efforts at coordination failed.

What Types of Evidence Could One Examine?

- Cross-country macro performance – for example, countries that were never on the gold standard vs. others.
- Simple facts – for example, how close various countries were to legal limits; how unequally gold reserves were distributed across countries; what futures prices suggested about expectations of devaluation.
- Narrative – for example, about whether policymakers felt constrained by the gold standard.
- Case studies – for example, of unilateral expansion.
- Theoretical – for example, can one build a model where all this hangs together?
- …

Figure 1: World Gold Reserves, 1925-1932



Source: Hardy (1936, 92).

From: Irwin, NBER Working Paper No. 16350, 2010

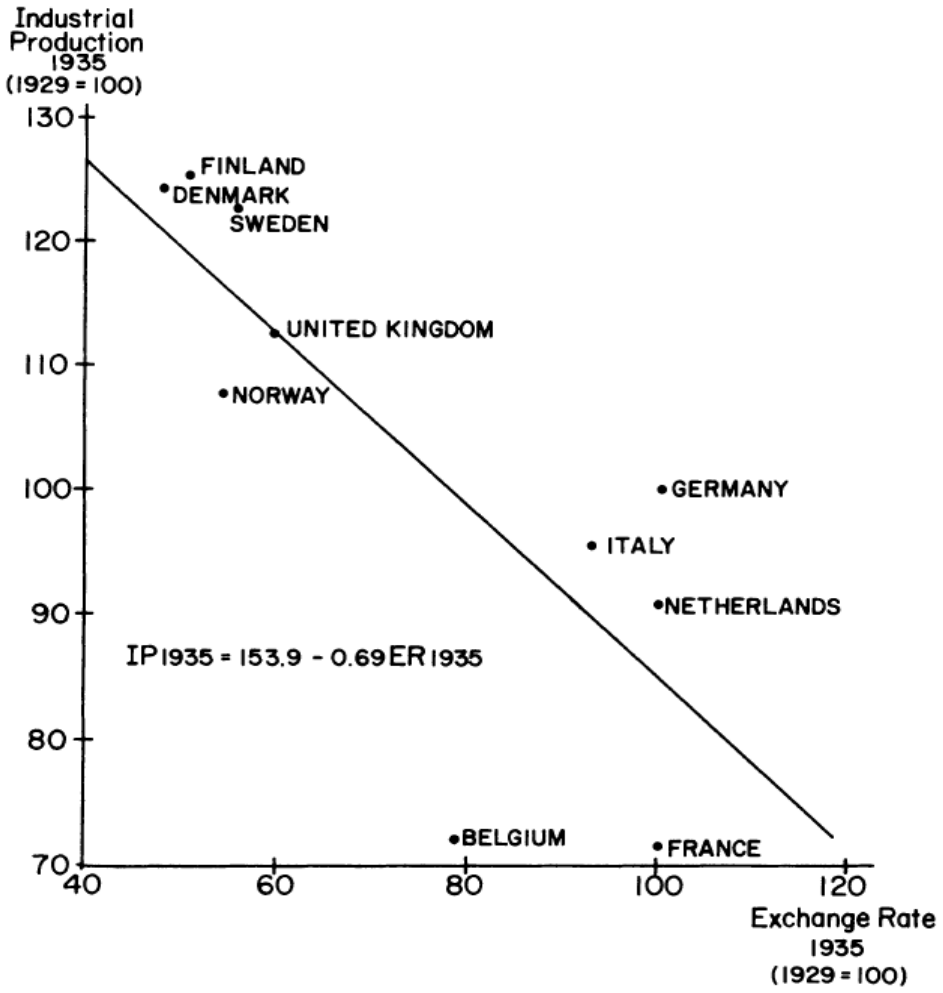


FIGURE 1
CHANGES IN EXCHANGE RATES AND INDUSTRIAL PRODUCTION, 1929–1935

From: Eichengreen and Sachs, *JEH*, 1985

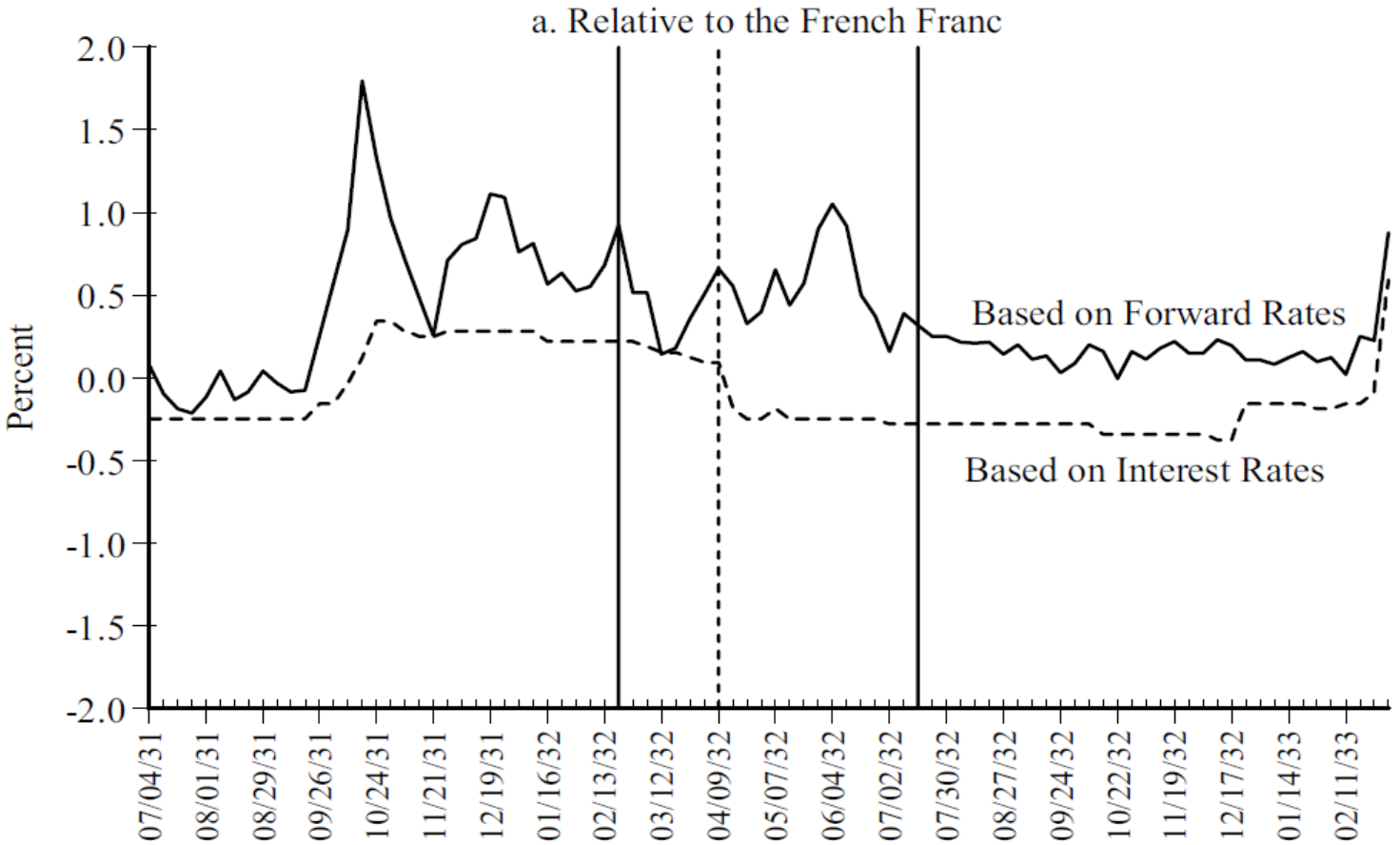


FIGURE 3
EXPECTED DEVALUATION OF THE DOLLAR RELATIVE TO THE FRENCH FRANC AND THE SWISS FRANC

From: Hsieh and Romer, *JEH*, 2006

Conclusion

III. Romer

"The Great Crash and the Onset of the Great Depression"

Overview

- There is general agreement that there was a fall in planned spending in the early stages of the Depression.

- Romer's thesis: The stock market crash led to a sharp rise in uncertainty that caused households to postpone spending on durables.

Theoretical Ideas

- Two key elements needed for uncertainty to have a large depressing effect on spending on durables:
  - The uncertainty is believed to be temporary.
  - Purchases of durables are somewhat irreversible.
- One prediction: uncertainty can lead to a rise in spending on nondurables.
- Note that the theory assumes that consumers do not see the general equilibrium implications.

The Link between Stock Price Volatility and Uncertainty

- General considerations?
- Considerations specific to the policy and institutional environment of the time?

TABLE I

CONSUMER BEHAVIOR FOLLOWING THE GREAT CRASH

	Cumulative percentage change in real seasonally adjusted retail sales					
	Oct. 1929	Nov. 1929	Dec. 1929	Jan. 1930	Feb. 1930	Mar. 1930
Automobile registrations	−5.5	−14.1	−18.9	−23.7	−11.7	−20.4
Department store sales	−8.4	−10.1	−4.5	−15.8	−11.7	−16.4
Mail-order sales	−4.1	−7.4	3.4	−20.6	−25.6	−35.8
Ten-cent store sales	−0.3	1.7	−2.5	−2.7	−0.1	−7.4
Grocery store sales	5.9	3.1	3.4	NA	NA	NA

	Percentage change in real output of consumer goods		
	1928	1929	1930
Durable goods	7.5	0.5	−32.4
Semidurable goods	4.1	1.8	−13.8
Perishable goods	1.6	4.3	−1.6

From: Romer, “The Great Crash”

Specification

$$\Delta y_{it} = a_i + b_i \Delta y_{i,t-1} + c_i \Delta y_{t-1} + d_i V_t + e_i \Delta W_t + u_t,$$

where:

- y_i is commodity output of type *i*;
- *y* is total commodity output;
- *V* is stock market volatility;
- *W* is real stock prices.

- Concerns?

TABLE II

Prewar Relationship Between Consumer Goods Output and Stock Market Variability

Category of commodity output	Coefficient estimates for equation (1)					
	a_i	b_i	c_i	d_i	e_i	R^2
Consumer durable goods	0.16	−0.09	−0.63	−66.06	−0.10	0.23
	(0.05)	(0.37)	(0.89)	(32.88)	(0.17)	
Consumer semidurable goods	0.06	0.16	−0.56	−3.49	0.11	0.43
	(0.02)	(0.19)	(0.21)	(12.54)	(0.06)	
Consumer perishable goods	0.06	−0.61	0.13	0.31	−0.01	0.32
	(0.02)	(0.18)	(0.16)	(9.68)	(0.05)	

Notes. Standard errors are in parentheses. All real variables are expressed as the first differences of logarithms. The average value of V_t is 0.001. The sample period used for estimation is 1891–1913 and 1921–1928.

From: Romer, "The Great Crash"

Narrative Evidence – Questions

- Was uncertainty unusually high following the stock market crash?
- Was the uncertainty caused by the crash?
- Was the uncertainty believed to have an important negative effect on spending?
- (Was the uncertainty expected to be temporary?)

Types of Information from the Forecasters

- Information about the forecasters. For example, did they become more uncertain?

- Information about consumers. For example, did forecasters believe that consumers had become more uncertain?

Example – Forecaster Uncertainty Soon after the Crash

- “the unprecedented declines in stock prices ... make it difficult to estimate at present the amount of injury which will be done to business.“
- “the extent of net paper losses and their effect can hardly be measured for the country as a whole.”
- The “full significance of the drastic drop in security values on future business can in no wise be measured.”
- “forecasters cannot yet read the riddle of 1930.”
- “the general outlook for trade and industry is thus one in which moderate restraint may be evidenced for some months, but ... recovery to a fair measure of prosperous conditions may be anticipated before the new year is far advanced.”

A Falsification-Style Test

- Perhaps uncertainty always appears to rise when the economy is doing badly.
- So, look at forecasters' views in other downturns in this period.

Conclusion

IV. Richardson and Troost:

"Monetary Intervention Mitigated Banking Panics during the Great Depression"

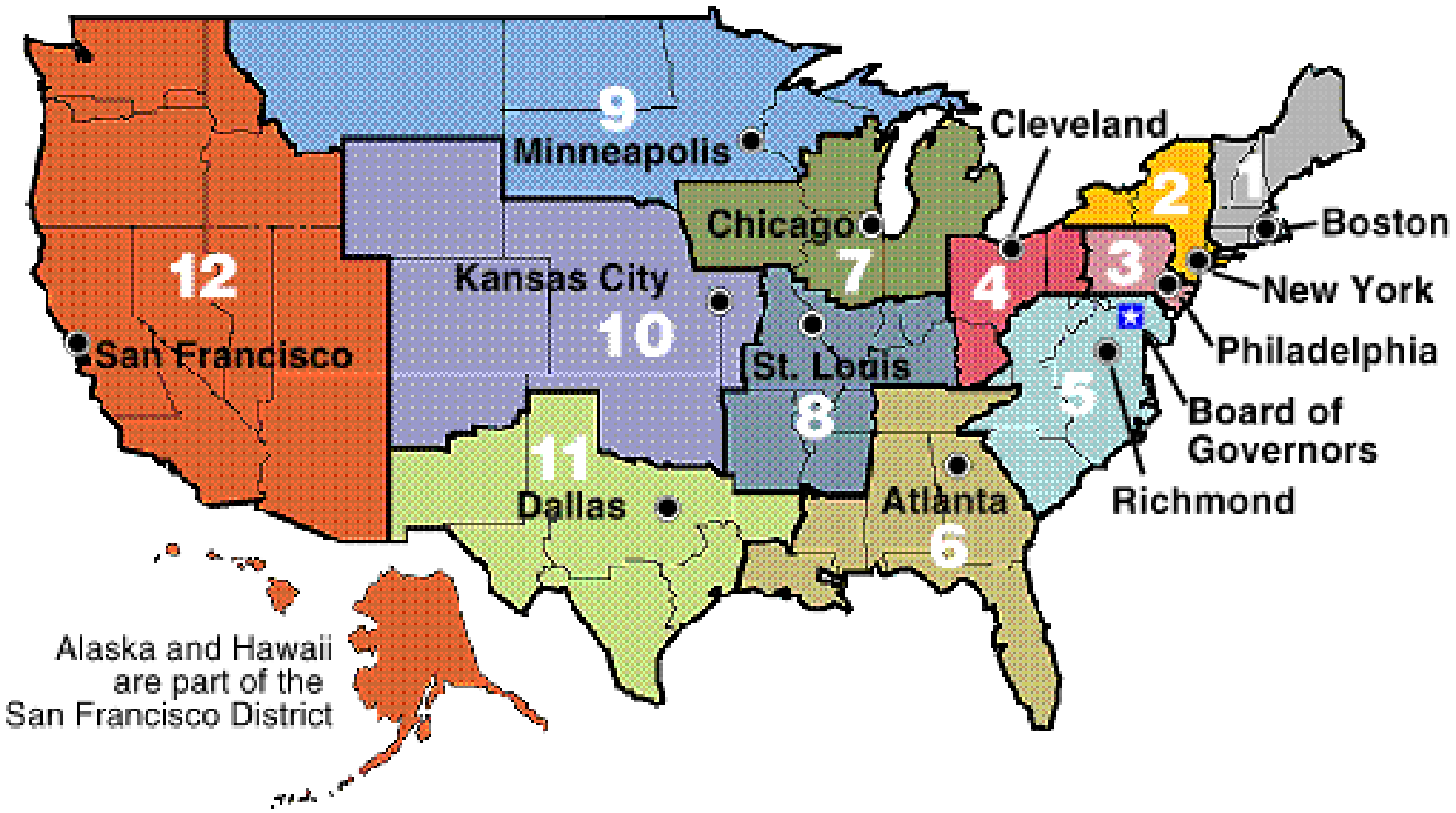
Where does Richardson and Troost fit into the literature?

- Eichengreen says panics mattered, but Fed was constrained by the gold standard from dealing with them.
- Friedman and Schwartz say panics mattered and Fed could have/should have stopped them.
- Calomiris and Mason say liquidity provision wouldn't have helped because banks were insolvent.
- Richardson and Troost test nos. 2 and 3.

Methodological Contribution

- Example of a paper using micro cross-section data to test a macro proposition.
- Will want to discuss the strengths and weaknesses of this approach.

Federal Reserve Districts



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 November 1930 there was a panic in Tennessee that was unrelated to MS banks, but nevertheless set off a panic in MS 6 weeks later.
- Can look for differences in bank failures in the two halves of MS.

What do they need to establish for this to be a good natural experiment?

- The two Fed districts (Atlanta and St. Louis) had different approaches to panics exogenously.
- Two halves of MS were otherwise the same.
- Panic had nothing directly to do with MS.

Evidence on Bank Policies

- Claim is that St. Louis (8th district) followed a real bills doctrine (lend in good times not bad) and Atlanta (6th district) followed Bagehot's Rule (aggressive discount lending during panics).
- How good is the narrative work?
- Judges ideas based in part on actions in the 1920s. Is this legitimate?
- Says that policy approaches became similar after 1931. Does this make you nervous?

Are the two halves of Mississippi otherwise similar?

- Why does this matter?
- What is the logic of looking at Mississippi in the first place?
- Is the evidence convincing that the two halves are similar?

Digression on Data Sources

- Rand McNally Bankers Directory
- U.S. Censuses of Agriculture and Manufacturing.
- Federal Reserve forms provide info on changes in bank status (suspensions versus liquidations).
- Census of American Business.
- Newspapers.

TABLE 1

NUMBER OF BANKS IN MISSISSIPPI ON JULY 1 OF EACH YEAR

	STATE CHARTER			NATIONAL CHARTER		
		Federal Reserve District			Federal Reserve District	
YEAR	All	6th Atlanta	8th St. Louis	All	6th Atlanta	8th St. Louis
1929	274	120	155	35	21	14
1930	259	105	154	35	22	13
1931	222	96	126	28	18	10
1932	206	89	108	27	18	9
1933	189	82	106	24	15	9

SOURCE.—*Rand McNally Bankers' Directory*, various July issues, 1929–35.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

TABLE 2
CHARACTERISTICS OF BANKS IN MISSISSIPPI ON JULY 1, 1929

	6TH FEDERAL RESERVE DISTRICT (Atlanta)						8TH FEDERAL RESERVE DISTRICT (St. Louis)					
	All 6th (N = 141)			Near Border (N = 76)			Near Border (N = 169)			All 8th N = 112)		
	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation
Financial ratios:												
Net worth/total assets	.10	.11	.04	.10	.11	.04	.13	.14	.06	.11	.13	.05
Cash/total assets	.37	.38	.14	.36	.39	.14	.38	.37	.15	.38	.38	.15
Deposits/total liabilities	.87	.85	.07	.88	.85	.08	.85	.82	.11	.86	.83	.10
Financial characteristics:												
Total assets ($1,000)	559	1,166	141	514	1,211	225	451	790	106	448	748	76
Loans and discounts ($1,000)	334	676	1,070	278	713	1,288	270	464	755	256	437	668
Cash and exchanges ($1,000)	92	204	310	84	228	373	92	174	276	91	157	237
Deposits ($1,000)	506	1,003	1,445	465	1,040	1,699	379	662	993	369	629	869
Paid-up capital ($1,000)	30	59	75	30	63	86	30	52	65	30	49	57
State-chartered banks (%)		.85	.36		.88	.33		.90	.30		.92	.28
Federal Reserve member (%)		.15	.36		.12	.33		.12	.32		.10	.30
Years in operation	24	23.2	12.3	24.5	24.0	12.7	21	21.9	14.9	20.5	21.8	14.2
Correspondents (N)	3	3.10	.90	3	3.08	.95	3	3.04	.89	3	2.96	.96

SOURCE.—*Rand McNally Bankers' Directory*, various July issues, 1929–35.
NOTE.—Near border sample consists of banks in counties for which at least 50 percent of the area lies within 1 degree latitude of the Federal Reserve district border.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

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).

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

Was the panic an exogenous shock?

- Is this important?
- What evidence do Richardson and Troost provide?
- Have they already answered the question of whether the panic was a liquidity problem rather than an insolvency problem?

Basic Findings

- Panic in Mississippi in December 1930.
- The two Federal Reserve banks responded very differently.
- Very different levels of suspensions and failures in the two halves of Mississippi.

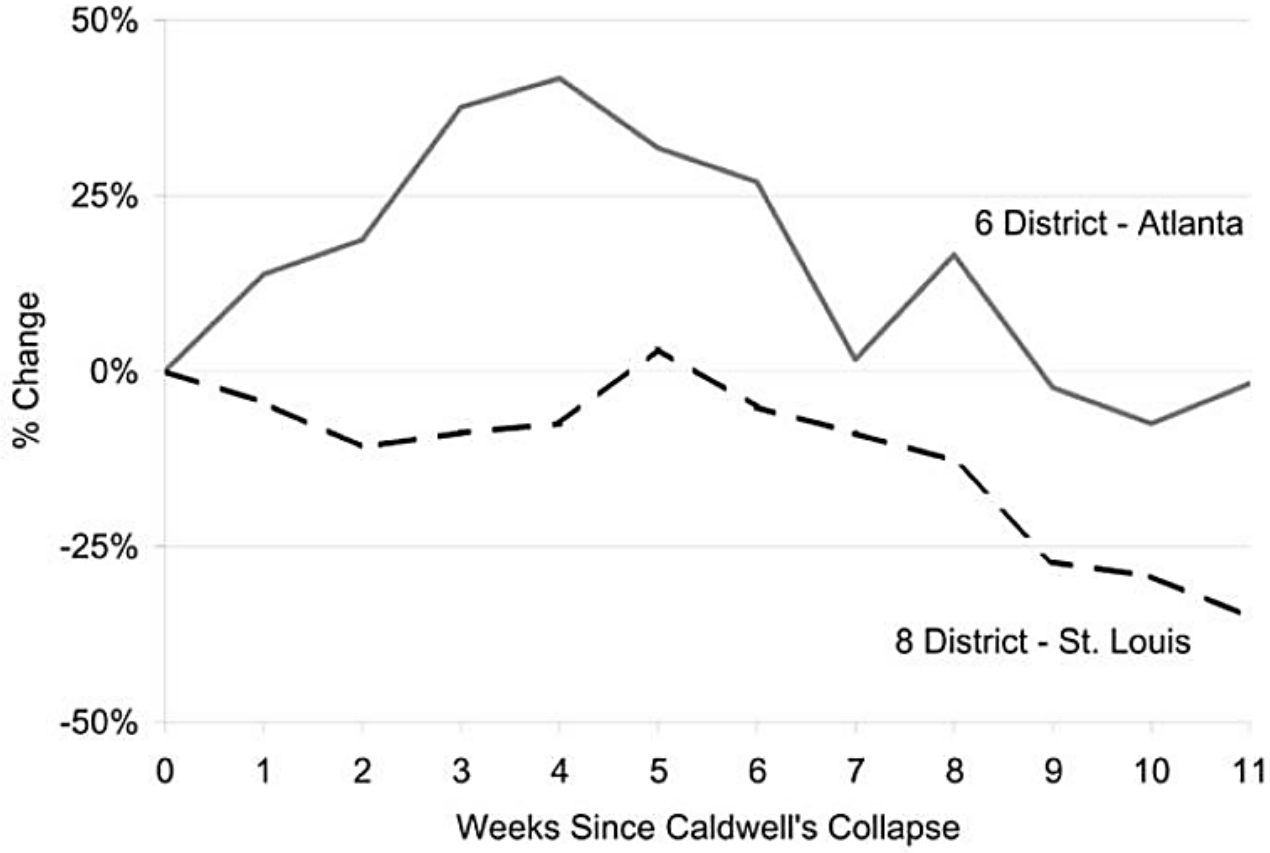


FIG. 2.—Discount response after the collapse of Caldwell, aggregate discounts each week as a percentage of initial level. Source: See Section II.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

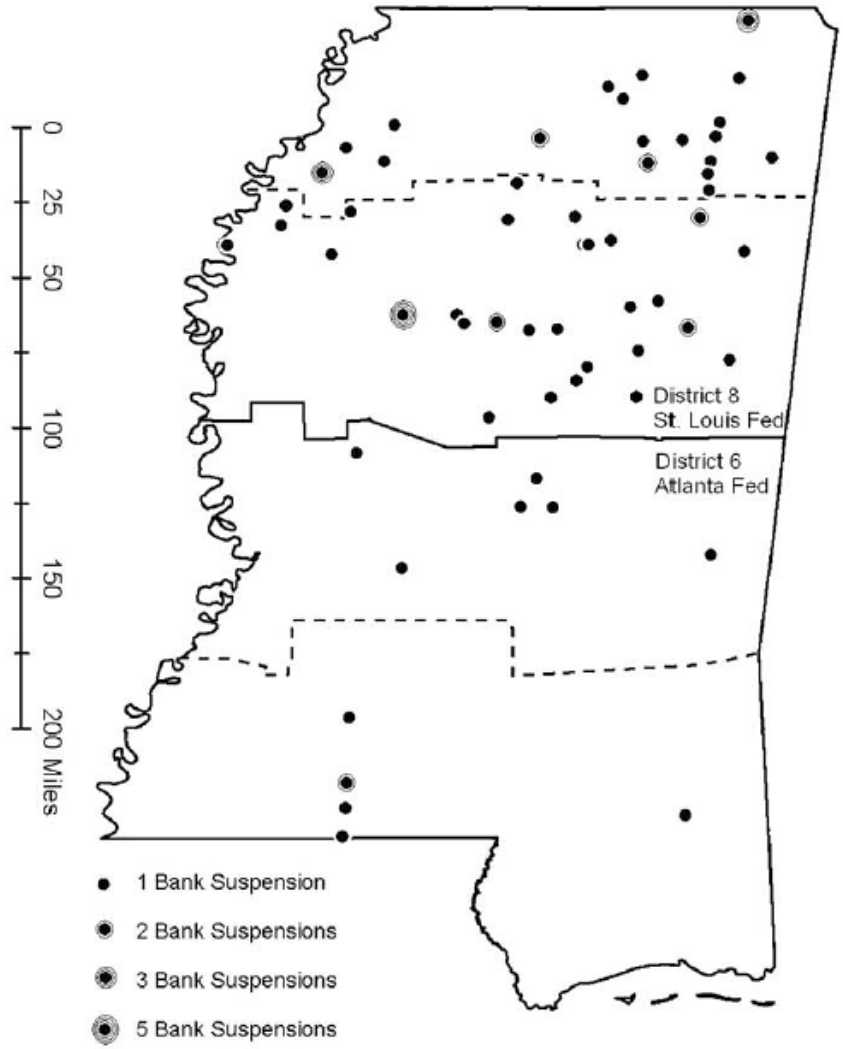


FIG. 1.—Mississippi's division into Federal Reserve districts and bank suspensions between October 1930 and March 1931. Source: See Section II. The solid line represents the Federal Reserve district border. The dotted lines enclose the counties for which at least half the area lies within 1 degree latitude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

TABLE 4

BANK SUSPENSIONS AND LIQUIDATIONS

Begin July 1		End June 30	Percentage of Banks Suspending			Percentage of Banks Liquidating		
				Federal Reserve District			Federal Reserve District	
			All (1)	6th Atlanta (2)	8th St. Louis (3)	All (4)	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, 2007*a*, 2007*b*, 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.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

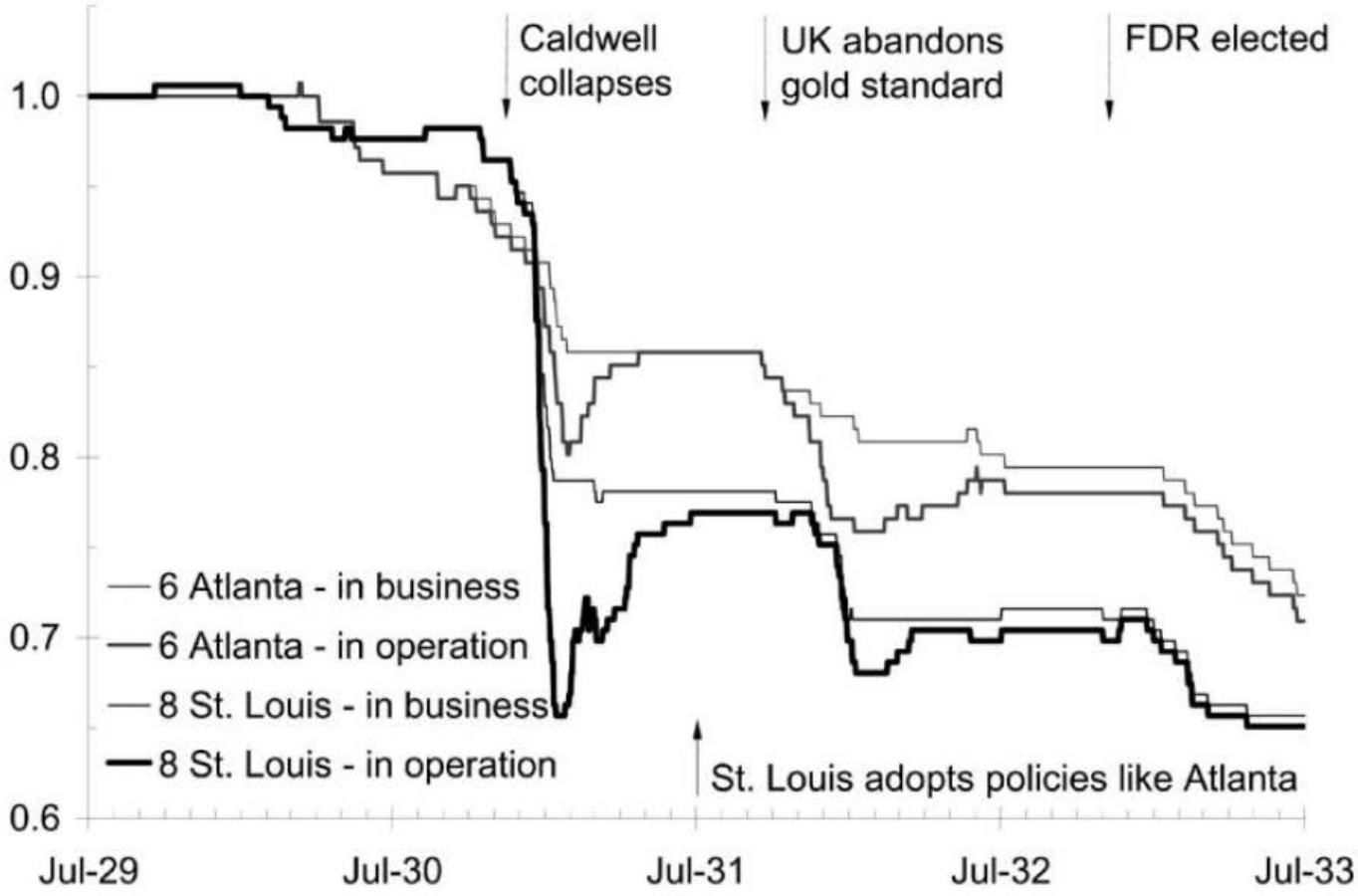


FIG. 3.—Percentage of banks in business and in operations in the 6th and 8th Federal Reserve Districts in Mississippi, July 1929 to June 1933. Source: See Section II.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

Nonparametric Estimates

[5] Our estimates of the survival function, $S(t)$, the raw hazard function, $h(t)$, and the smoothed hazard function, $g(t)$, are

$$\hat{S}(t) = \prod_{t_i<t} \frac{n_i - d_i}{n_i},$$

where n_i is the number of banks in business at the beginning of time period t_i, d_i is the number of banks experiencing an event (such as entering receivership) at time t_i, and t_i indicates the ith time period. The raw hazard for period t_i is

$$\hat{h}(t_i) = \frac{d_i}{n_i}.$$

The hazard function is estimated by smoothing raw hazards, so that the hazard in the ith time period is

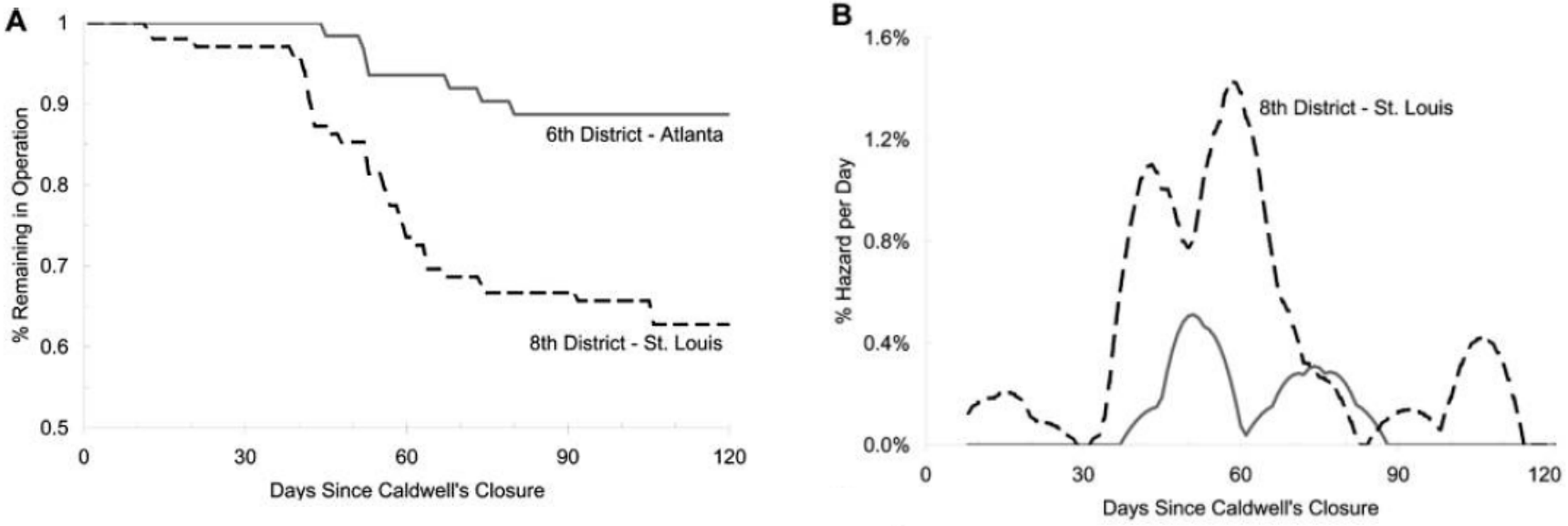
$$\hat{g}(t_i) = \sum_{z=-u}^{u} K_z \hat{h}(t_{i+z}),$$

where u is the bandwidth and

$$K_z = \frac{(u+1)^2 - z^2}{\sum_{z=-u}^{u} [(u+1)^2 - z^2]}.$$

FIG. 4.—Survival and hazard during the post-Caldwell panic, principle nonparametric controls.

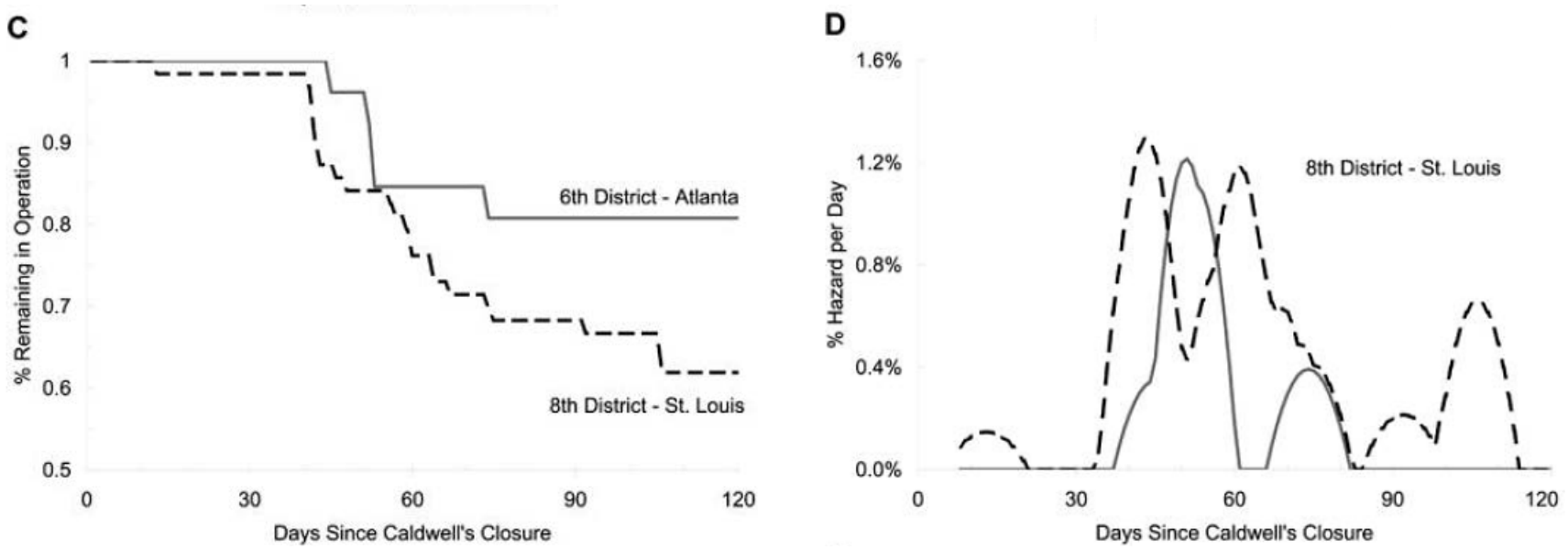
All Banks



From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

FIG. 4.—Survival and hazard during the post-Caldwell panic, principle nonparametric controls.

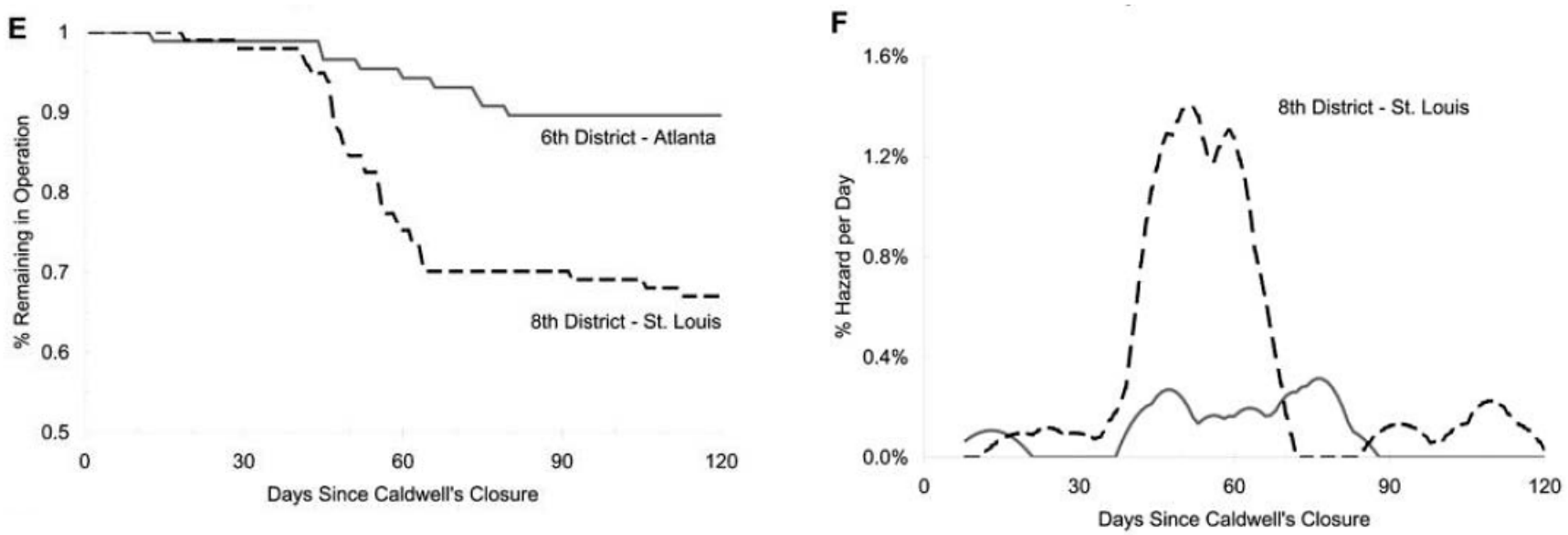
Within 1° Latitude of District Border



From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

FIG. 4.—Survival and hazard during the post-Caldwell panic, principle nonparametric controls.

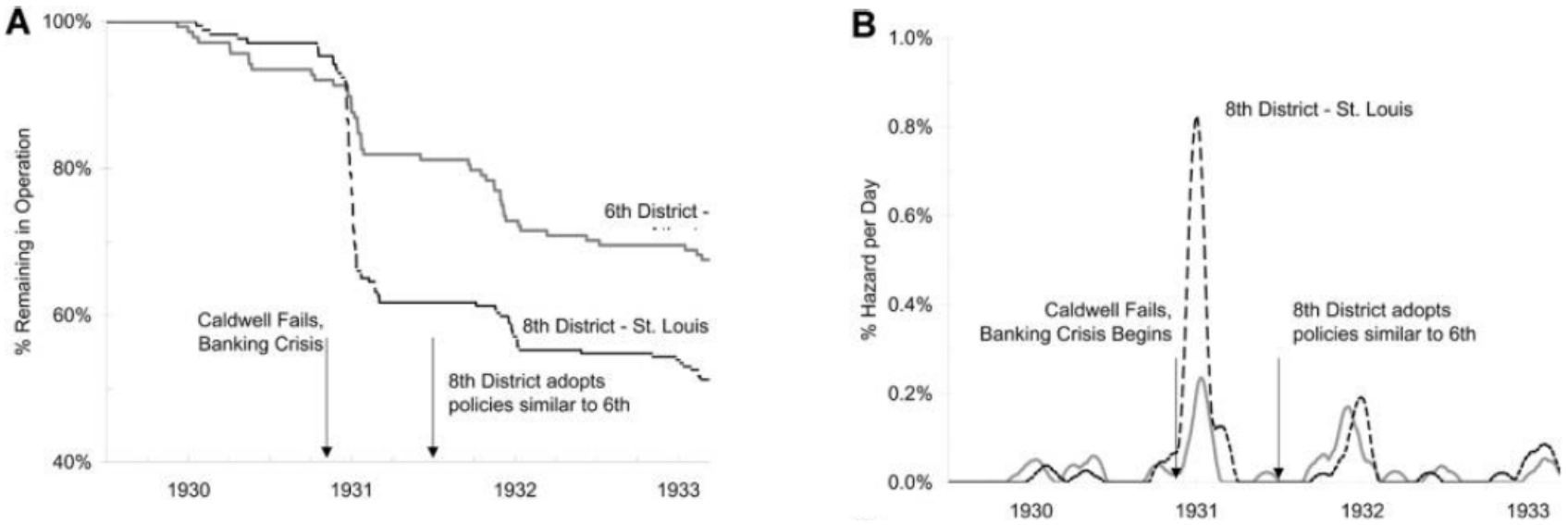
Banks Founded before the Fed



From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

FIG. 5.—Bank suspension in the 6th and 8th Federal Reserve Districts, July 1929 through February 1933.

All Banks



From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

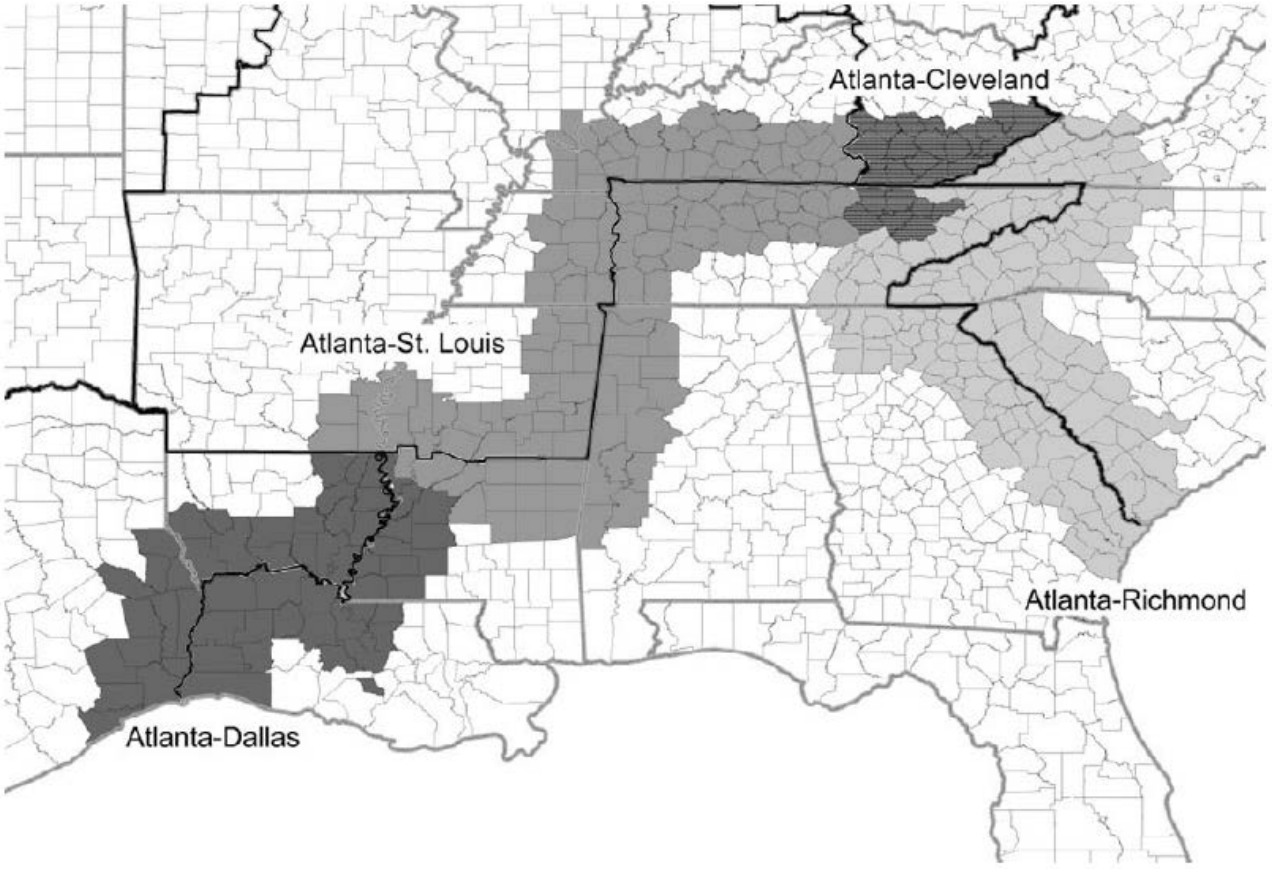
Other Analysis

- Parametric estimates.
- Discussion of robustness is very impressive and thorough.

Evaluation

- Did you like it?
- What could have been done better?

FIGURE 1
COUNTIES WITHIN FIFTY MILES OF ATLANTA FED DISTRICT BORDER



From: Andrew Jalil, " Monetary Intervention Really Did Mitigate Banking Panics during the Great Depression"

FIGURE 3
BANK SUSPENSION RATES, 1930

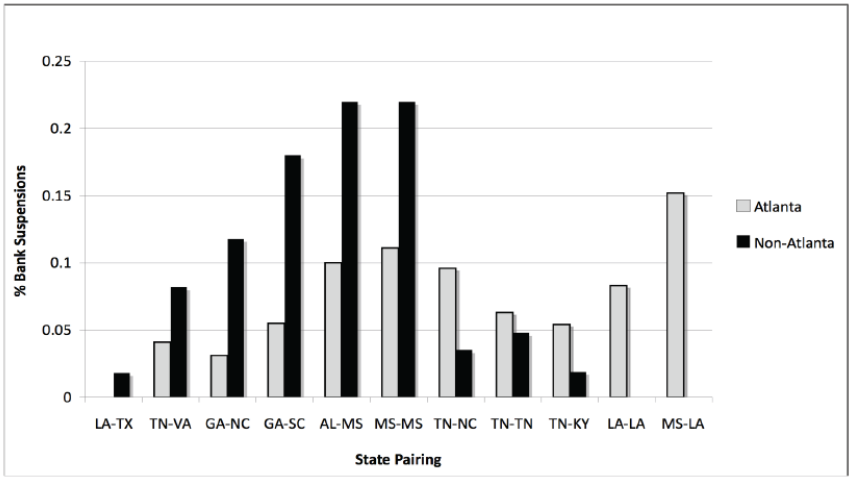
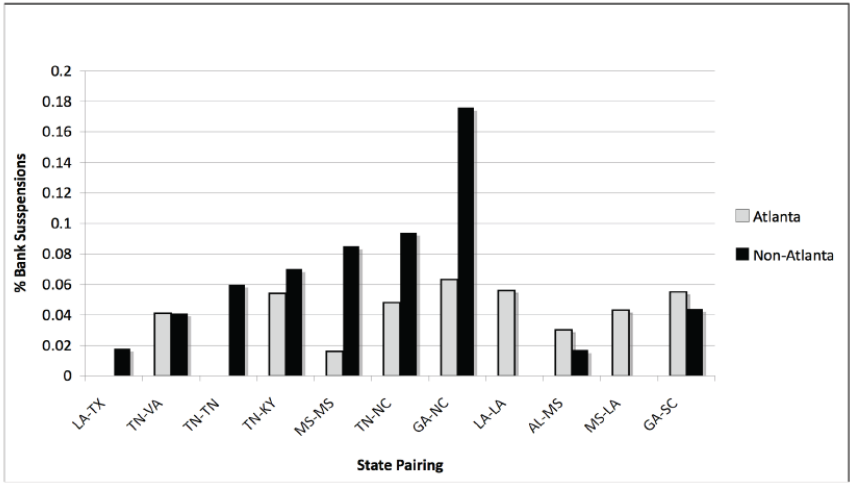


FIGURE 4
BANK SUSPENSION RATES, 1931



From: Andrew Jalil, " Monetary Intervention Really Did Mitigate Banking Panics during the Great Depression"

Did the difference in Fed policy matter for real outcomes in the two halves of Mississippi?

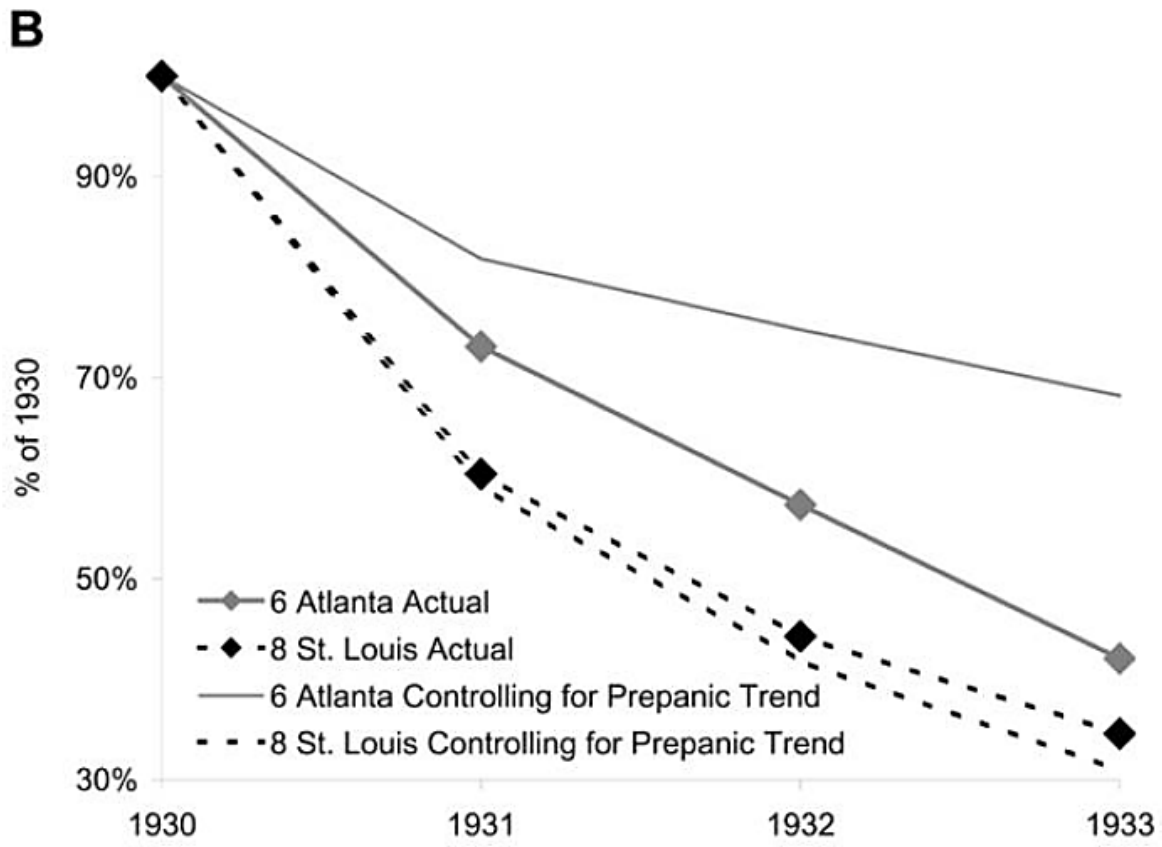


FIG. 6.—Comparing consequences of the banking panics in the 6th and 8th Districts. *A*, Total deposits as a percentage of total deposits in June 1930. *B*, Total loans and discounts as a percentage of the total in June 1930.

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

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
Δ%	−18.1	−34.7
Net sales:		
$1,000s in 1929	140,776	245,486
$1,000s in 1933	59,513	83,727
Δ%	−57.7	−65.9

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

From: Richardson and Troost, "Monetary Intervention Mitigated Banking Panics"

TABLE 2—EFFECTS ON OUTPUT VARIABLES

	Revenue				Physical output		
	Within (1)	Balanced (2)	Unbalanced (3)	County (4)	Within (5)	Balanced (6)	Unbalanced (7)
St. Louis Fed 1931	−0.24***	−0.21***	−0.18**	−0.28*	−0.37***	−0.53**	−0.43**
	(0.06)	(0.08)	(0.09)	(0.16)	(0.11)	(0.19)	(0.17)
St. Louis Fed	—	−0.12	−0.15*	—	—	−0.18	0.20
		(0.11)	(0.08)			(0.20)	(0.28)
Observations	1,226	635	1,224	148	479	282	479
Adjusted R^2	0.57	0.61	0.56	0.94	0.64	0.81	0.79

Notes: All dependent variables are in logs. The within specification includes plant fixed effects. All the regressions include industry-specific time trends though the coefficients are excluded for clarity. The price and quantity effects are only for plants producing one good. Plant-clustered standard errors are reported in parentheses. County-level regressions include full set of county fixed effects with standard errors clustered at the county level and observations weighted by number of plants in a given county. Note there is no St. Louis Fed coefficient for the county estimates because I estimate a full set of county fixed effects.

***Significant at the 1 percent level.

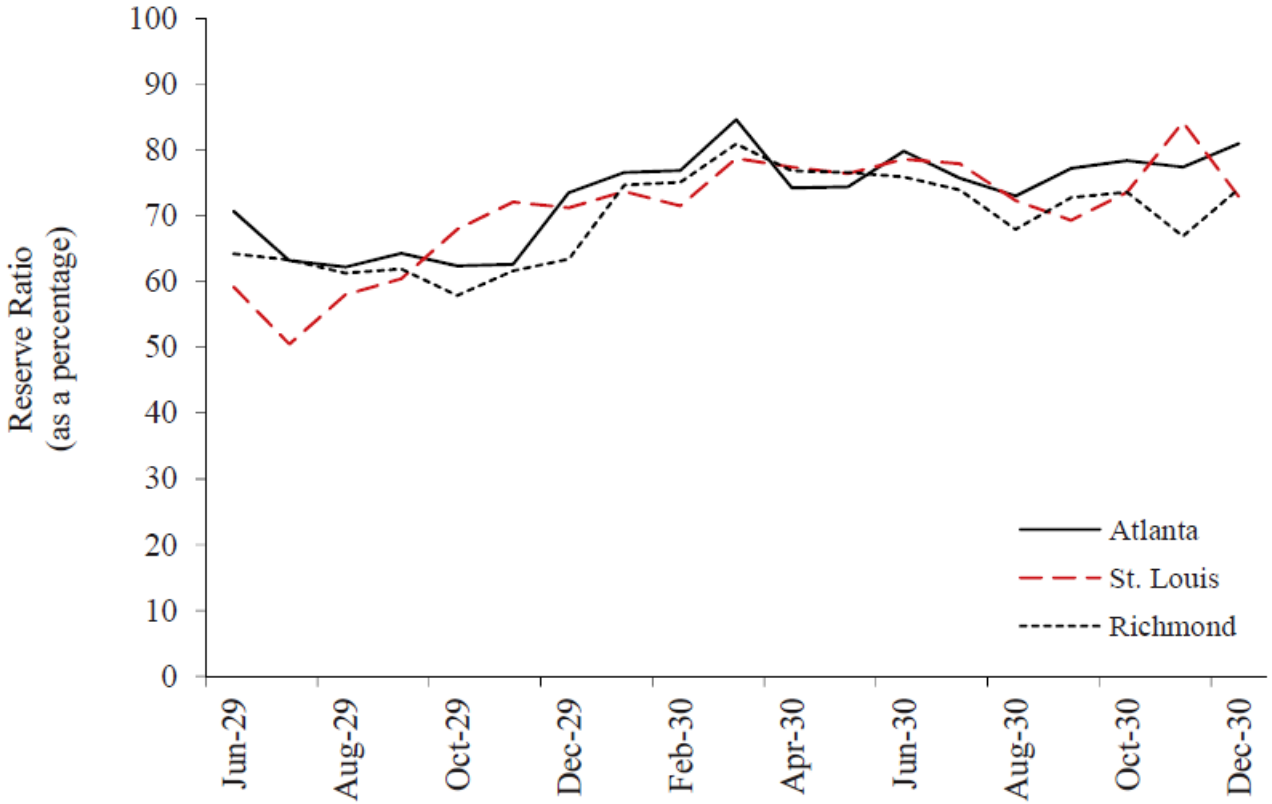
**Significant at the 5 percent level.

*Significant at the 10 percent level.

From: Nicholas Ziebarth, "Identifying the Effects of Bank Failures from a Natural Experiment in Mississippi during the Great Depression"

How does Richardson and Troost's analysis relate to Eichengreen?

FIGURE 2
RESERVE POSITION OF ATLANTA, ST. LOUIS, AND RICHMOND FEDERAL RESERVE BANKS



From: Andrew Jalil, " Monetary Intervention Really Did Mitigate Banking Panics during the Great Depression"