

LECTURE 1

Overview of U.S. Macroeconomic History and Data



August 22, 2018

I. BEN S. BERNANKE, “A CENTURY OF U.S. CENTRAL BANKING: GOALS, FRAMEWORK, ACCOUNTABILITY”

Themes in Bernanke's Speech?

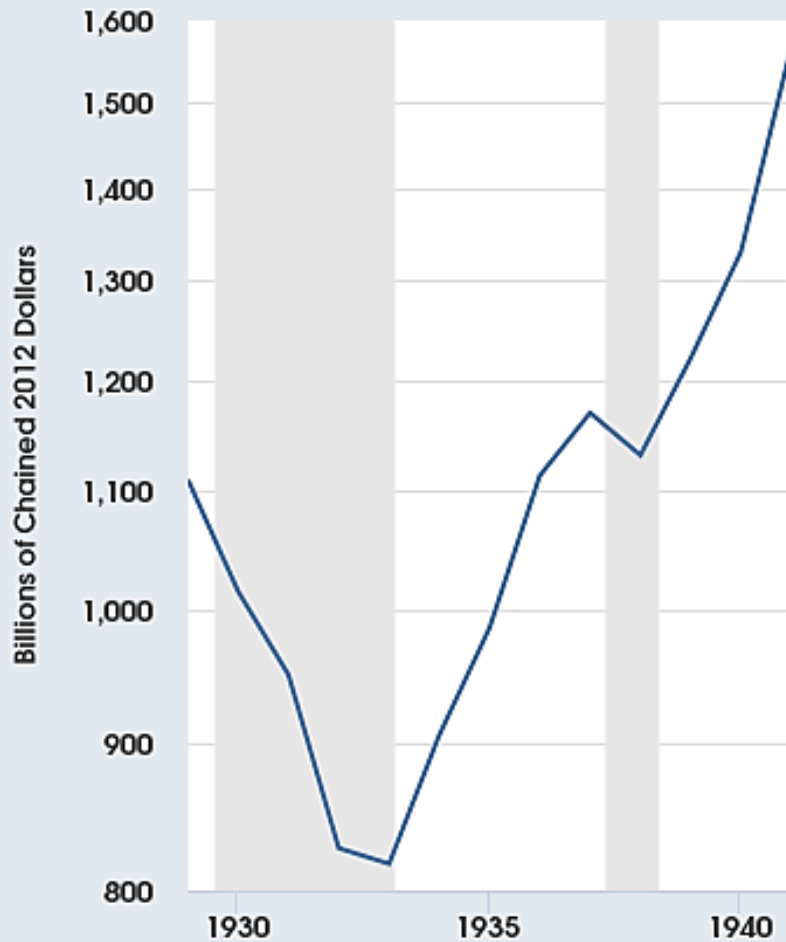
- Different epochs in the history of the Federal Reserve and the U.S. macroeconomy over the past century.
- Changes in the monetary regime.
- Changes in policymakers' framework and ideas.
- The importance of panics and financial crises.

Epochs in U.S. Macroeconomic/Monetary History over the Past Century

- The early Fed (1913–1929).
- The Great Depression and subsequent recovery (1929–1941).
- World War II (1941–1945 [or 1951?]).
- The early postwar period (1945 [or 1951?]-1964[?]).
- The Great Inflation (1964[?]-1979).
- The Volcker disinflation and the Great Moderation (1979–2007).
- The Great Recession and its aftermath (2007–present).

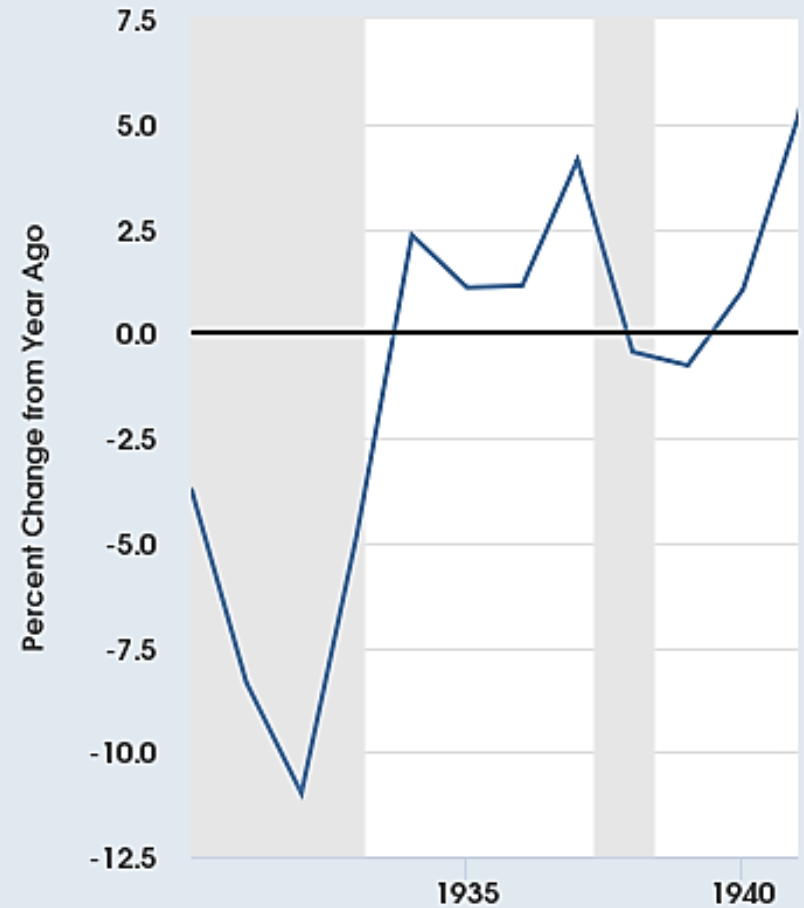
The Great Depression and Recovery

FRED — Real Gross Domestic Product



Source: U.S. Bureau of Economic Analysis

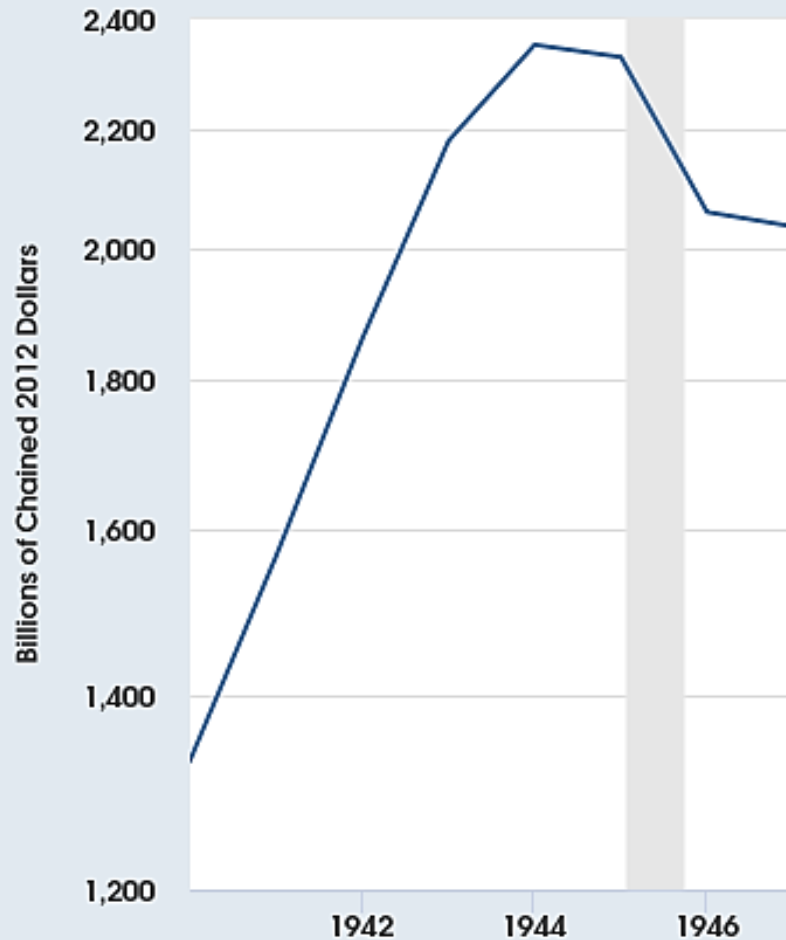
FRED — Personal consumption expenditures excluding food and energy (chain-type price index)



Source: U.S. Bureau of Economic Analysis

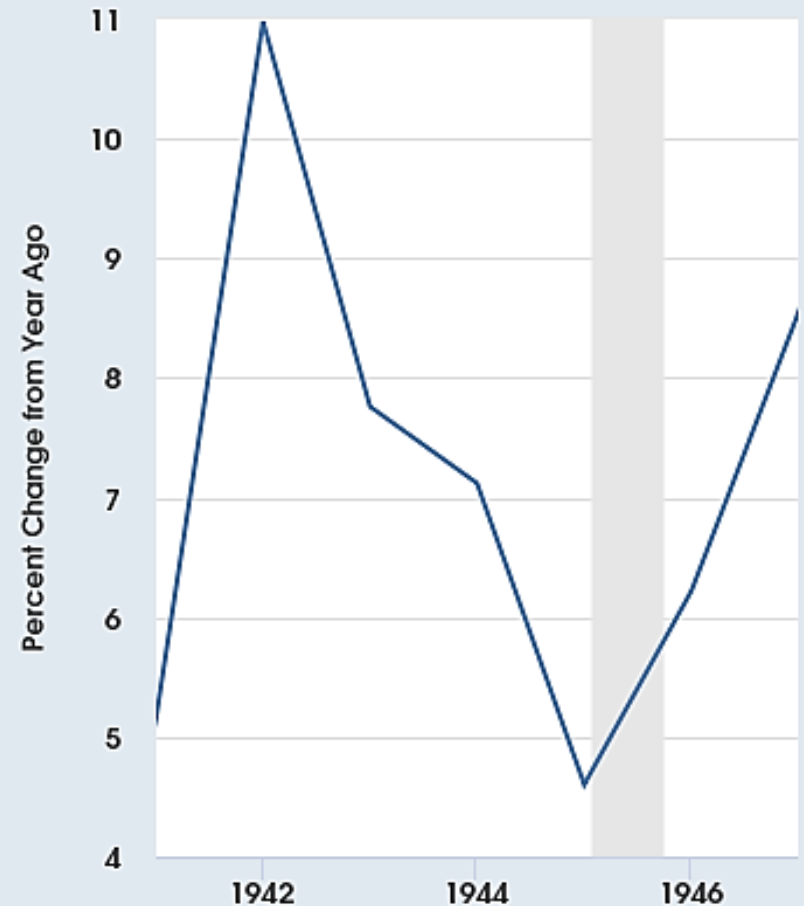
World War II and the Demobilization

FRED — Real Gross Domestic Product



Source: U.S. Bureau of Economic Analysis

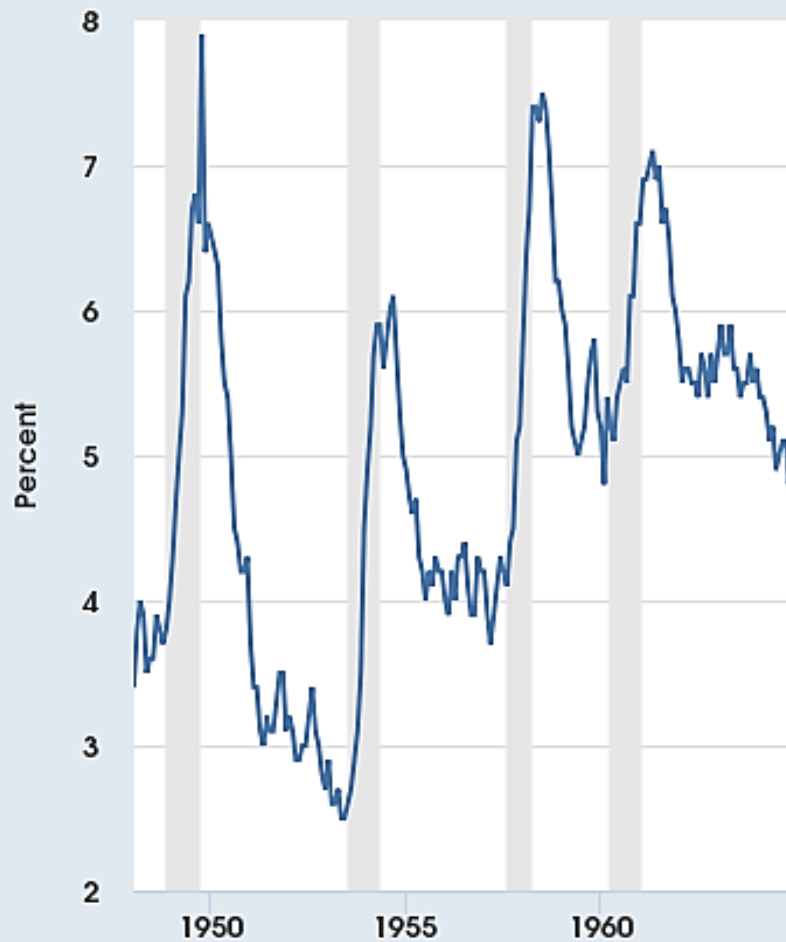
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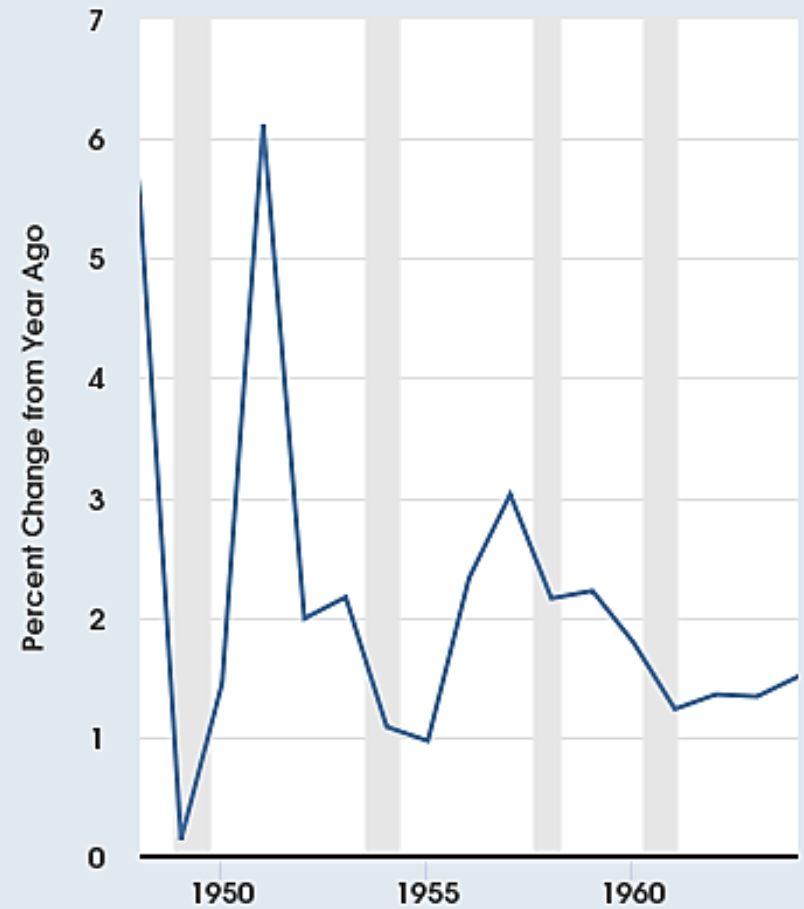
The Early Postwar Period

FRED — Civilian Unemployment Rate



Source: U.S. Bureau of Labor Statistics

FRED — Personal consumption expenditures excluding food and energy (chain-type price index)



Source: U.S. Bureau of Economic Analysis

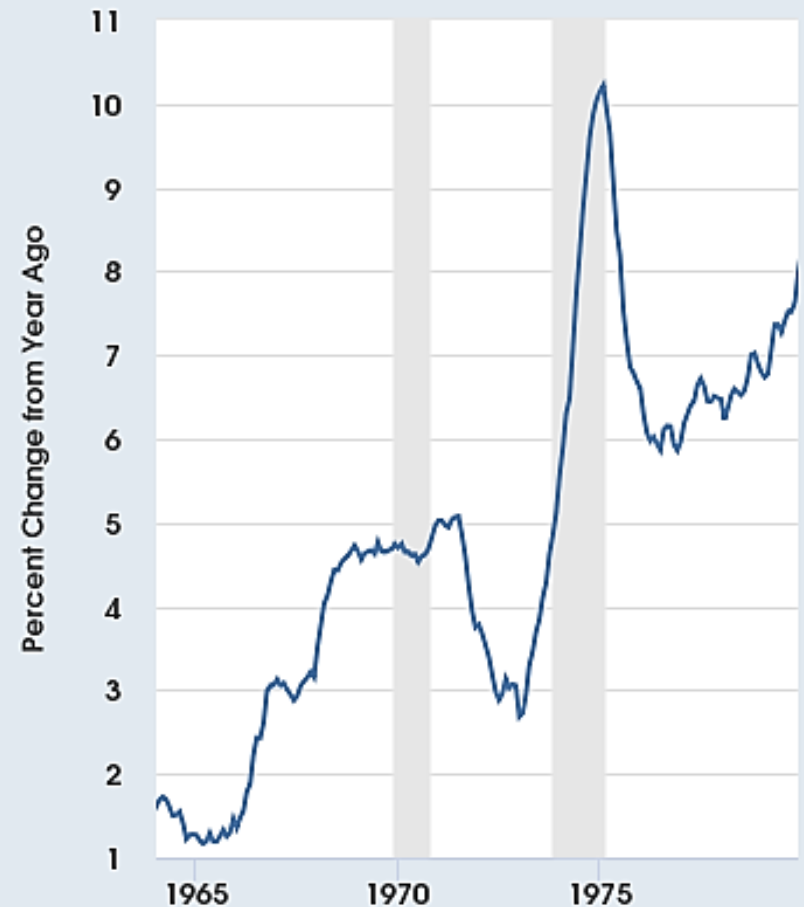
The Great Inflation

FRED — Civilian Unemployment Rate



Source: U.S. Bureau of Labor Statistics

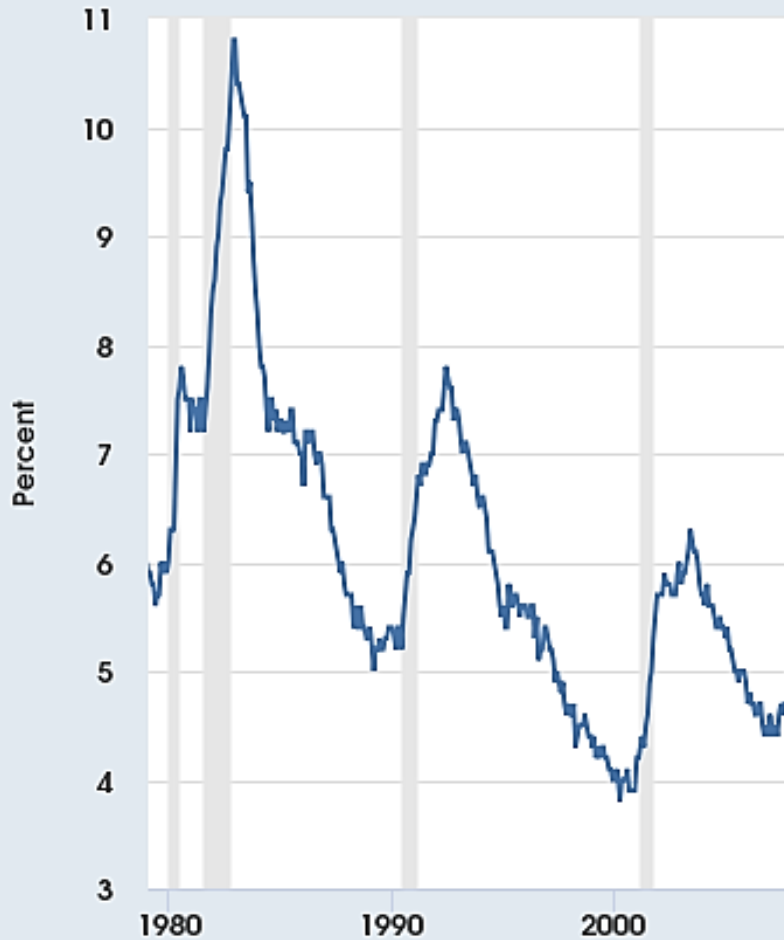
FRED — Personal Consumption Expenditures Excluding Food and Energy (Chain-Type Price Index)



Source: U.S. Bureau of Economic Analysis

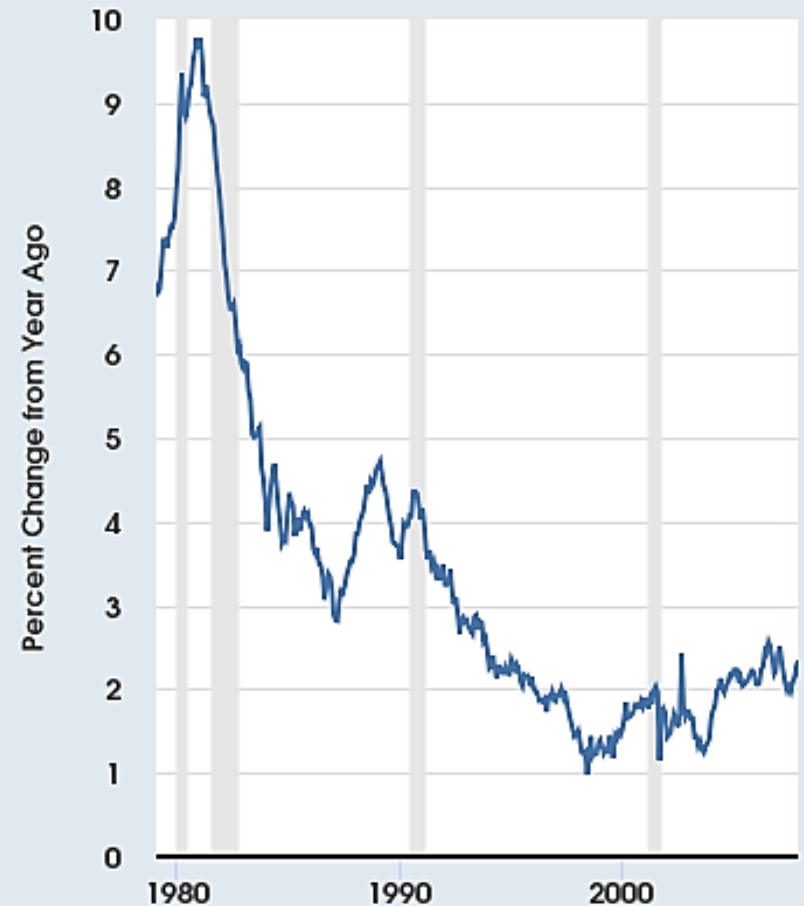
The Volcker Disinflation & The Great Moderation

FRED — Civilian Unemployment Rate



Source: U.S. Bureau of Labor Statistics

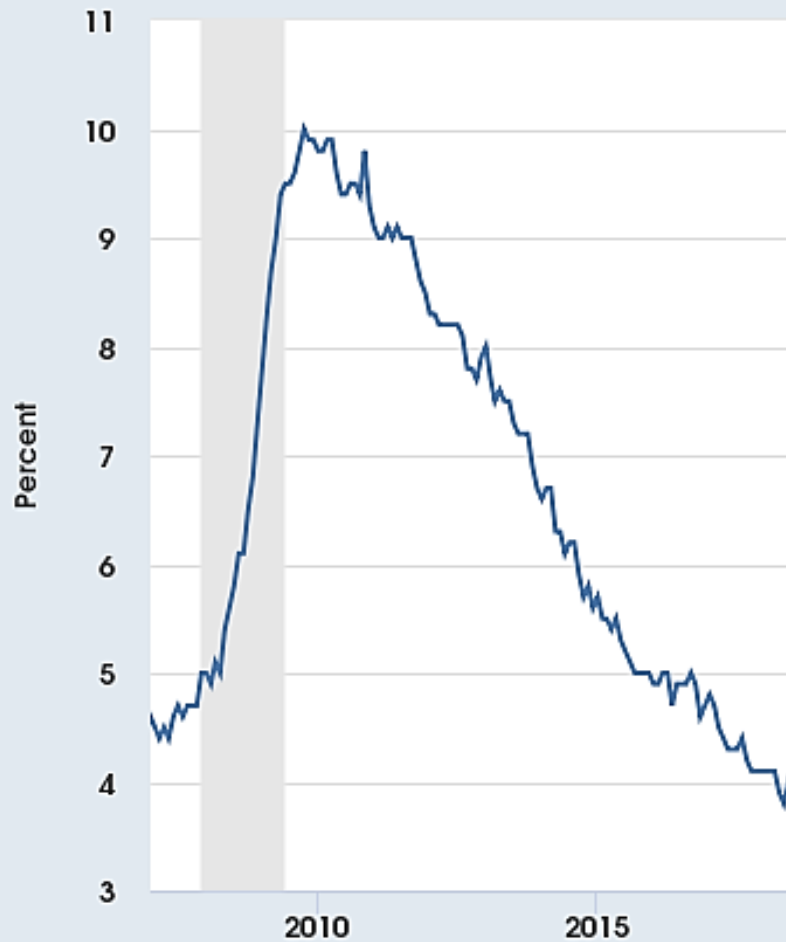
FRED — Personal Consumption Expenditures Excluding Food and Energy (Chain-Type Price Index)



Source: U.S. Bureau of Economic Analysis

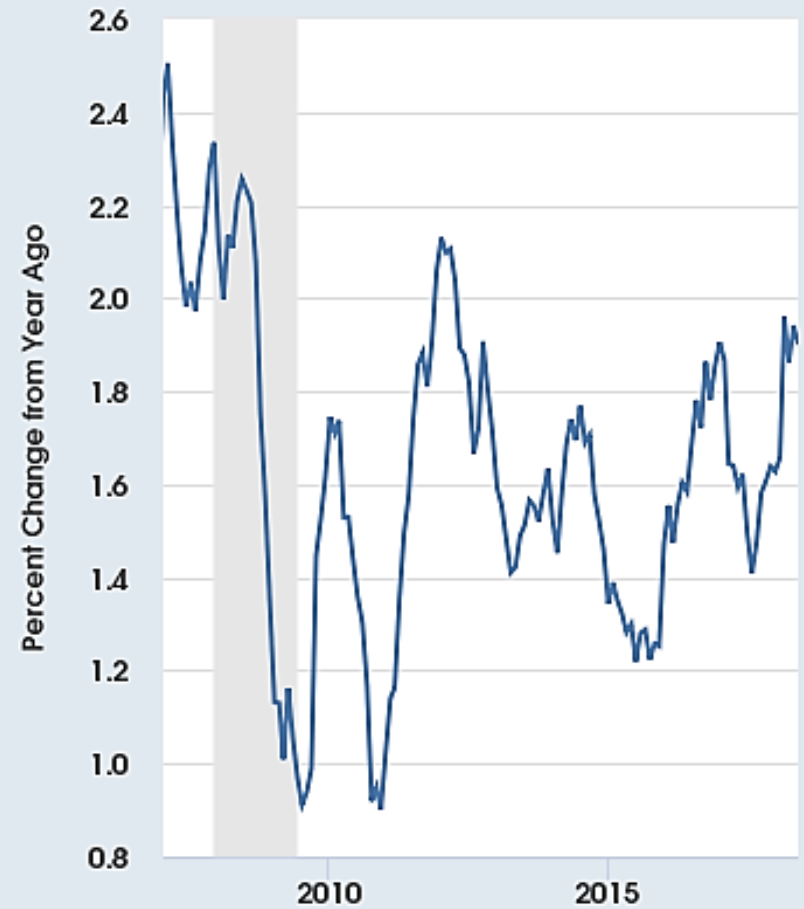
The Great Recession and Its Aftermath

FRED — Civilian Unemployment Rate



Source: U.S. Bureau of Labor Statistics

FRED — Personal Consumption Expenditures Excluding Food and Energy (Chain-Type Price Index)

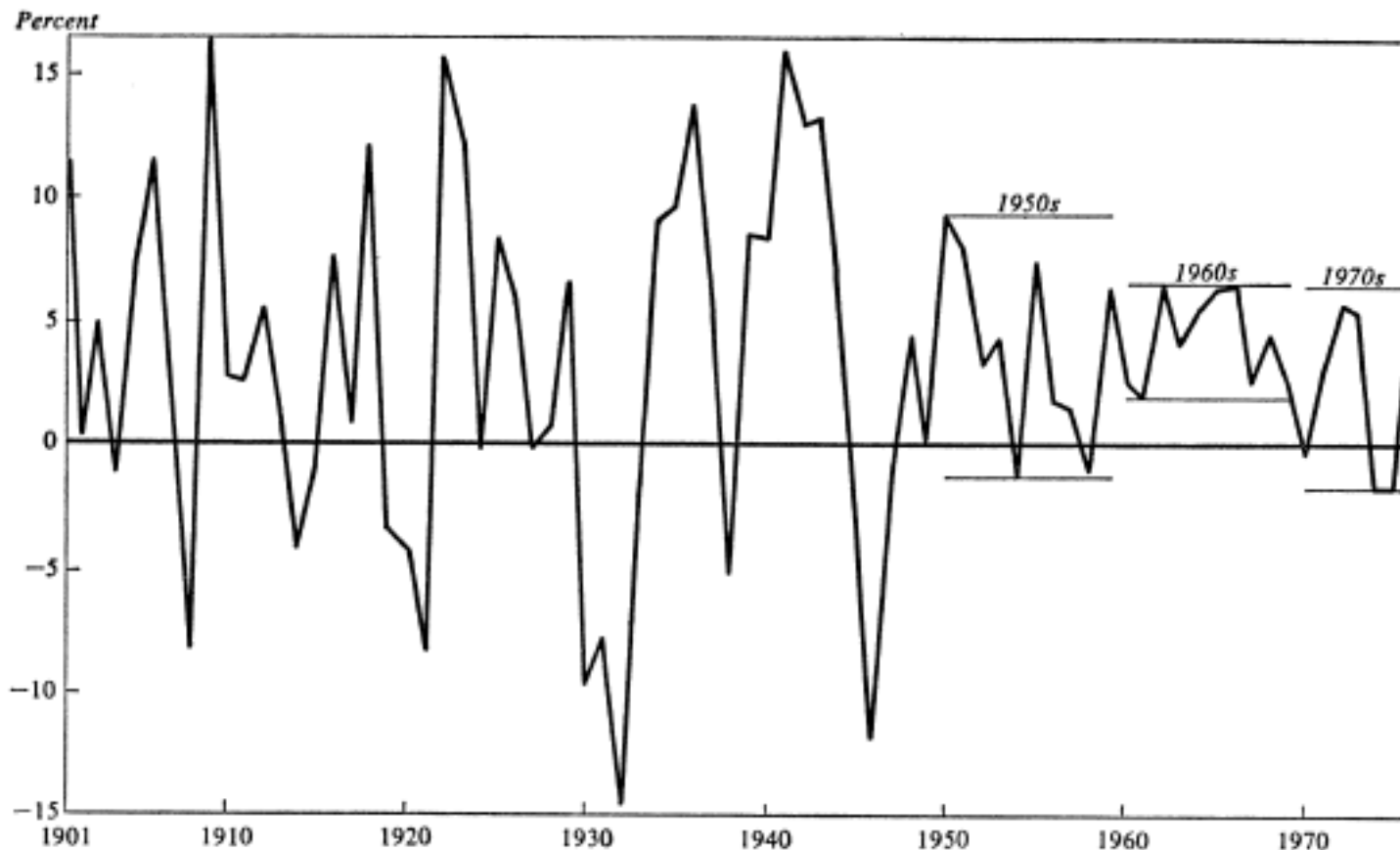


Source: U.S. Bureau of Economic Analysis

II. CHRISTINA ROMER: “IS THE STABILIZATION OF THE POSTWAR ECONOMY A FIGMENT OF THE DATA?”

Conventional GDP Data

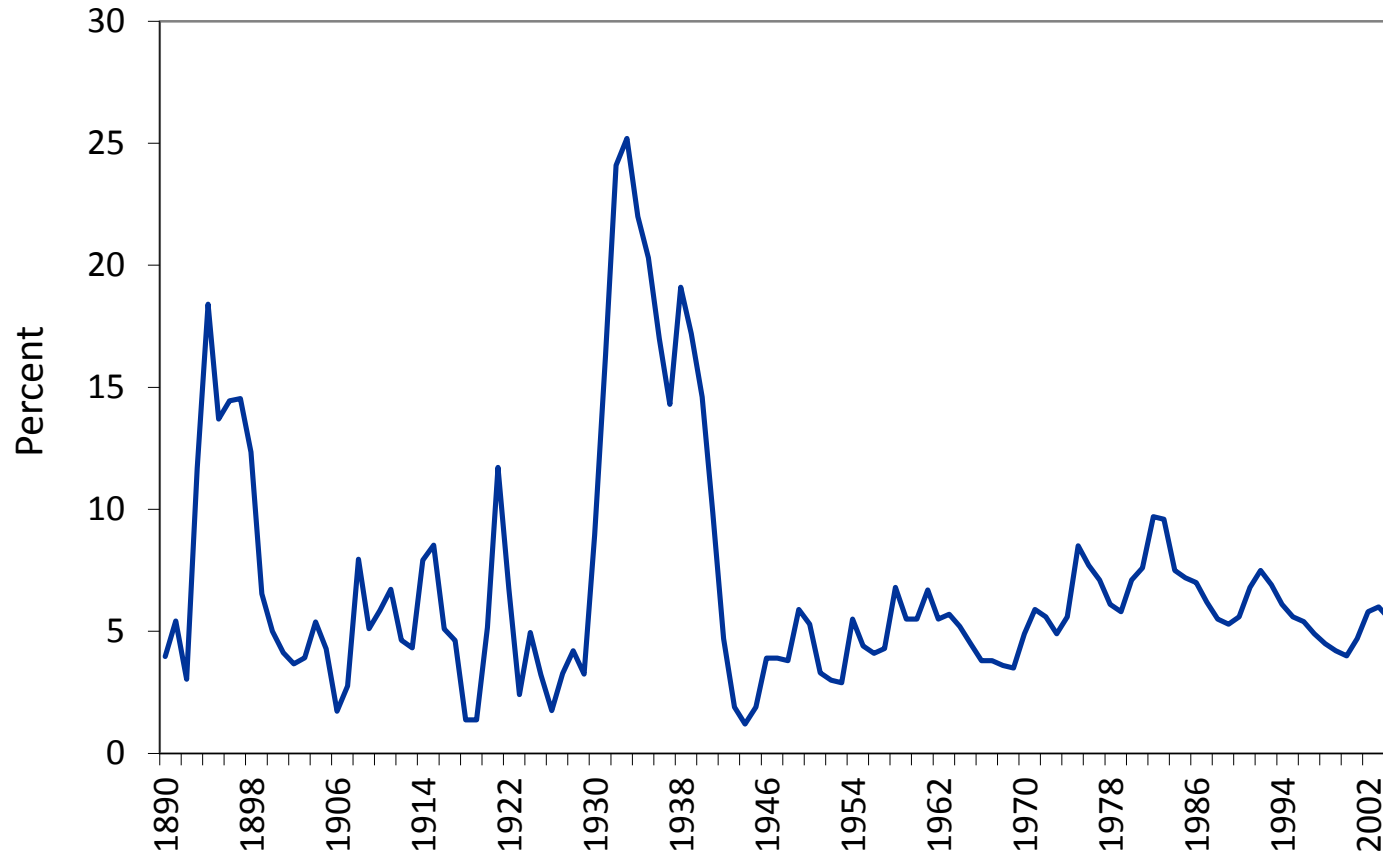
Figure 1. The Rate of Growth of Real Gross National Product, 1901-76



Sources: U.S. Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970*, pt. 1 (Government Printing Office, 1975), series F3; *Economic Report of the President, January 1977*, p. 188; *Survey of Current Business*, vol. 57 (July 1977), table 1.2.

From Martin Neil Baily, "Stabilization Policy and Private Economic Behavior"

Conventional Unemployment Data



From *Historical Statistics of the United States*

Differences between Frickey's Index for 1866–1914 and the Modern FRB Series

- Based on a smaller sample of goods.
- The goods included are systematically different from those in the modern index: much more skewed toward materials and basic commodities, and away from finished goods.
- Both features could make the series more volatile.

Romer's Methodology: “Reverse Alchemy”

- Create consistently bad series.
- Two variants:
 - Exact replication of Frickey's series for the post-1947 period.
 - A modern series that is qualitatively similar to Frickey's, but incorporates new materials.

Discussion and Concerns

- Might Romer's approach overestimate, or underestimate, how much Frickey's procedures mismeasure cyclical movements in the prewar era?
- Two general possibilities:
 - Especially: “structural change”—that is, perhaps the relationship between a Frickey-style IP series and true IP (or true GDP) is different in the two eras.
 - Also: imperfect replication.

Addressing the Concerns

Three general possibilities:

- Robustness to different (sensible) approaches.
- Making a case that addressing potential problems would only strengthen the conclusions.
- Examining auxiliary evidence.

Auxiliary Evidence Considered by Romer

- Comparison of the importance of materials in overall manufacturing production in prewar vs. postwar periods.
- Various fragments of data on inventory behavior in the prewar period.
- Examination of a more consistent series that is qualitatively similar to IP: commodity output.
- What other types of auxiliary evidence might be useful?

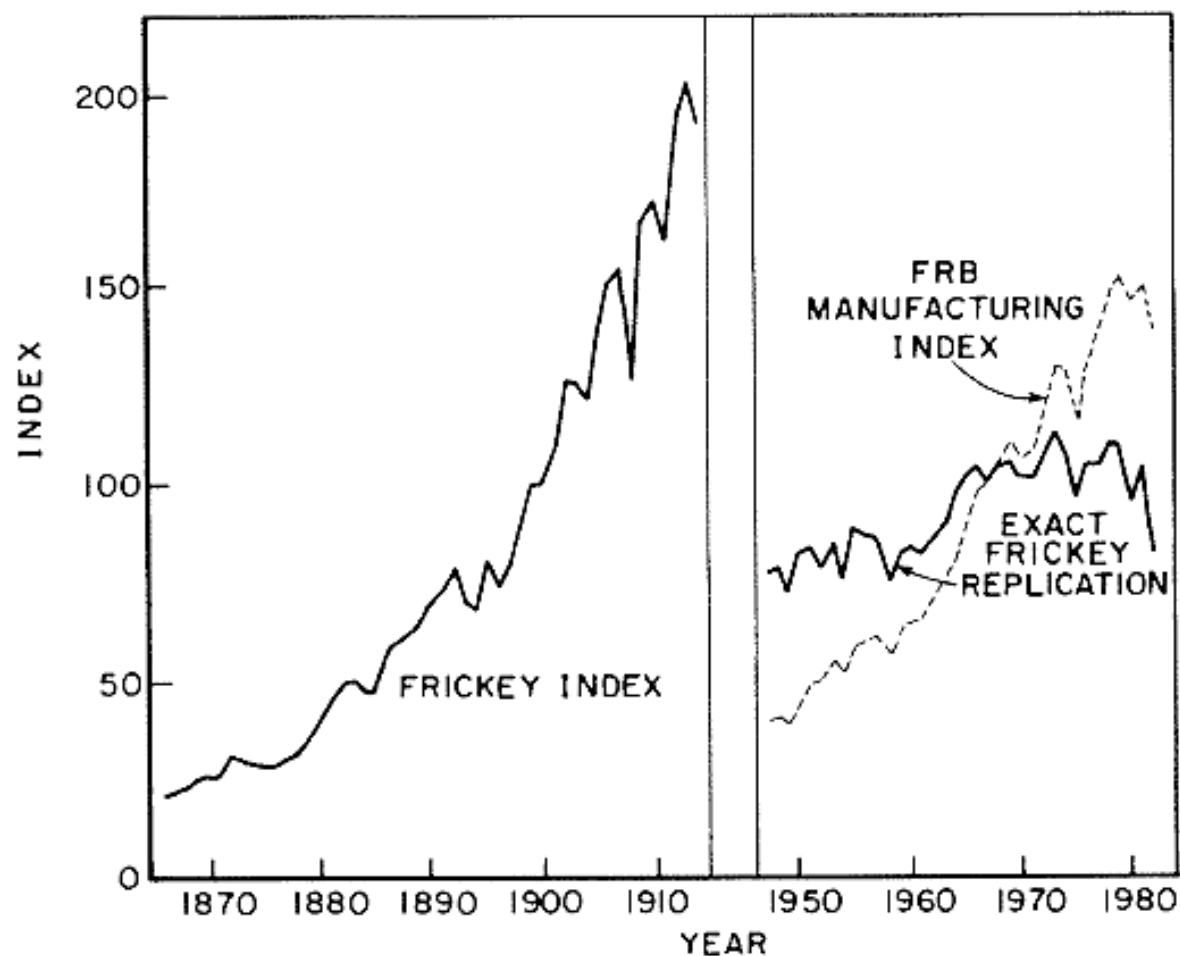


FIGURE 1. INDUSTRIAL PRODUCTION, 1866-1914
AND 1947-82

From Christina Romer, "Is the Stabilization of the Postwar Economy a Figment of the Data?"

TABLE 2—MEASURES OF VOLATILITY

Measure	Frickey (1866–1914)	Exact Replication (1947–82)	FRB Materials (1947–82)	FRB Manufacturing (1947–82)
Mean Cyclical Amplitude of Detrended Series ^a	.1398	.1319	.1342	.1081
Standard Deviation of Growth Rates	.0884	.0862	.0797	.0643
Standard Deviation of Deviations from Trend	.0830	.0762	.0728	.0636

^aTrend industrial production is calculated as the fitted value of a regression of the log of industrial production on a constant and a quadratic trend.

From Christina Romer, “Is the Stabilization of the Postwar Economy a Figment of the Data?”

Other Aspects of Romer's Analysis

- Significance tests.
- Implications for changes in the frequency of recessions and the persistence of fluctuations.
- Examines the importance of the behavior of materials inventories to the difference in the volatilities of the two postwar FRB series.

Implications of Findings

- Quality of the data matters.
- Depression stands out more.
- Why wasn't there a stabilization?
- What changed in the early 1980s?

III. JOSEPH DAVIS: “AN ANNUAL INDEX OF U.S. INDUSTRIAL PRODUCTION, 1790-1915”

Davis's Methodology

- Tries to create a consistently good series on industrial production over time.
- What are his criteria for including a component series?
 - Real quantities
 - Finished goods when possible
 - Long series

What are Davis's sources of data?

- Trade publications
- Government documents
- Firm records
- Collectors guides
- British Parliamentary Papers

Data Sources for Davis's Index of Industrial Production

Series 12: Farm machinery

Initial Coverage: 1790 (Product first commercially produced in the United States in 1833; earlier observations are recorded, by definition, as zero in the index).

Details: Direct measure. Units of reaping and harvesting machinery, including rakers, mowers, droppers, harvesters, binders; and steel plows. Author's tabulations from firm archives, published firm case studies, and private correspondence. Series records the output of four pioneer and primary farm-implement manufacturers: Obed Hussey, McCormick, International Harvester Company, and John Deere. Series possesses survivorship bias.

Series 13: Firearms

Initial Coverage: 1790 (Product first commercially produced in the United States in 1793; earlier observations are recorded, by definition, as zero in the index).

Details: Direct measure. Military and commercial small arms made (all models), by federal and state armories, contractors, and private firms. Author's tabulations from published and unpublished U. S. government records, firm archives, and published firm studies. Gunsmiths and firearm manufacturers represented in the component series account for approximately one-half of total U. S. firearm production.

Series 14: Fish curing

Initial Coverage: 1804

Details: Direct measure. Salted mackerel barrels inspected in Massachusetts (until 1877) and New England (thereafter), as reported in U. S. government publications. Nearly complete industry coverage.

Evaluation of Davis

- Impressive accomplishment.
- Are series representative or idiosyncratic?
- Has he dealt with the problem of over-reliance on inputs?
- Is it sensible to insist on long component series?
- Why not overlap with the FRB index?

TABLE II
A LIST OF INDEX COMPONENTS AND THEIR RELATIVE IMPORTANCE

Major industry groups Quantity-based index component	1850 weights (%)		1880 weights (%)	
	Industry	Series	Industry	Series
Chemical & Fuel Products	6.36		11.02	
Anthracite coal		2.39		3.48
Bituminous coal		1.24		4.78
Sperm oil refining		0.87		0.08
Whale oil refining		0.78		0.03
Salt production		0.48		0.28
Gunpowder and explosives		0.41		0.32
Dyeing chemicals		0.14		0.13
Whalebone processing		0.05		0.02
Crude petroleum		—		1.90
Ordnance & Accessories	0.34		0.24	
Firearms		0.34		0.24
Food & Kindred Products	10.87		13.12	
Milled wheat flour		8.23		6.86
Refined sugar consumption		1.28		2.09
Hog packing		0.81		2.66
Beef packing		0.36		1.20
Salted mackerel		0.10		0.26
Cleaned rice		0.09		0.05
Textiles & Textile Products	21.80		21.40	
Cotton consumption		21.47		20.03
Wool stockings		0.15		0.36
Mixed cloth regalia		0.09		0.06
Raw silk imports		0.09		0.96
Lumber & Wood Products	12.57		8.88	
Lumber shipments		12.57		8.88
Printing & Publishing	8.05		9.04	
Newspapers		8.05		9.04
Leather & Leather Products	13.12		8.04	
Sole leather		8.95		5.10
Leather hides		4.14		2.93
Boots and shoes, U. S. troops		0.03		0.01
Metals & Metal Products	12.93		13.07	
Pig iron production		8.13		7.33
Gold mining		2.66		0.61
Tinsmithing		1.30		1.72
Coppersmithing		0.47		0.85
Lead smelting		0.21		0.26
Die-sinking		0.12		0.07
Copper mining		0.06		0.44
Bessemer and open-hearth steel		—		1.61
Zinc production		—		0.17
Transport Equipment & Machinery	13.10		14.02	
Merchant ships		5.40		2.70
Locomotives		3.62		4.71
Reaping machinery; steel plows		2.80		5.88
U. S. Navy vessels		1.15		0.58
Hand fire engines		0.13		0.01
Steam fire engines		—		0.15
Musical & Scientific Instruments	0.85		1.16	
Pipe organs		0.66		0.77
Telescopes		0.19		0.08
Pocket watches		—		0.30

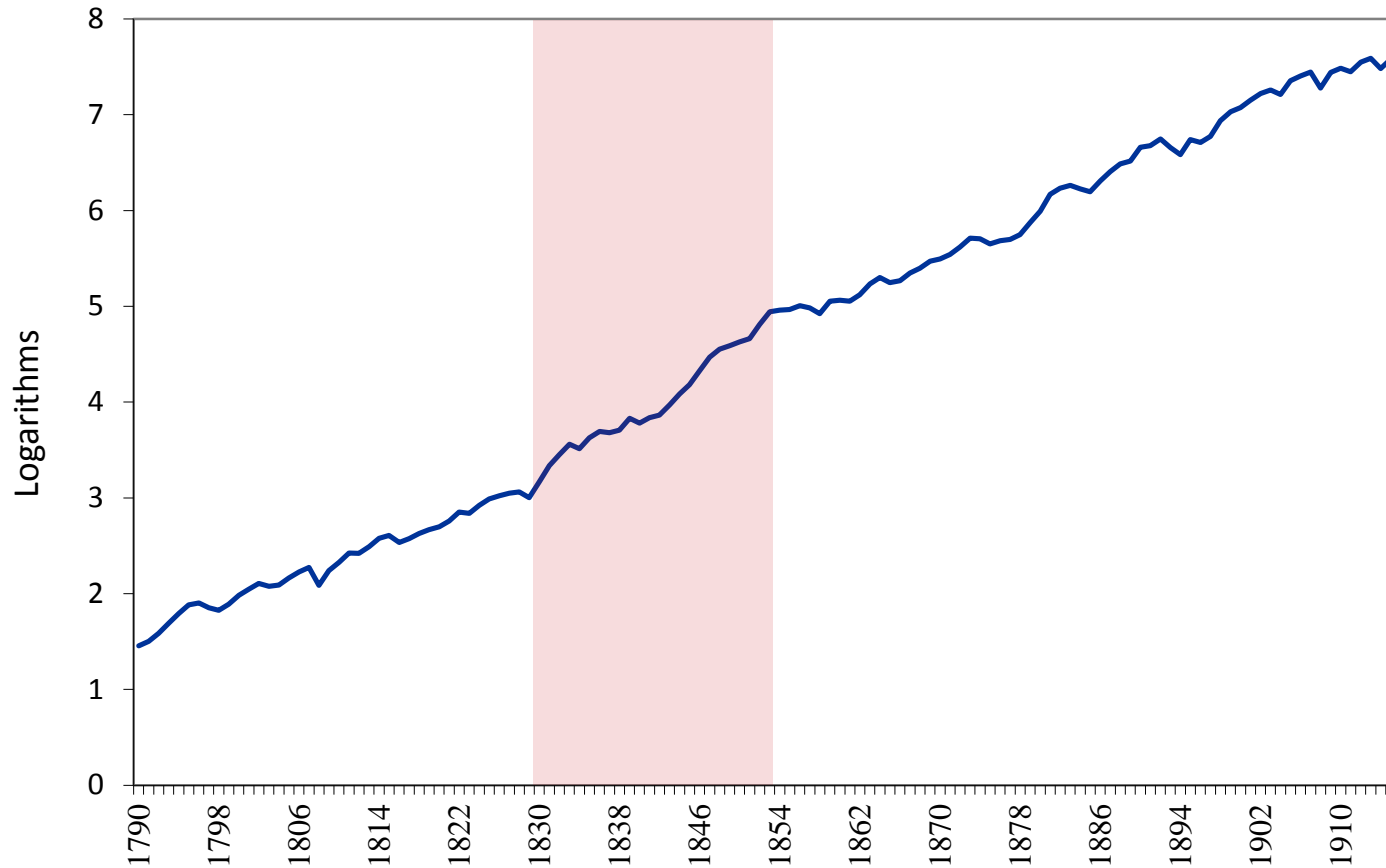
TABLE IV
POSTBELLUM INDEXES: COMPARISON OF COMPONENT MARKET STRUCTURE

Index:	New annual index		Frickey	Miron-Romer
Value-added base:	1849/50	1879/80	1899	1899
<i>Panel A. Component share (%) of index, by value added</i>				
Final products	35.1	34.7	11.7	15.4
Intermediates	21.5	17.8	23.5	9.3
Raw materials	43.4	47.6	64.9	75.4
<i>Panel B. Component share (%) of index, by number of series</i>				
Final products	55.3	53.5	25.0	23.1
Intermediates	13.2	14.0	15.0	7.7
Raw materials	31.6	32.6	60.0	69.2

Sources: Author's calculations based on information in Frickey [1947], Miron and Romer [1990], and Davis [2002, 2004a]. Components classified according to historical Federal Reserve market groups as defined in U. S. Board of Governors of the Federal Reserve System [1986].

From Joseph Davis, "An Annual Index of Industrial Production, 1790-1915"

Davis Index of Industrial Production



From Joseph Davis, "An Annual Index of Industrial Production, 1790-1915"

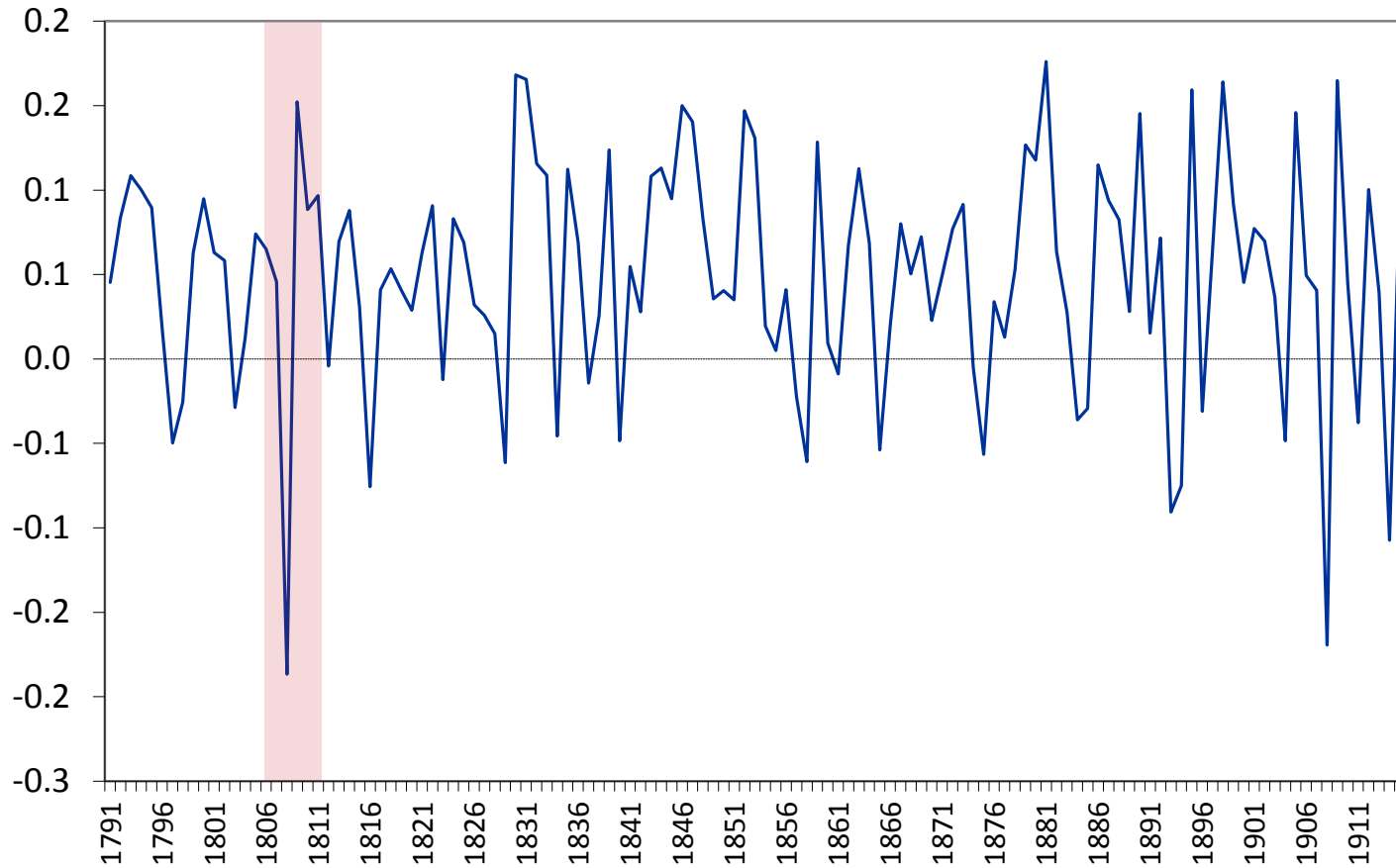
TABLE VI
ANTEBELLUM-POSTBELLUM INDEX VOLATILITY COMPARISONS

Index comparison		Antebellum period	Postbellum period	Equal means hypothesis		Equal variance hypothesis	
				<i>T</i> -test	<i>p</i> -value	Brown-Forsythe median W	<i>p</i> -value
<i>Panel A. Logarithmic growth rates, benchmark sample</i>							
1791–1860 vs. 1866–1915 <i>(excludes War of 1812)</i>	s.d.	6.64	7.39	0.40	0.69	0.53	0.59
	mean	5.18	4.66				
<i>Panel B. Alternative sample periods</i>							
1791–1860 vs. 1866–1915 <i>(includes War of 1812)</i>	s.d.	6.50	7.39	0.38	0.70	0.41	0.52
	mean	5.15	4.66				
1800–1849 vs. 1850–1899 <i>(19th century only)</i>	s.d.	6.71	6.59	0.39	0.70	0.19	0.66
	mean	5.40	4.88				
<i>Panel C. Alternative index construction</i>							
Attrition-free index (2 variants)							
Years with all series	s.d.	7.35	6.70	0.03	0.98	0.11	0.90
	mean	5.87	5.82				
Series with all years	s.d.	7.06	7.05	0.06	0.95	0.08	0.78
	mean	5.08	4.99				
Calomiris-Hanes (A) <i>(Replication)</i>	s.d.	14.94	10.97	(0.08)	0.94	2.62	0.11*
	mean	6.25	6.52				
Calomiris-Hanes (B) <i>(Extension)</i>	s.d.	10.90	10.95	0.00	1.00	1.05	0.35
	mean	6.19	6.19				

Unless otherwise noted, summary statistics represent log first differences of index, expressed in percentages.

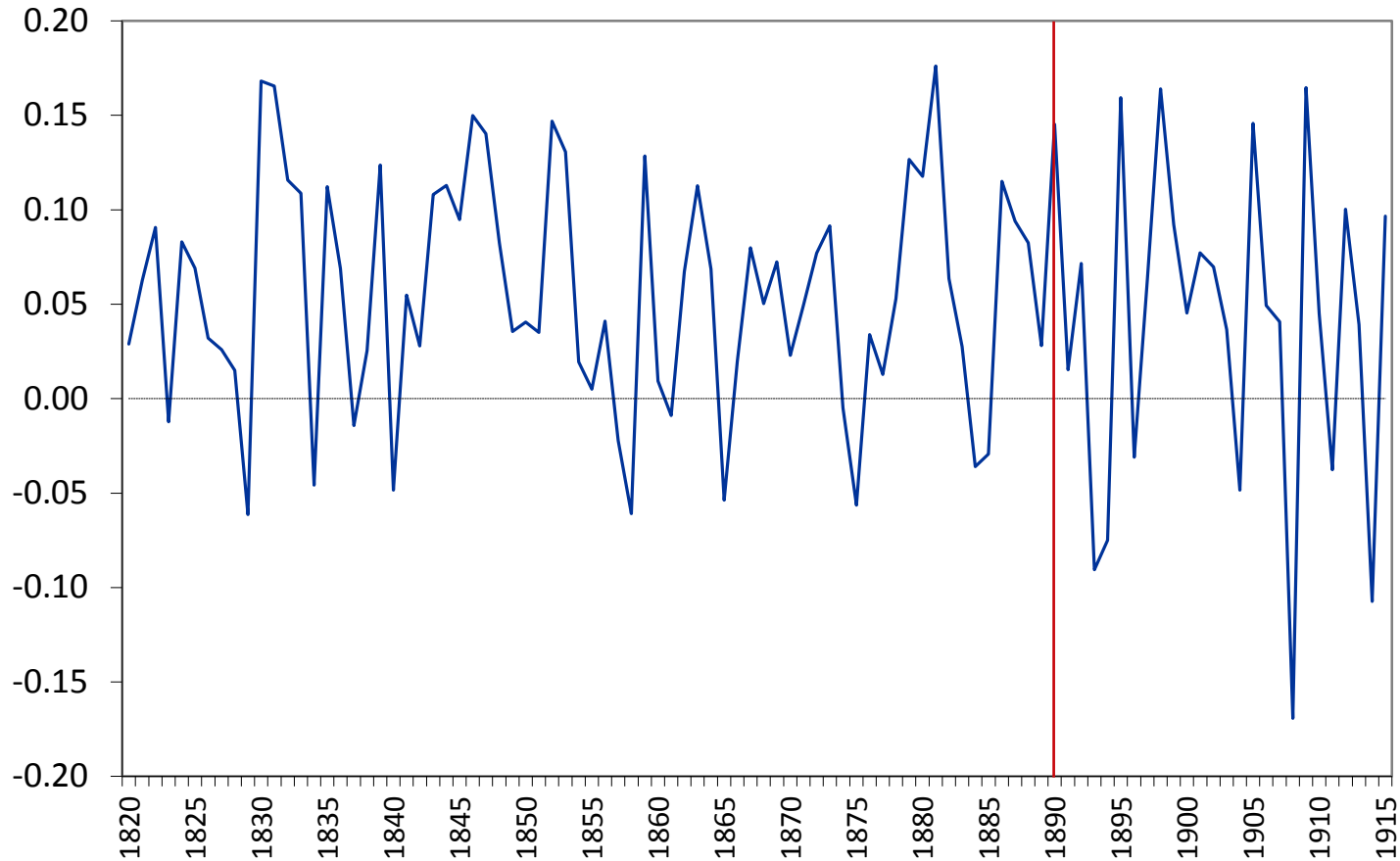
From Joseph Davis, “An Annual Index of Industrial Production, 1790-1915”

Percentage Change in Industrial Production



From Joseph Davis, "An Annual Index of Industrial Production, 1790-1915"

Percentage Change in Industrial Production

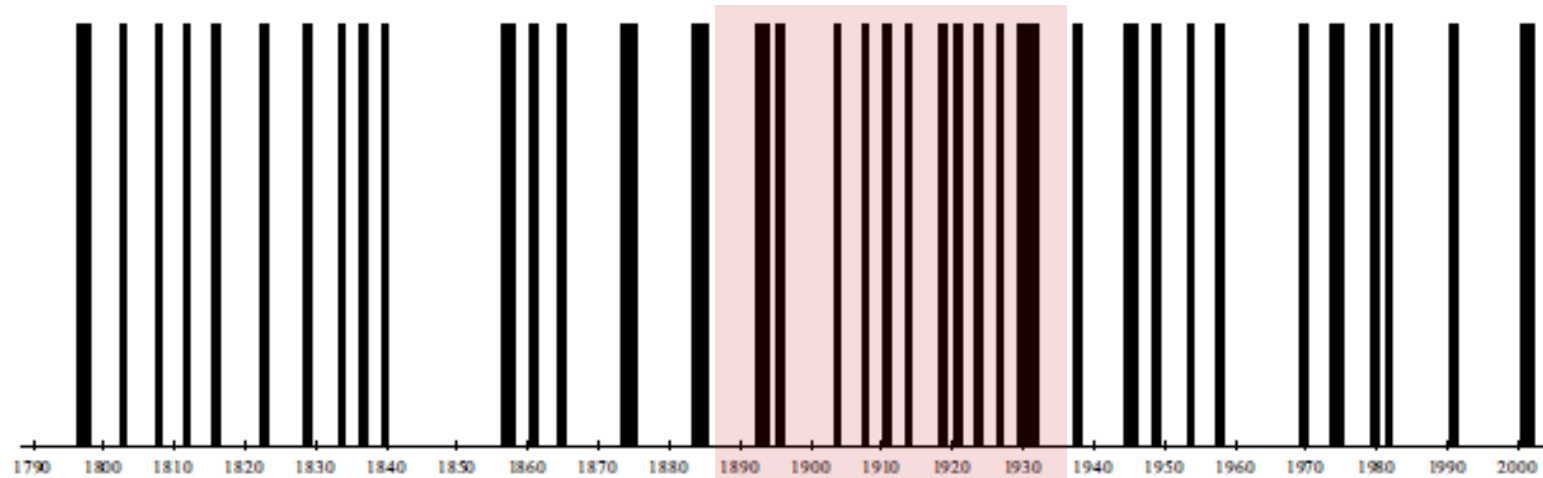


Standard Deviation

1820-1889 0.060

1890-1915 0.089

Alternative Recessions (*peak to trough*)



Alternative recessions defined solely on the basis of declines in annual industrial production

FIGURE 3

U.S. RECESSIONS SINCE THE 1790s: THE NBER CHRONOLOGY VERSUS AN ALTERNATIVE SET BASED ON ANNUAL INDUSTRIAL PRODUCTION DATA

From Joseph Davis, "An Annual Index of Industrial Production, 1790-1915"

Implications of Findings

- Increasing frequency of cycles after 1890 may reflect structural changes, such as the emergence of price stickiness.
- Changes in volatility may reflect the emergence of demand-driven recessions.
- May affect view of impact of panics in the 19th c.

TABLE 6
Major Panics and Downturns

Panic	Percent Change in Davis Index
1833	-4.5% from 1833 to 1834
1837	-1.4% from 1837 to 1838
1839	-4.7% from 1839 to 1840
1857	-8.0% from 1856 to 1858
1873	-6.0% from 1873 to 1875
1893	-15.3% from 1892 to 1894
1907	-15.6% from 1907 to 1909

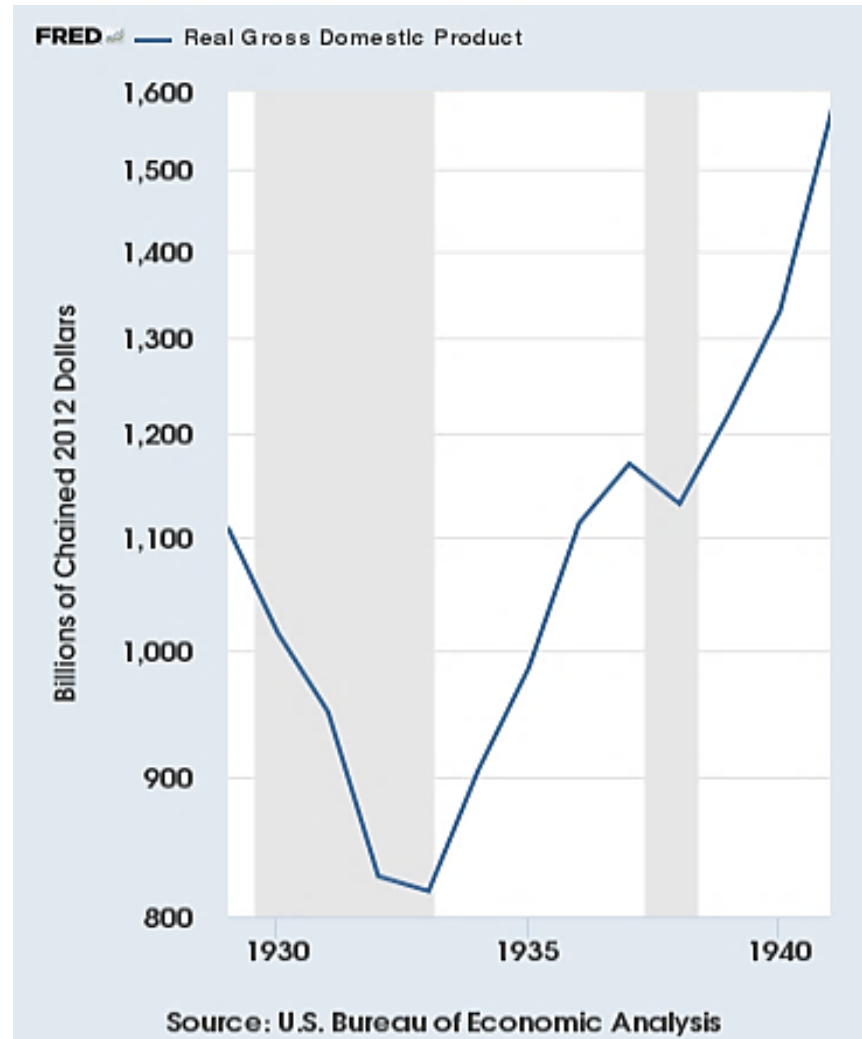
From Andrew Jalil, "A New History of Banking Panics in the United States, 1825-1929: Construction and Implications"

Strategies for Dealing with a Lack of Consistent Time-Series Data

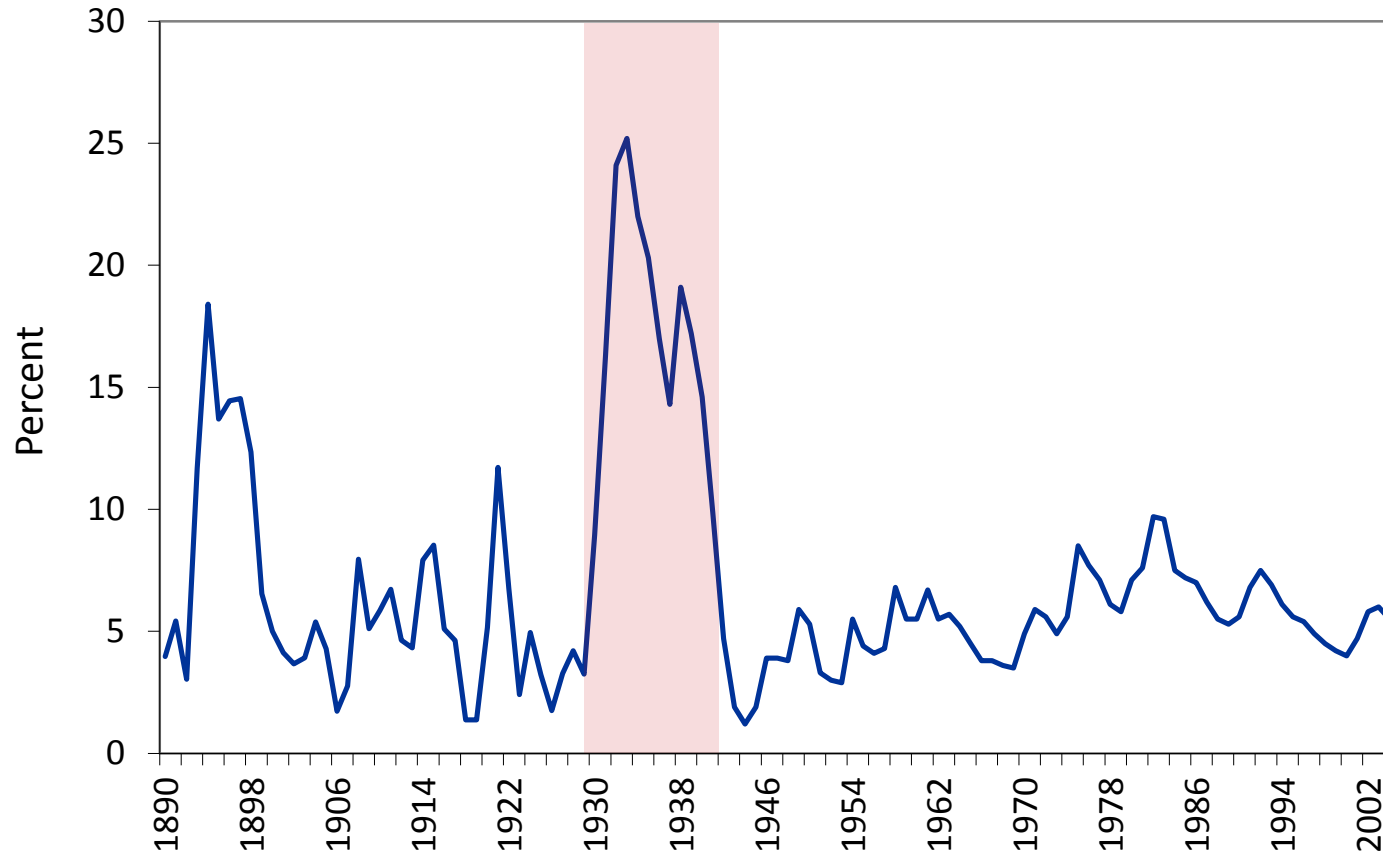
- Use consistently flawed data.
- Be clever in finding more data.
- Use a piece of the aggregate that might be consistent over time (pig iron production).
- Use an indirect indicator that is measured better (stock prices).
- Look at data for other countries that might be better.

IV. ROBERT MARGO: “THE MICROECONOMICS OF DEPRESSION UNEMPLOYMENT”

The Great Depression and Recovery



Conventional Unemployment Data



From Historical Statistics of the United States

TABLE 3
UNEMPLOYMENT RATES
STANDARD AND CORRECTED DATA, 1929–43
(%)

YEAR	UNEMPLOYMENT RATES			
	Lebergott (14)	BLS (15)	Corrected Lebergott (16)	Corrected BLS (17)
1929.....	3.2	3.2	3.2	3.2
1930.....	8.9	8.7	8.9	8.7
1931.....	16.3	15.9	15.7	15.3
1932.....	24.1	23.6	22.9	22.5
1933.....	25.2	24.9	20.9	20.6
1934.....	22.0	21.7	16.2	16.0
1935.....	20.3	20.1	14.4	14.2
1936.....	17.0	16.9	10.0	9.9
1937.....	14.3	14.3	9.2	9.1
1938.....	19.1	19.0	12.5	12.5
1939.....	17.2	17.2	11.3	11.3
1940.....	14.6	14.6	9.5	9.5
1941.....	9.9	9.9	6.0	6.0
1942.....	4.7	4.7	3.1	3.1
1943.....	1.9	1.9	1.8	1.8

From Michael Darby, “Three-and-a-half Million U.S. Employees Have Been Mis-
laid: Or, An Explanation of Unemployment, 1934–1941.”

TABLE 1
CHARACTERISTICS OF THE UNEMPLOYED: SELECTED SURVEYS, 1930–1938

(A) Unemployment Rates by Age (%)						
	15–19	20–24	25–34	35–44	45–54	55–64
Pennsylvania, 1934	60.0	36.0	22.0	19.0	22.0	27.0
United States, 1937	26.0	18.0	13.0	13.0	16.0	19.0

(C) U.S. Industry Unemployment Rates (%)			
Industry	Oct. 1930	Mar. 1933	May 1938
Agriculture	8.2	14.5	10.2
Manufacturing	17.7	40.3	27.7
Construction	13.1	73.3	55.0
Transportation	9.1	39.7	37.1
Public Utilities	4.3	29.0	27.2
Trade/Finance	4.7	22.9	18.5
Services	3.7	16.2	1.8

From Robert Margo, “The Microeconomics of Depression Unemployment.”

TABLE 1
CHARACTERISTICS OF THE UNEMPLOYED: SELECTED SURVEYS, 1930–1938

(D) Duration of Unemployment Among Currently Unemployed (%)				
	Buffalo		Massachusetts	
Weeks	1929	1930	Months	1934
<10	68.4	53.2	0–3	11.3
10–19	12.3	17.9	3–6	12.1
20–29	6.2	14.3	6–12	14.0
30–39	3.1	7.9	≥12	62.6
40–51	0.7	5.6		
≥52	9.3	21.1		

Sources: New York Department of Labor Special Bulletin No. 167, “Unemployment in Buffalo, November 1930” (Albany, 1930); Palmer, “Employment and Unemployment”; and U.S. Federal Works Agency, “Report on Public Assistance,” typescript (New York, 1939).

From Robert Margo, “The Microeconomics of Depression Unemployment.”

TABLE 2
CHARACTERISTICS OF UNEMPLOYED NONFARM MALES, AGES 14–64 (MAR. 1940)

	(A) By Employment Status			Unemployment Rate (%) ^a	
	Employed	Unemployed	Work Relief	Darby	BLS
Sample				9.4	14.7
Age (%)					
14–24	16.0	13.2	33.6	8.0	12.9
25–34	31.3	22.7	29.8	7.0	12.1
35–44	25.0	25.6	28.1	9.6	15.5
45–54	18.1	22.4	17.3	11.4	16.4
55–64	9.6	16.1	11.2	14.7	20.5
Married (%)	67.9	56.0	73.0	7.8	13.6
Nonwhite (%)	7.7	7.4	16.2	8.6	19.2
Foreign (%)	13.7	19.5	11.2	13.1	17.3
Years of schooling	9.5	8.1	7.6		
<i>N</i>	3,146	348	196		

From Robert Margo, “The Microeconomics of Depression Unemployment.”

TABLE 2
CHARACTERISTICS OF UNEMPLOYED NONFARM MALES, AGES 14-64 (MAR. 1940)

Occupation (%)	(A) By Employment Status			Unemployment Rate (%) ^a	
	Employed	Unemployed	Work Relief		
				Darby	BLS
Professional/Technical	6.4	1.7	4.1		
Managerial	8.0	2.6	2.6		
Clerical/Sales	17.3	10.9	7.1		
Skilled	19.1	23.0	15.3		
Semiskilled	25.3	25.9	15.8		
Service	12.8	10.6	5.1		
Unskilled	11.1	25.3	50.0		
<i>N</i>	3,146	348	196		

From Robert Margo, "The Microeconomics of Depression Unemployment."

TABLE 3
THE LONG-TERM UNEMPLOYED ON WORK RELIEF

(A) Weeks Worked in 1939: Nonfarm Males on Work Relief in 1940 with 65 or More Weeks of Unemployment					
	Weeks Worked				
	$\leq x < 13$	$13 \leq x < 27$	$28 \leq x < 39$	$39 \leq x < 51$	52
Percentage <i>N</i> = 370	7.0	21.4	22.2	25.6	23.8

From Robert Margo, "The Microeconomics of Depression Unemployment."

Narrative Evidence

Why do we want to hold onto these jobs? Well, you know, we know all the time about persons who are on direct relief . . . just managing to scrape along. . . . My advice, Buddy, is better not take too much of a chance. Know a good thing when you got it.¹⁴

¹⁴ Quoted in E. W. Bakke, *The Unemployed Worker* (New Haven, 1940), pp. 421–22.

From Robert Margo, “The Microeconomics of Depression Unemployment.”

Margo's Simple Empirical Exercise

- Margo regresses a 0-1 variable for whether an individual is long-term unemployed (not on work relief) on state employment growth. Does the same thing for a 0-1 variable for whether an individual is long-term unemployed (on work relief).
- He wants to interpret it as showing how long-term unemployment (of the two types) changes with aggregate demand.

TABLE 3
THE LONG-TERM UNEMPLOYED ON WORK RELIEF

(C) Coefficients of Employment Growth:^c Logistic Regressions of the Probability of Long-Term Unemployment

	<u>Not on Work Relief</u>	<u>On Work Relief</u>
β	-0.85 ^d	-0.20

^c Employment growth means the percentage of growth in employment in the 1940 state of residence from 1930 to 1940; see John Joseph Wallis, "Employment in the Great Depression: New Data and Hypotheses," *Explorations in Economic History*, 26 (Jan. 1989), pp. 45-72.

^d Significant at the 5 percent level.

From Robert Margo, "The Microeconomics of Depression Unemployment."

Does the Empirical Exercise Make Sense?

- Could there be omitted variable bias? (States with more relief jobs had faster employment growth.)
- Are the two groups of long-term unemployed otherwise similar?
- Are the differences statistically significant?

TABLE 3
THE LONG-TERM UNEMPLOYED ON WORK RELIEF

(B) Characteristics of Long-Term Unemployed				
	Not on Work Relief ^a		On Work Relief ^b	
	Mean	σ	Mean	σ
Age (%)				
25–34	0.21	0.41	0.19	0.39
35–44	0.29	0.46	0.31	0.46
45–54	0.20	0.40	0.28	0.45
55–64	0.21	0.41	0.13	0.33
Married	0.54	0.50	0.78	0.41
Nonwhite	0.10	0.30	0.12	0.32
Foreign	0.26	0.44	0.07	0.26
Years of schooling	7.59	3.57	7.40	3.41
Location				
Midwest	0.26	0.44	0.39	0.49
South	0.07	0.26	0.21	0.41
West	0.06	0.24	0.13	0.34
Urban	0.94	0.24	0.73	0.44
<i>N</i>	179		196	

Implications of Findings

- Micro data on unemployment may suggest that people on relief jobs should be considered employed (not unemployed).
- This may help explain (some of) the anomalous relationship between unemployment, wages, and output growth in the Depression.