Economics 210c/236a
Fall 2011

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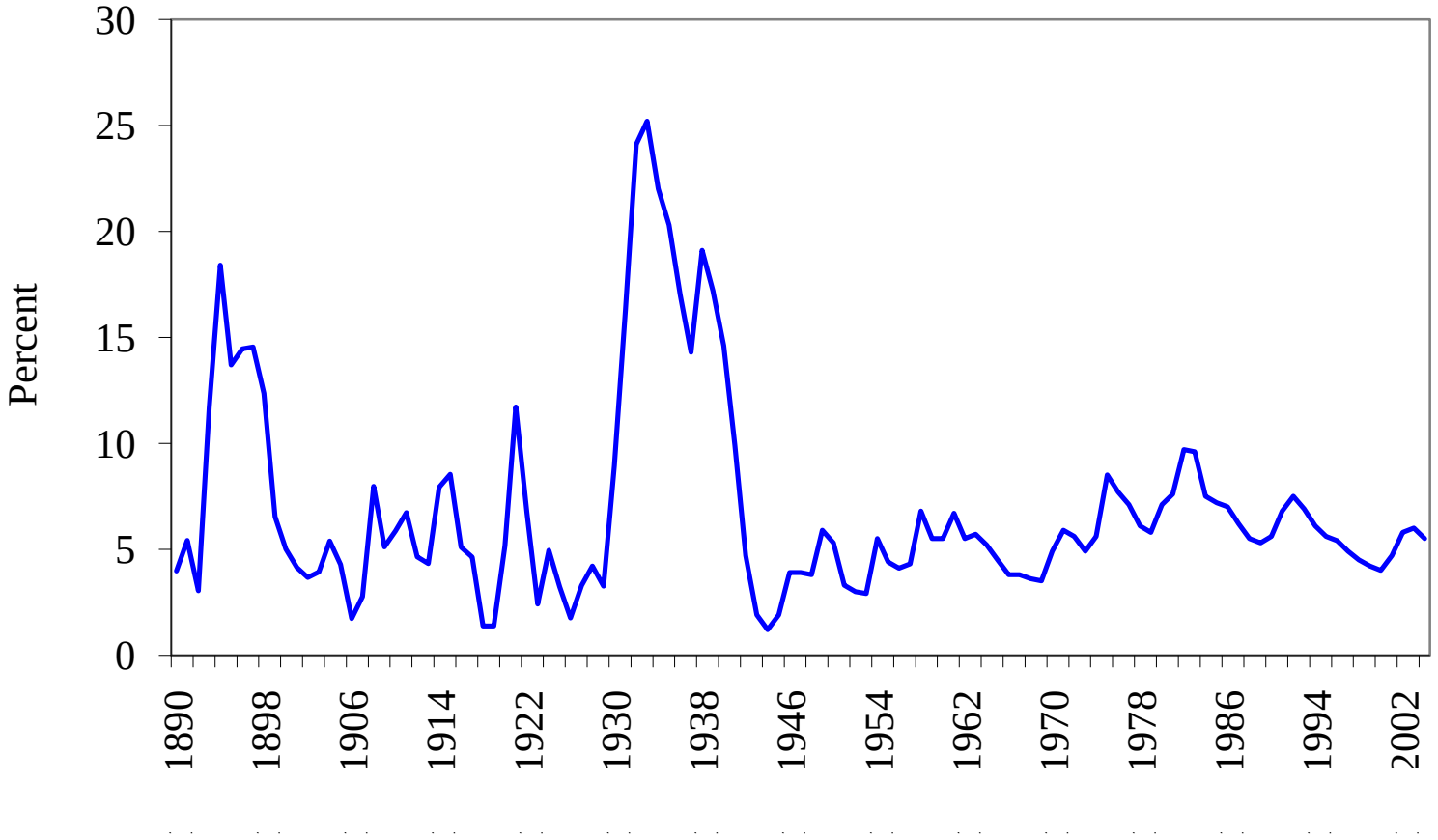
LECTURE 1
Overview of U.S. Macroeconomic History and Data

August 31, 2011

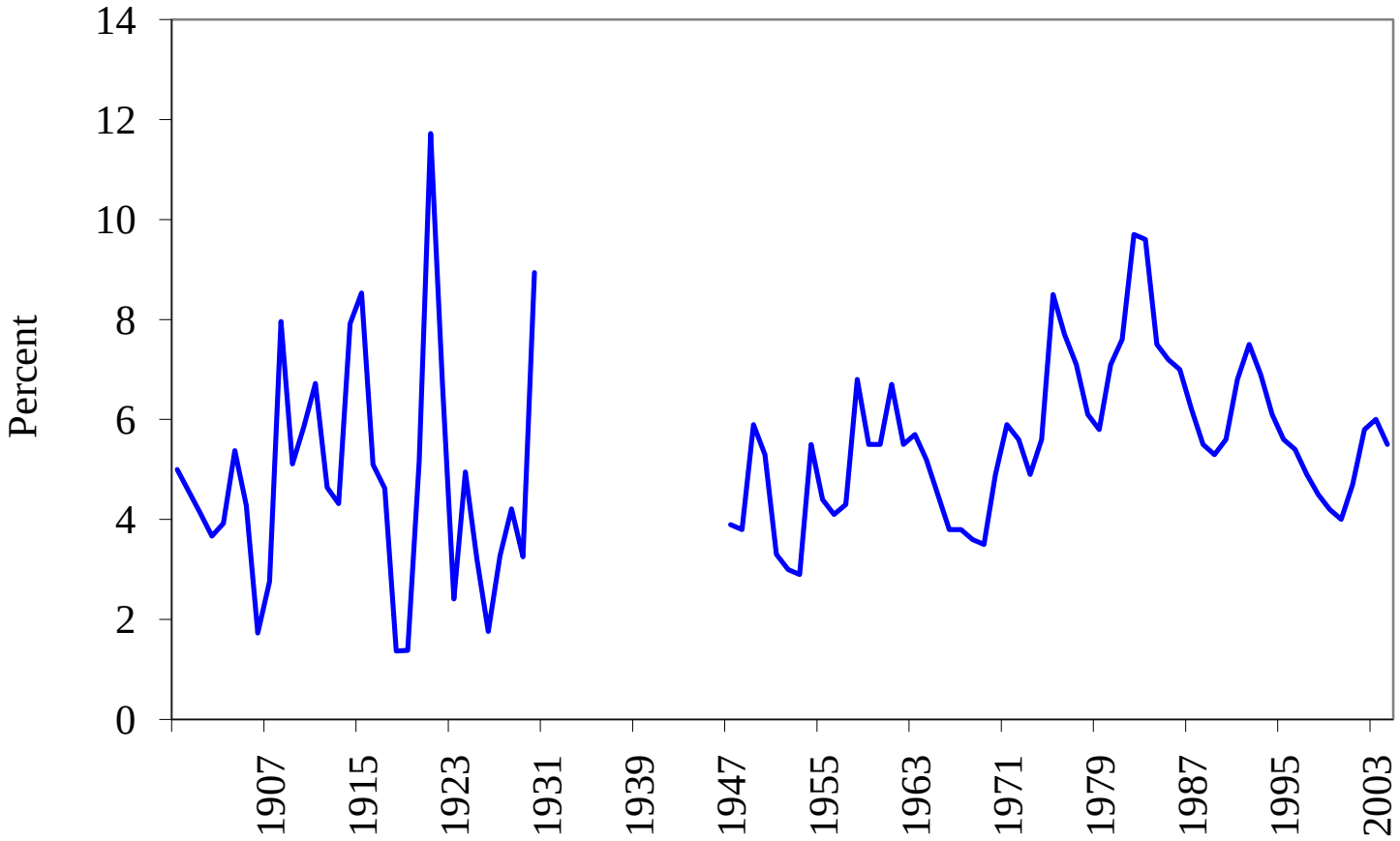
I. Christina Romer: "Spurious Volatility in History Unemployment Data"

Inconsistent Unemployment Data



From *Historical Statistics of the United States*

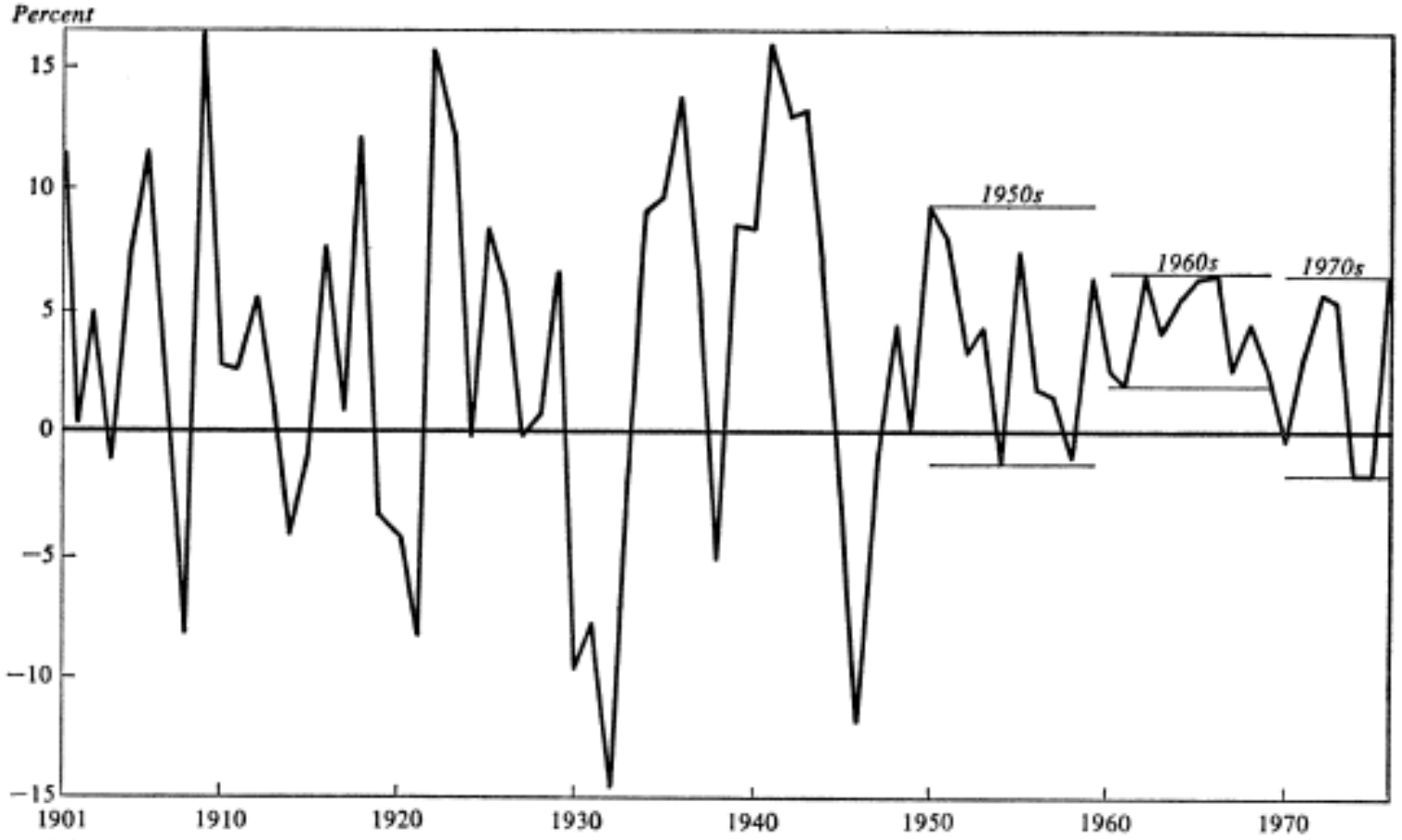
Inconsistent Unemployment Data



From *Historical Statistics of the United States*

Inconsistent 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"

Lebergott's Methodology

Unemployed = Labor Force – Employed

- Labor force is overestimated in recessions.
- Employment is underestimated.
- So unemployment is overestimated in recessions.
- Just the opposite in booms.

More Consistent Unemployment Data

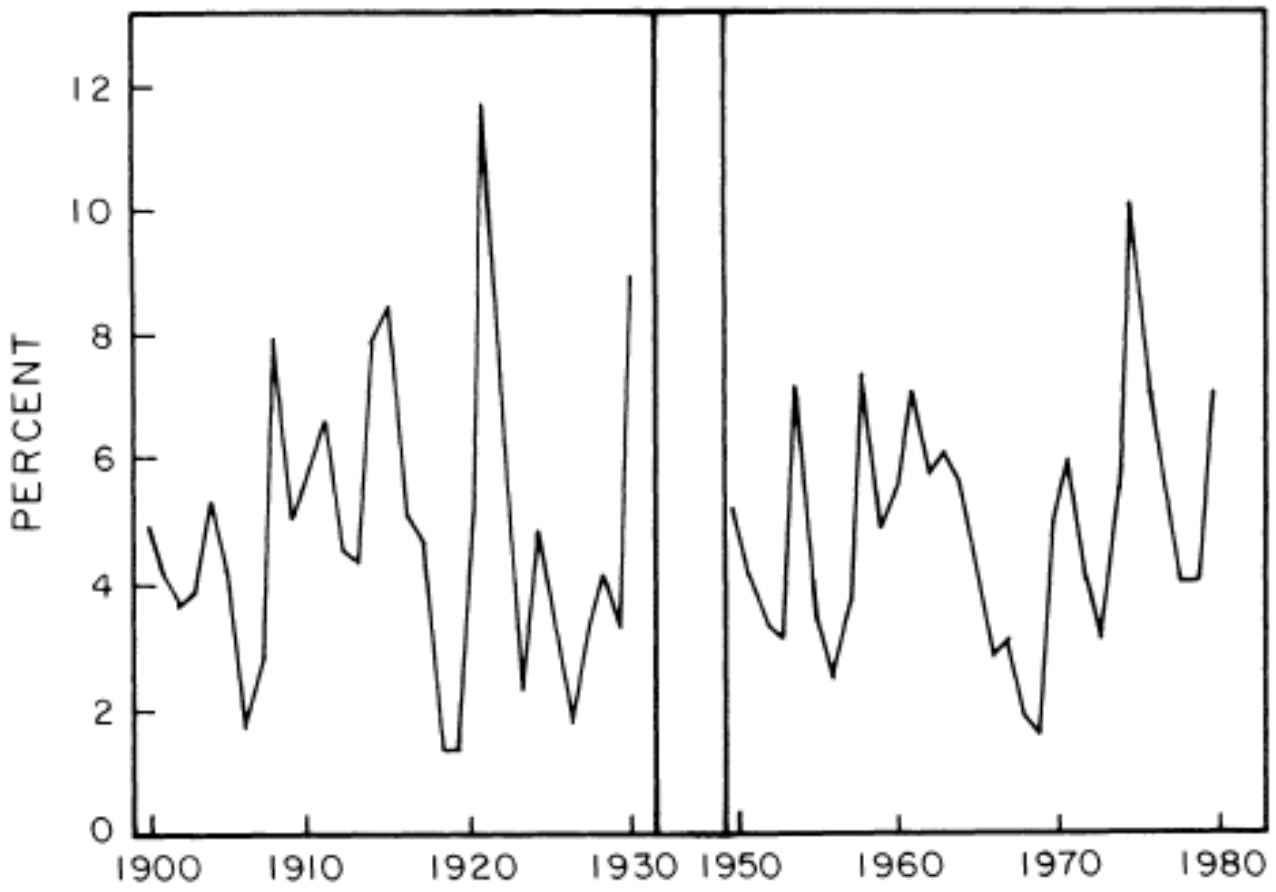


FIG. 1.—Consistent unemployment rate series. The series for 1900–1930 is Lebergott's unemployment rate series. The series for 1950–80 is the constructed unemployment series *UI*50.

From Christina Romer, "Spurious Volatility in Historical Unemployment Data"

TABLE 4

Standard Deviations

Period	Series	Standard Deviation*
1900–1930	*U*LEB	2.38
1948–78	*UI*48	2.19
1949–79	*UI*49	2.48
1950–80	*UI*50	1.90
1951–81	*UI*51	1.98
1952–82	*UI*52	2.14
1948–82	*UA*	1.58

* The standard deviation of the level of the unemployment rate around its mean.

From Christina Romer, ”Spurious Volatility in Historical Unemployment Data”

Evaluation of Romer

Implications of Findings

- Depression stands out more.
- Why wasn’t there a stabilization?

II. Joseph Davis: "An Annual Index of U.S. Industrial Production, 1790-1915"

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.

TABLE II

A List of Index Components and Their Relative Importance

Major industry groups	1850 weights (%)		1880 weights (%)	
Quantity-based index component	**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

Evaluation of Davis

TABLE IV

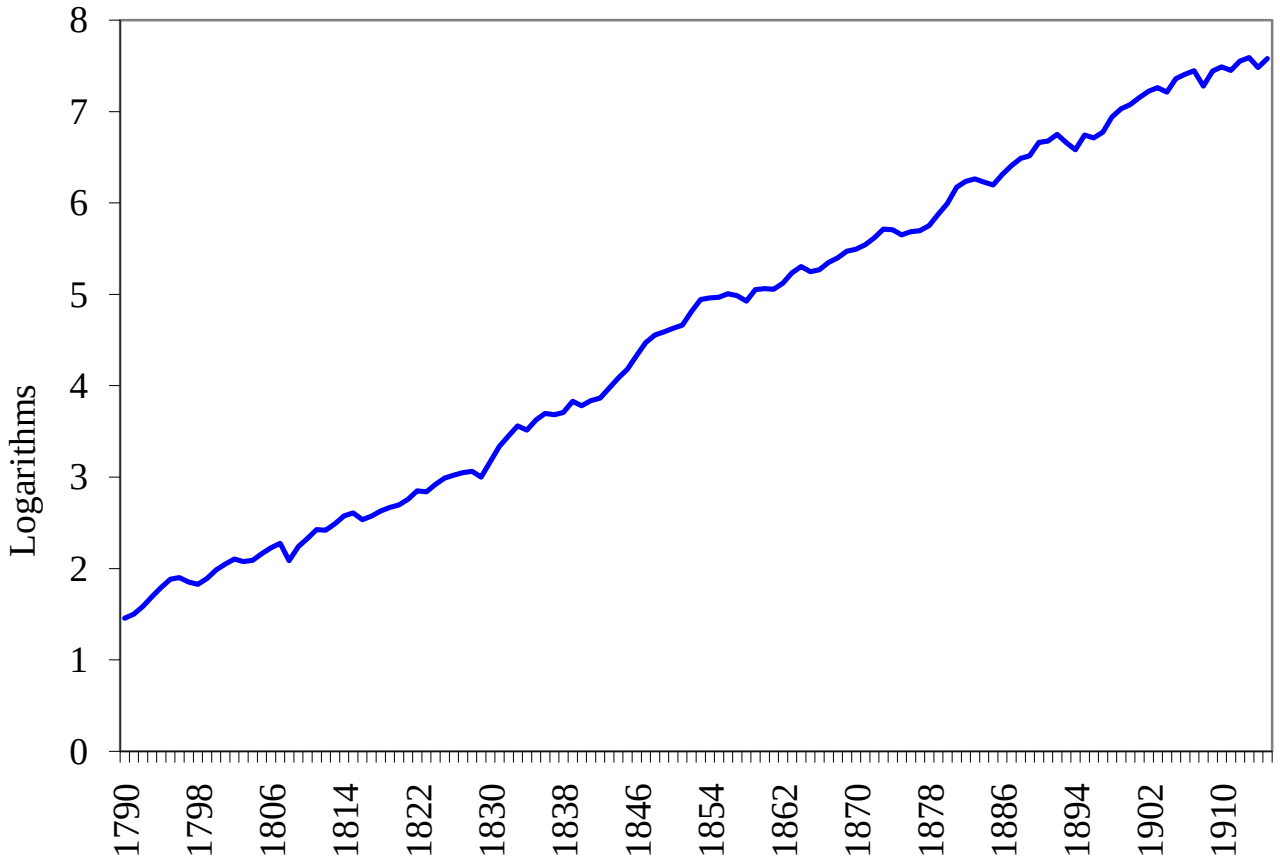
POSTBELLUM INDEXES: COMPARISON OF COMPONENT MARKET STRUCTURE

Index:	New annual index		Frickey	Miron-Romer
Value-added base:	1849/50	1879/80	1899	1899
Panel A. Component share (%) of index, by value added				
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
Panel B. Component share (%) of index, by number of series				
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

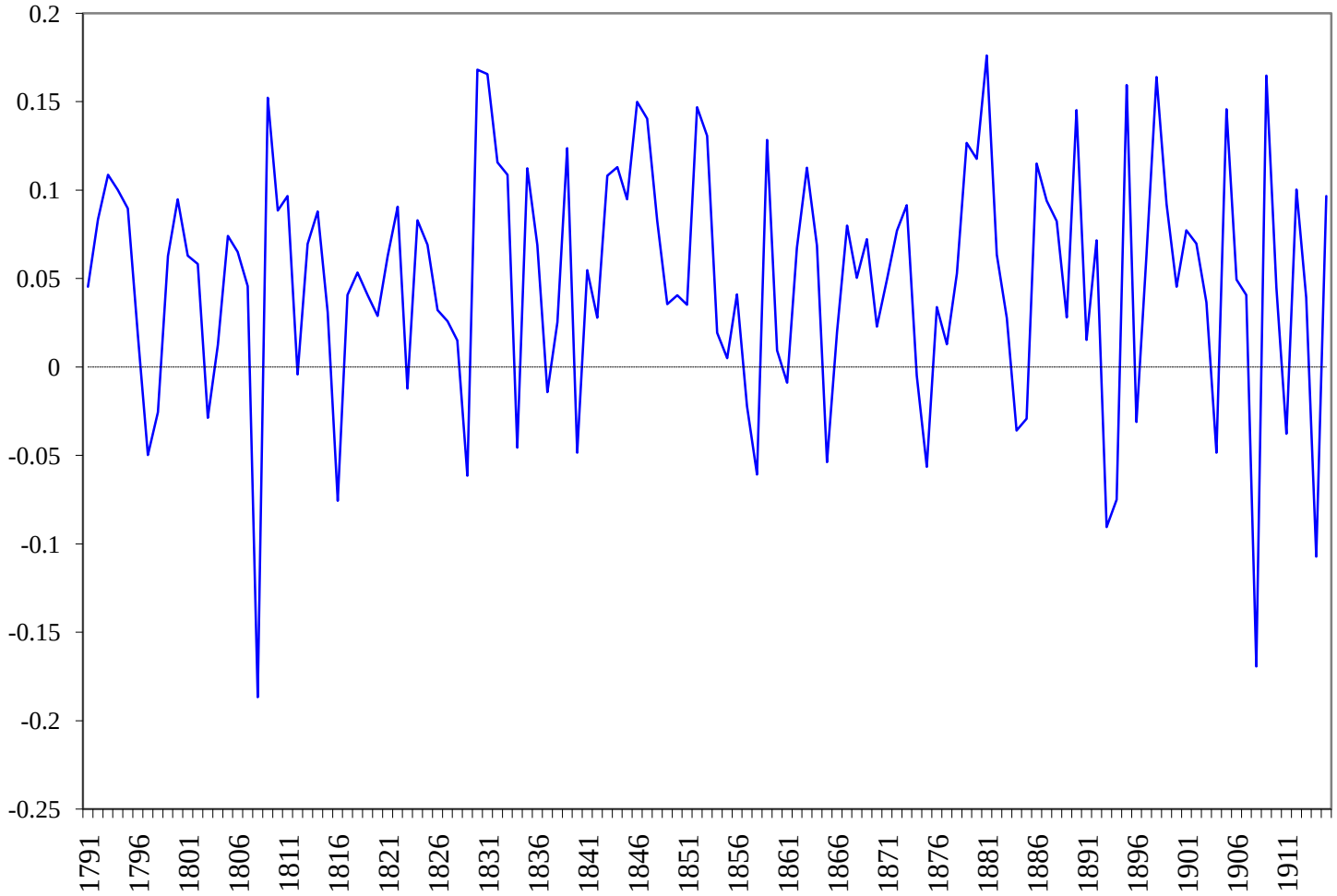
ANTEBELLUM-POSTBELLUM INDEX VOLATILITY COMPARISONS

Index comparison		Antebellum period	Postbellum period	Equal means hypothesis: *T*-test	Equal means hypothesis: *p*-value	Equal variance hypothesis: **Brown-Forsythe median W**	Equal variance hypothesis: *p*-value
Panel A. Logarithmic growth rates, benchmark sample							
1791–1860 vs. 1866–1915	**s.d.**	**6.64**	**7.39**	0.40	0.69	0.53	0.59
(*excludes War of 1812*)	mean	5.18	4.66				
Panel B. Alternative sample periods							
1791–1860 vs. 1866–1915	**s.d.**	**6.50**	**7.39**	0.38	0.70	0.41	0.52
(*includes War of 1812*)	mean	5.15	4.66				
1800–1849 vs. 1850–1899	**s.d.**	**6.71**	**6.59**	0.39	0.70	0.19	0.66
(*19th century only*)	mean	5.40	4.88				
Panel C. Alternative index construction							
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)	**s.d.**	**14.94**	**10.97**	(0.08)	0.94	**2.62**	**0.11***
(*Replication*)	*mean*	*6.25*	*6.52*				
Calomiris-Hanes (B)	**s.d.**	**10.90**	**10.95**	0.00	1.00	1.05	0.35
(*Extension*)	*mean*	*6.19*	*6.19*				

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

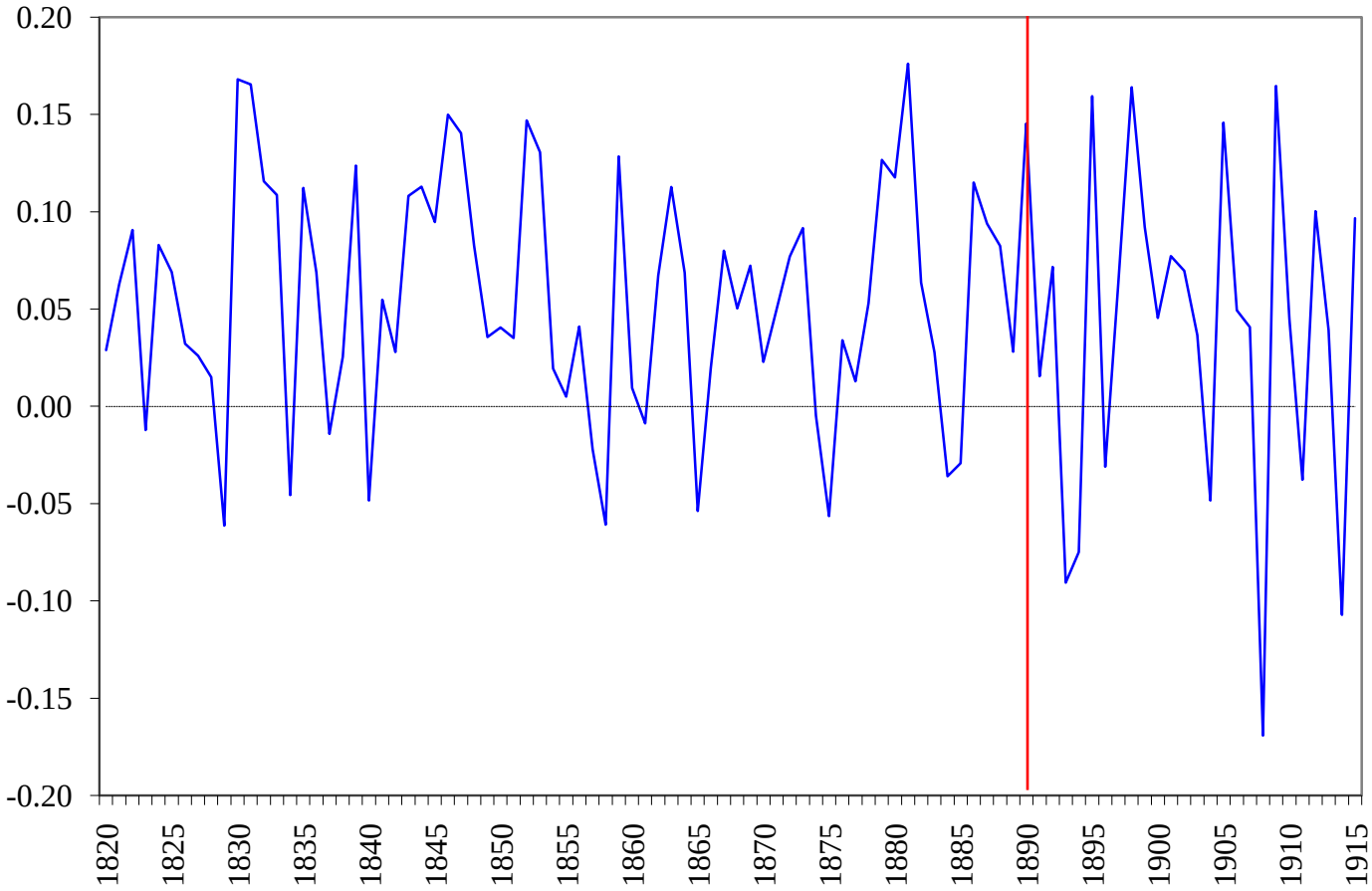
From Joseph Davis, “An Annual Index of Industrial Production, 1790-1915”

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

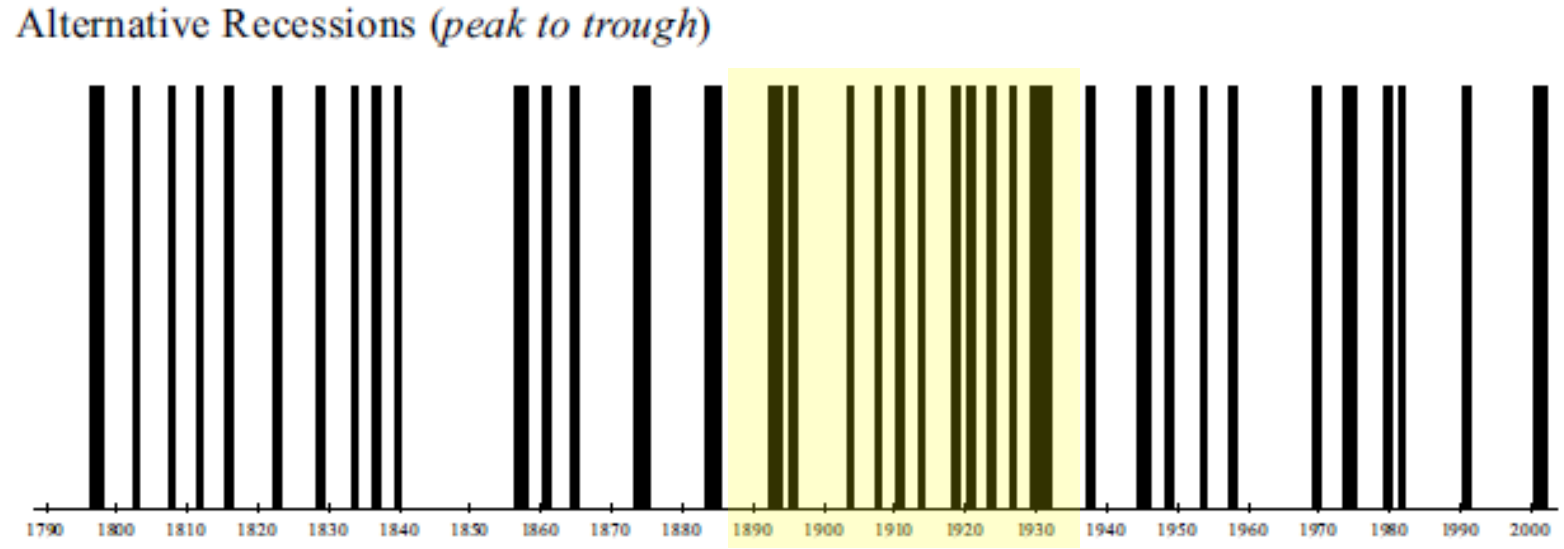


FIGURE 3

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

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

III. Margaret McConnell and Gabriel Perez-Quiros, "Output Fluctuations in the United States: What Has Changed Since the Early 1980's?"

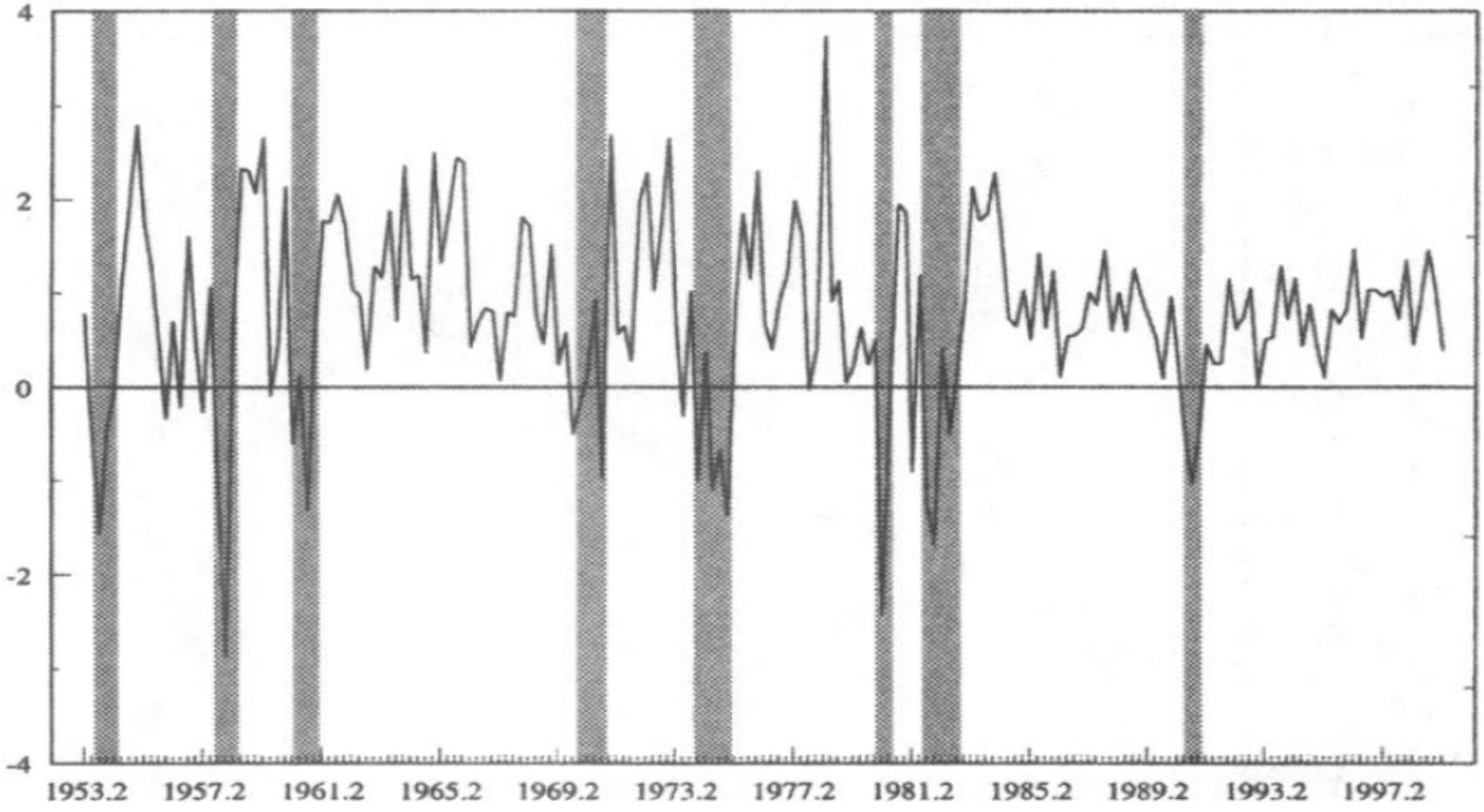


FIGURE 1. U.S. REAL GDP GROWTH: 1953:2 TO 1999:2

From McConnell and Perez-Quiros, "Output Fluctuations in the United States"

Table 2

Standard Deviation of Percentage Changes

Series	*1948–1984*	*1985–1997*
Industrial Production	5.7%	2.2%
GNP	2.8	1.3
Commodity Output	5.3	3.6
Unemployment Rate	1.2	0.6

Notes: The standard deviation for the unemployment rate is for simple changes and so is expressed in percentage points rather than percent. The later sample period for commodity output ends in 1996.

From Christina Romer, ”Changes in Business Cycles”

Table 1
Changes in Volatility of Four-Quarter Growth of Real GDP per Capita in the G7, 1960 – 1983 and 1984 – 2002.

	Standard deviation, 1960 – 1983	Standard deviation, 1984 – 2002	std. dev. 84-02 / std. dev. 60-83	variance 84-02 / variance 60-83
Canada	2.3	2.2	.96	.91
France	1.8	1.4	.71	.51
Germany	2.5	1.5	.60	.36
Italy	3.0	1.3	.43	.19
Japan	3.7	2.2	.59	.35
UK	2.4	1.7	.71	.50
US	2.7	1.7	.63	.40

Notes: Entries in the first two columns are the standard deviations of the four-quarter growth in GDP over the indicated time periods. The third column contains the ratio of standard deviation in the second column to that in the first; the final column presents the square of this ratio, which is the ratio of the variances of four-quarter GDP growth in the two periods. Data sources are given in the Data Appendix

From James Stock and Mark Watson, “Has the Business Cycle Changed?”

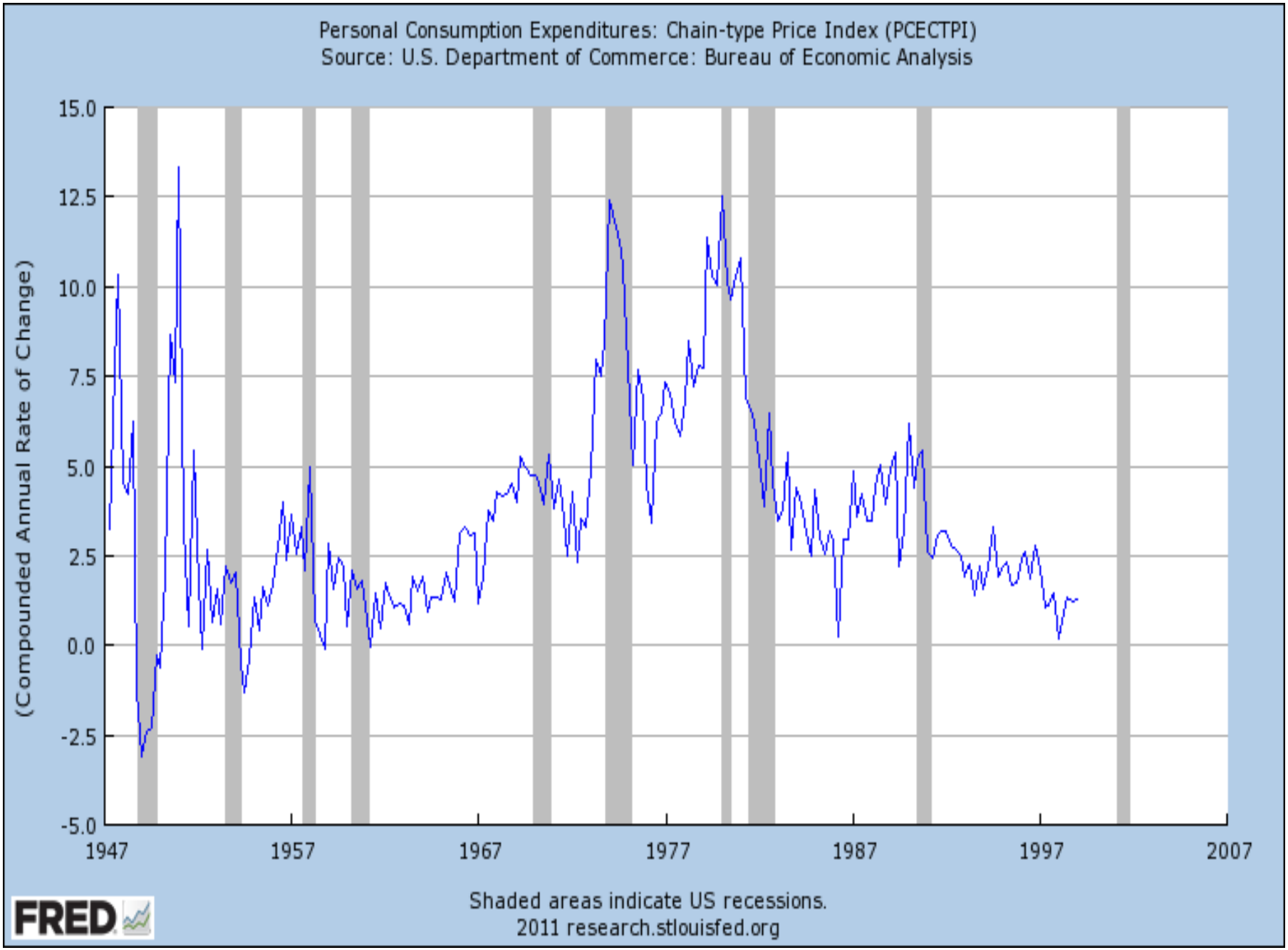

Personal Consumption Expenditures: Chain-type Price Index (PCECTPI)
Source: U.S. Department of Commerce: Bureau of Economic Analysis
(Compounded Annual Rate of Change)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
-2.5
-5.0
1947
1957
1967
1977
1987
1997
2007
FRED
Shaded areas indicate US recessions.
2011 research.stlouisfed.org

TABLE 2—STRUCTURAL BREAK TESTS:
U.S. REAL GDP GROWTH—1953:2 TO 1999:2

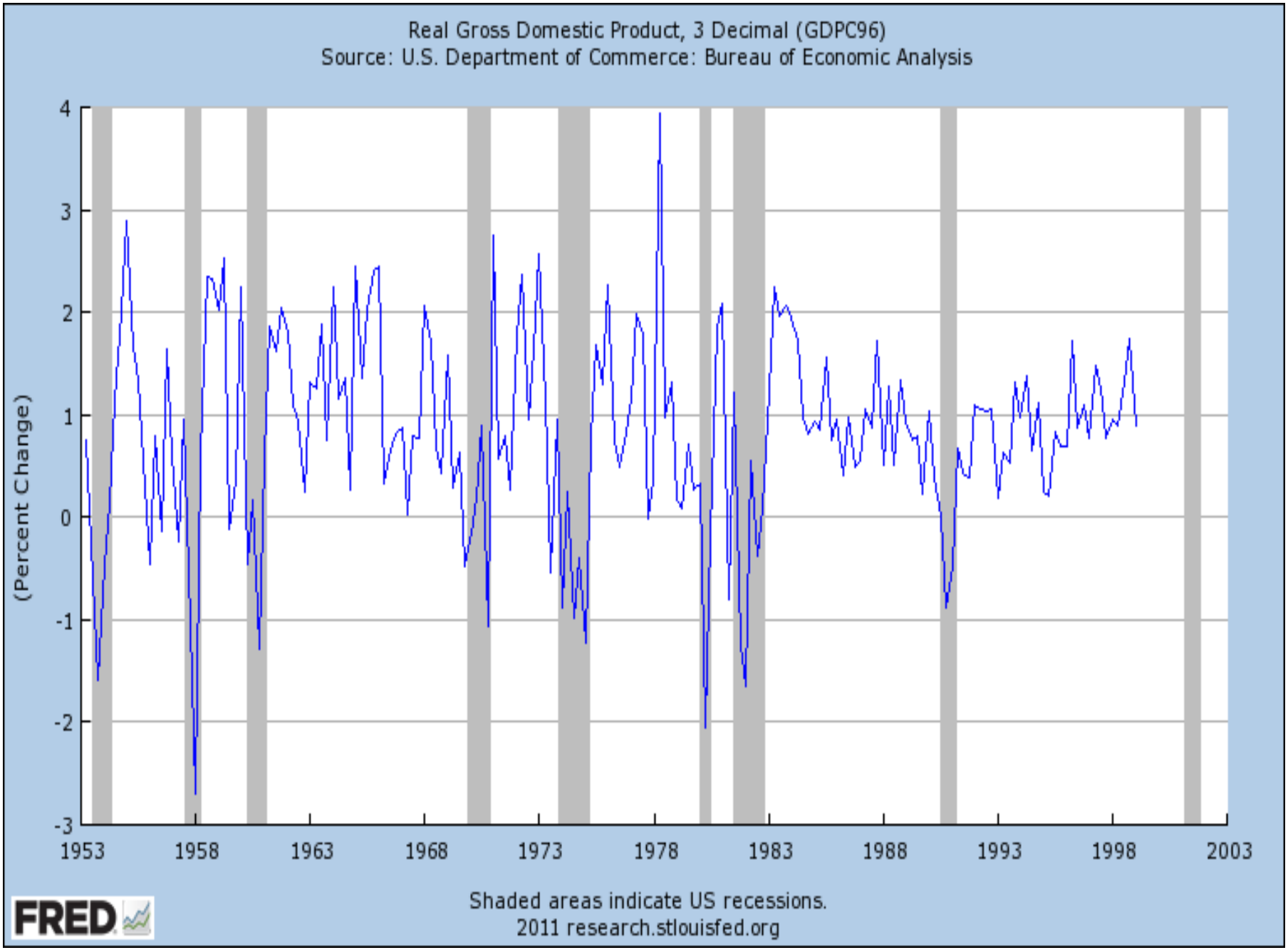
A.

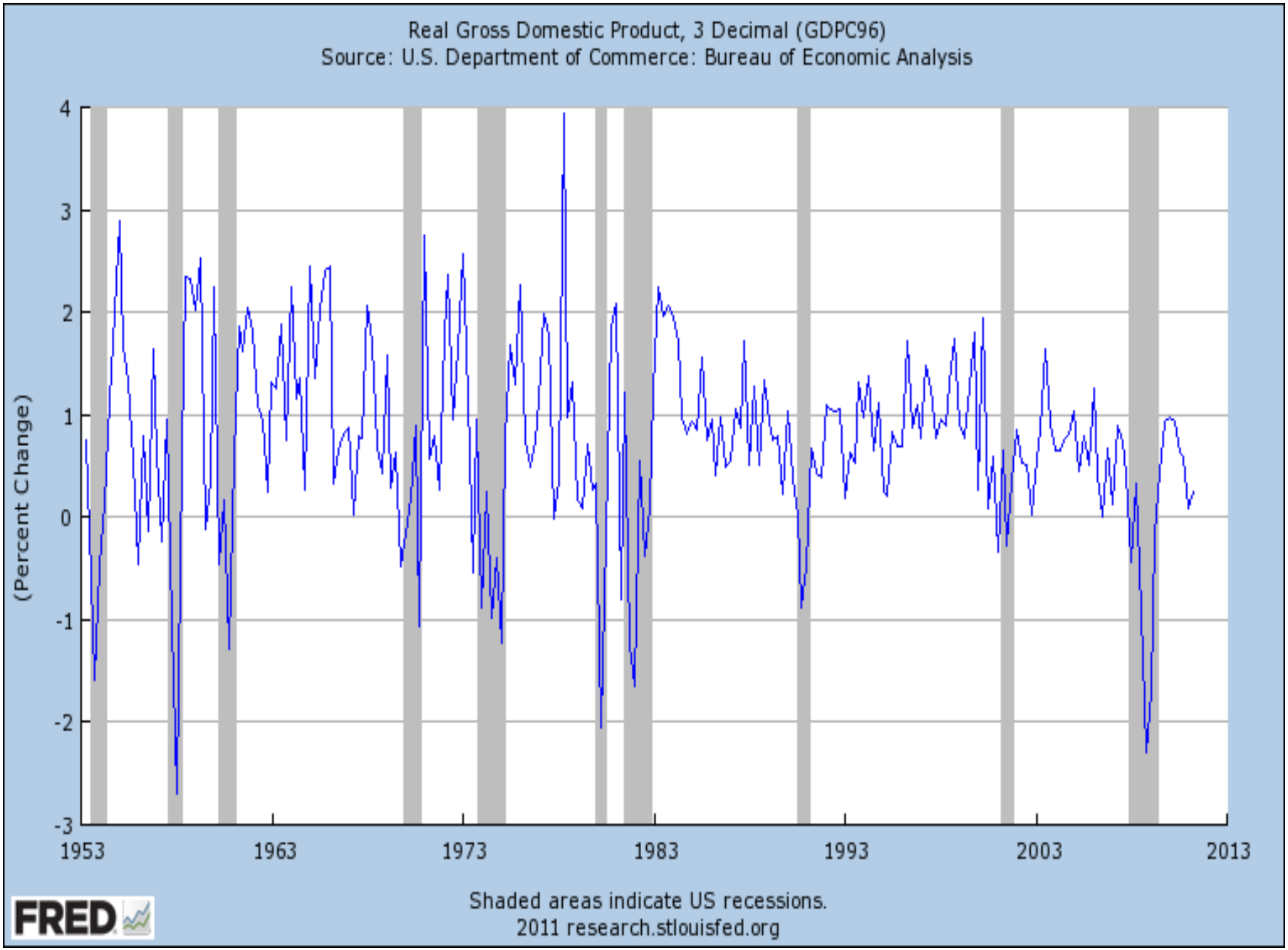
Specification: $\Delta y_t = \mu + \phi \Delta y_{t-1} + \varepsilon_t$, $\varepsilon_t \sim N(0, \sigma_t^2)$
where $\sigma_t^2 = \sigma_1^2$ if $t \leq T$, and $\sigma_t^2 = \sigma_2^2$ if $t > T$

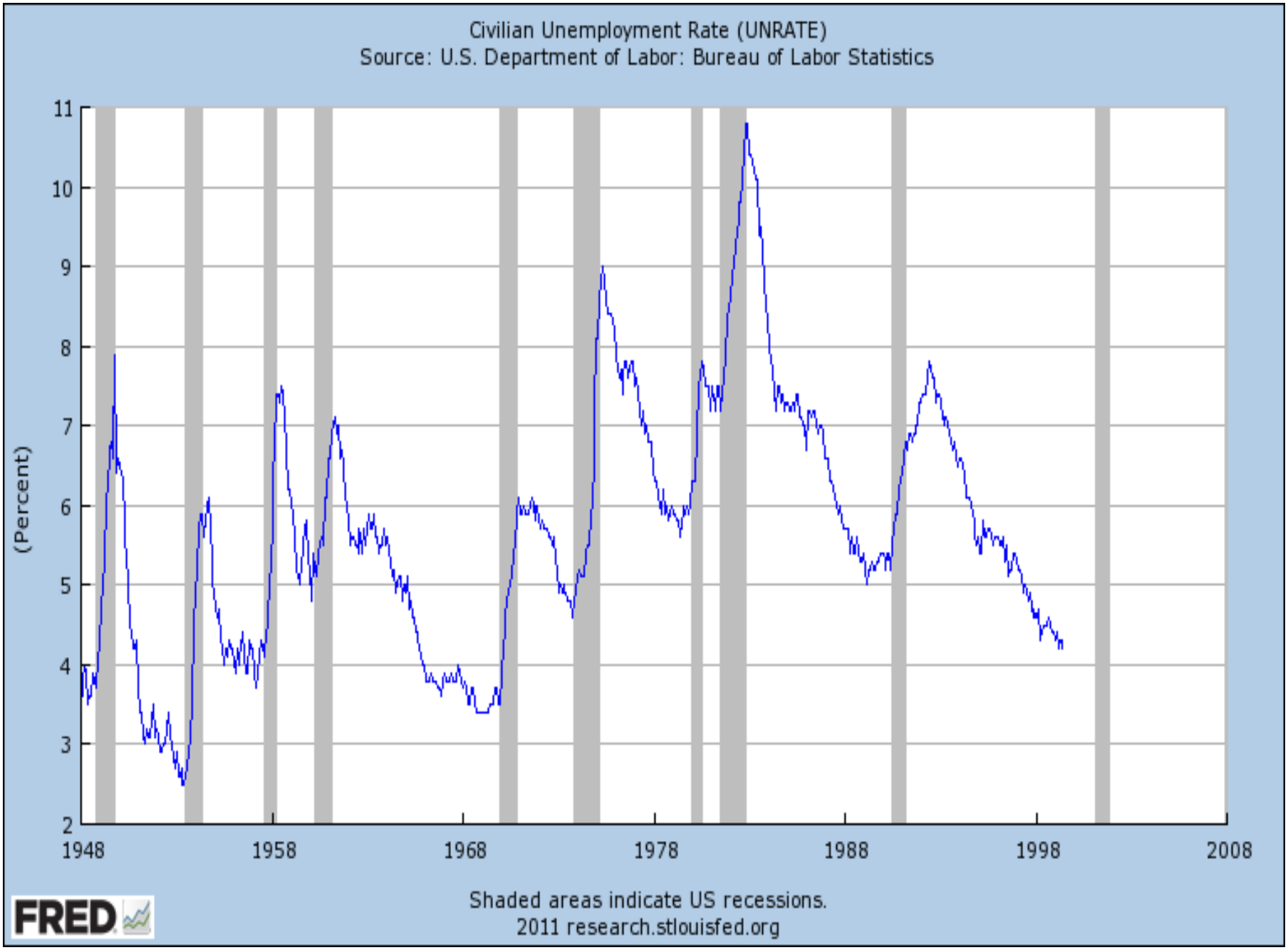
Null	Sup	Exp	Ave
$\sigma_1^2 = \sigma_2^2$	17.80	6.54	6.71
	(0.00)	(0.00)	(0.00)

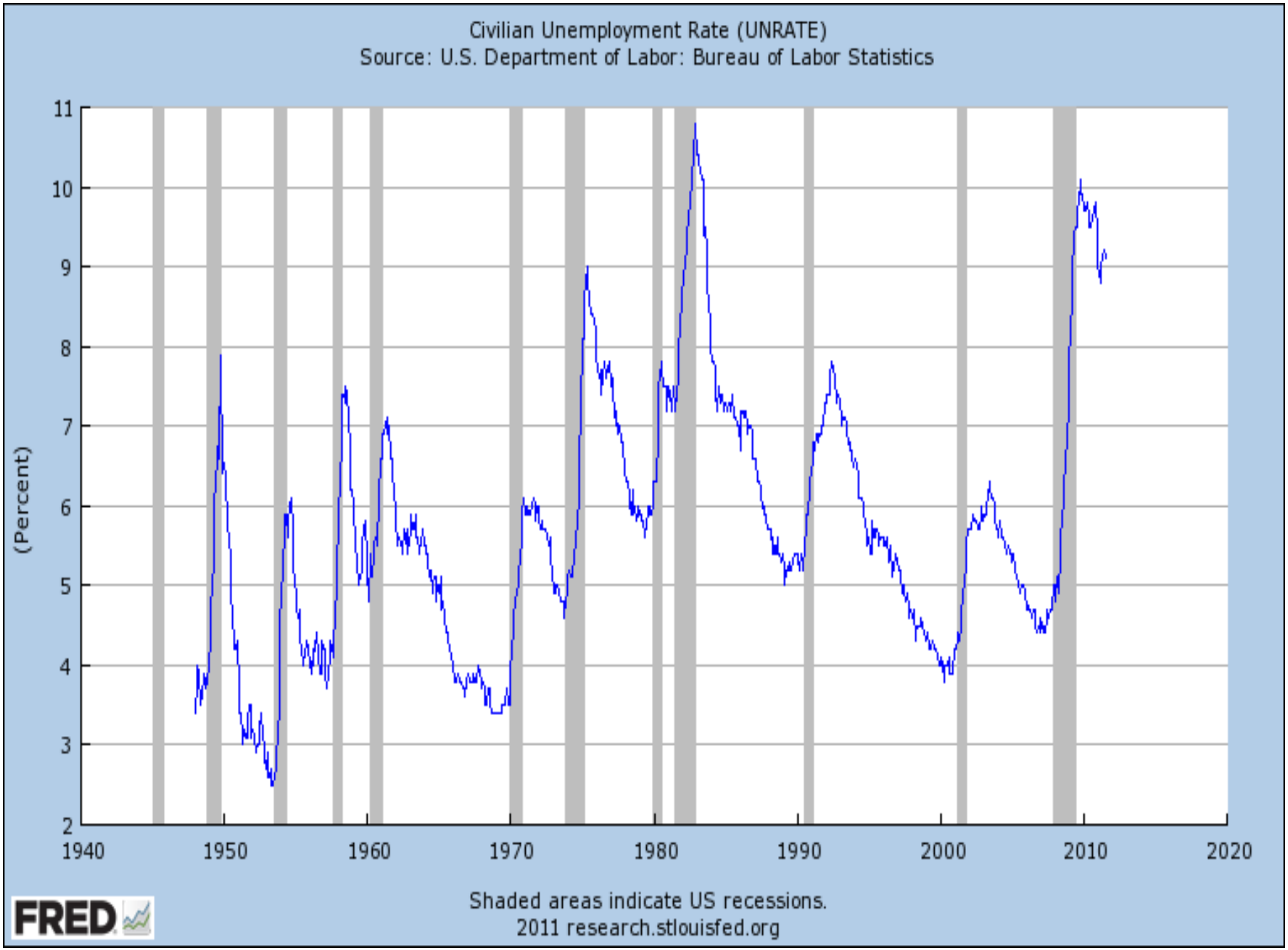
Estimated break date: 1984:1

From McConnell and Perez-Quiros, "Output Fluctuations in the United States"


Real Gross Domestic Product, 3 Decimal (GDPC96)
Source: U.S. Department of Commerce: Bureau of Economic Analysis
(Percent Change)
4
3
2
1
0
-1
-2
-3
1953
1958
1963
1968
1973
1978
1983
1988
1993
1998
2003
FRED
Shaded areas indicate US recessions.
2011 research.stlouisfed.org


Real Gross Domestic Product, 3 Decimal (GDPC96)
Source: U.S. Department of Commerce: Bureau of Economic Analysis
(Percent Change)
4
3
2
1
0
-1
-2
-3
1953
1963
1973
1983
1993
2003
2013
Shaded areas indicate US recessions.
2011 research.stlouisfed.org
FRED


Civilian Unemployment Rate (UNRATE)
Source: U.S. Department of Labor: Bureau of Labor Statistics
(Percent)
11
10
9
8
7
6
5
4
3
2
1948
1958
1968
1978
1988
1998
2008
Shaded areas indicate US recessions.
2011 research.stlouisfed.org
FRED


Civilian Unemployment Rate (UNRATE)
Source: U.S. Department of Labor: Bureau of Labor Statistics
(Percent)
11
10
9
8
7
6
5
4
3
2
1940
1950
1960
1970
1980
1990
2000
2010
2020
FRED
Shaded areas indicate US recessions.
2011 research.stlouisfed.org

Has the Great Moderation Ended?

	1953:Q2-1983:Q4	1984:Q1-1999:Q2	1984:Q1-2011:Q2
S.d. of quarterly GDP growth (percentage points)	1.14	0.53	0.65
S.d. of unemployment rate (percentage points)	1.70	1.00	1.46

IV. Christopher Hanes, "The Development of Nominal Wage Rigidity in the Late 19th Century"

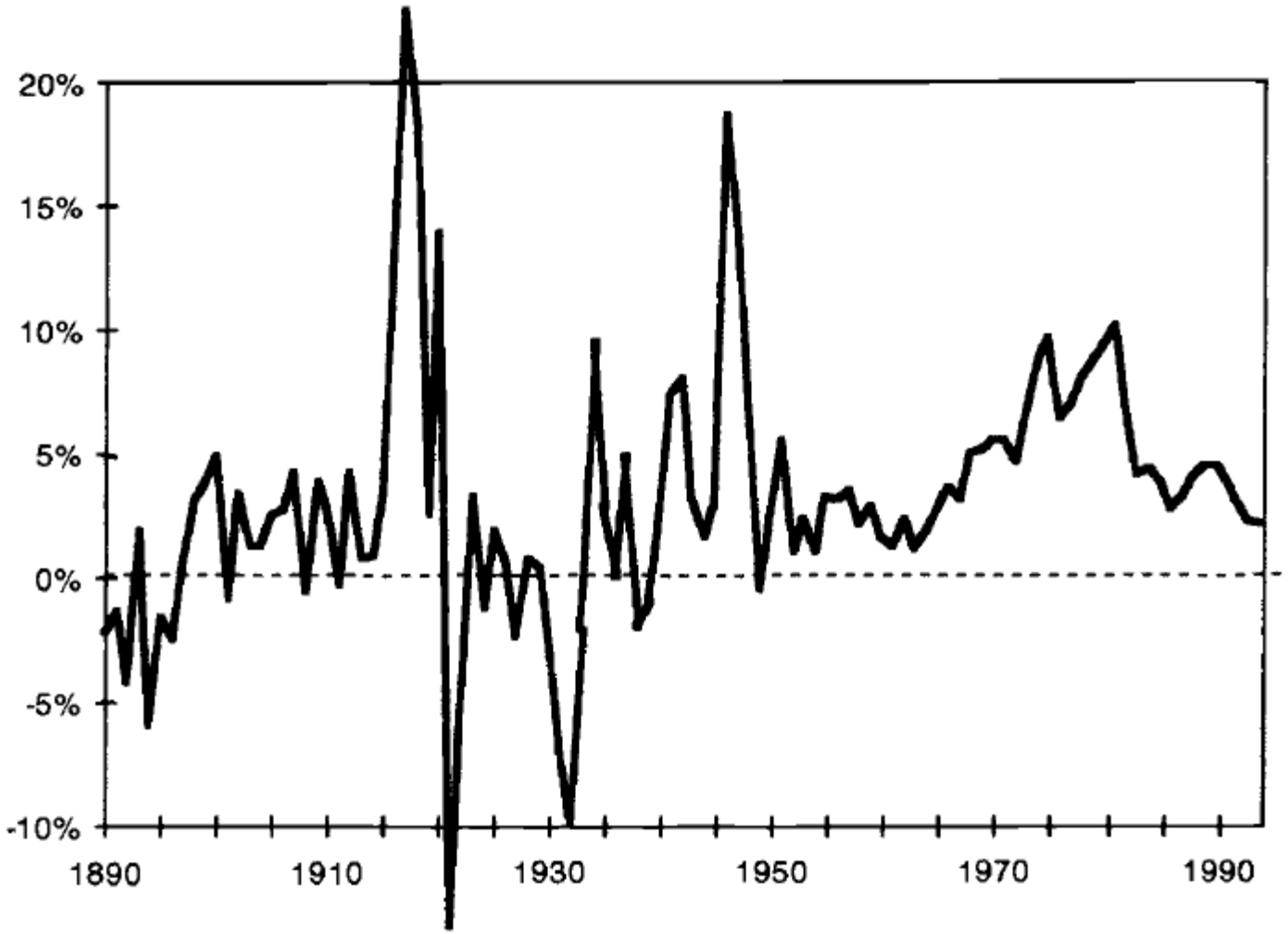
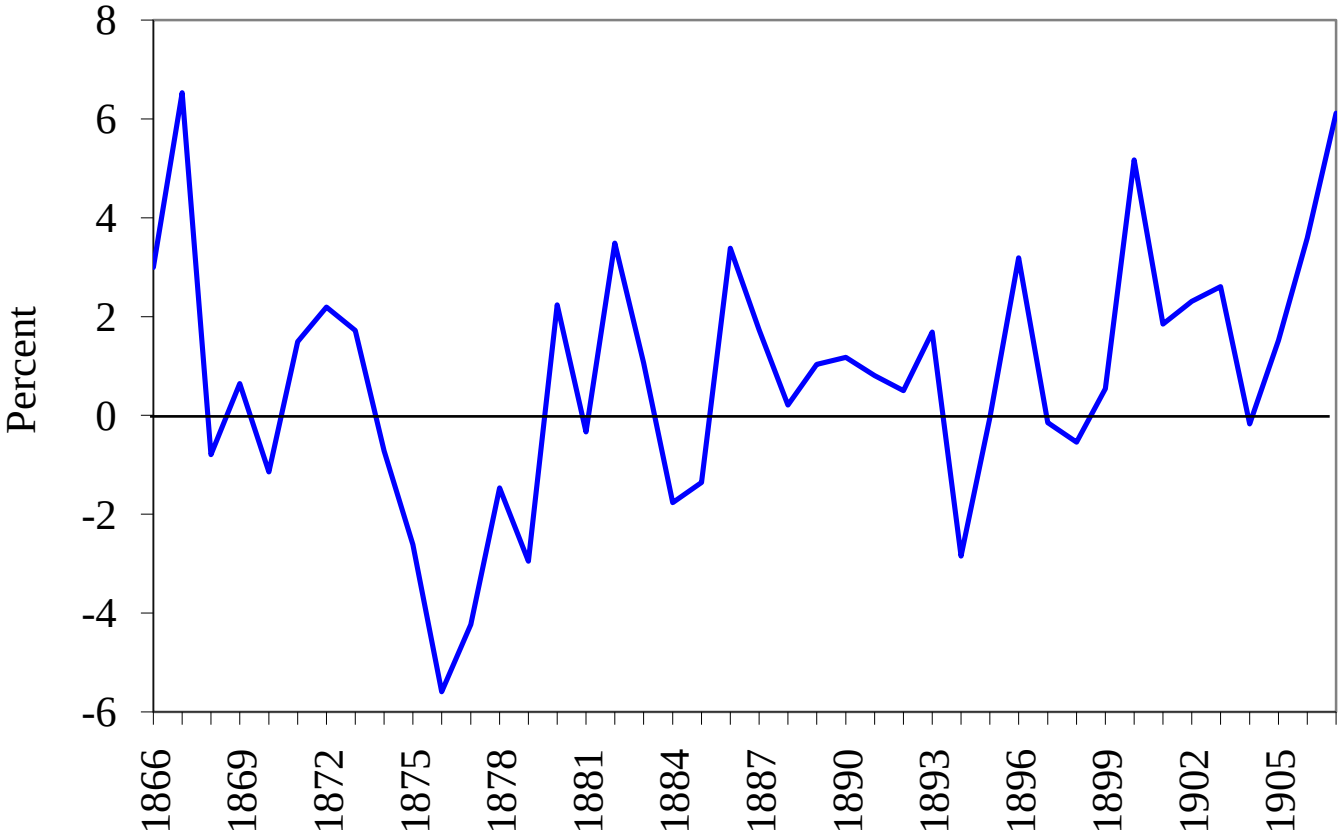


Fig. 6.1 Annual inflation (GDP deflator), 1890–1995

From J. Bradford DeLong, "America's Peacetime Inflation," in Romer and Romer, eds., *Reducing Inflation: Motivation and Strategy* (1997)

Hanes's Wage Inflation Series



Specification:

$$w_t - w_{t-1} = (\alpha + \alpha_{1889-1907}) + (\beta + \beta_{1889-1907})(y - \hat{y})_t + (\gamma + \gamma_{1889-1907}) \sum_{t-1-i}^{t-1} (c + c_{1889-1907})_i (p_{t-1-i} - p_{t-2-i})$$

A. *Comparable Wage and Price Series:*

	Frickey output index			
	$i = 1$		$i = 5$	
Variable	(i)	(ii)	(iii)	(iv)
Constant:				
α	−0.007	−0.004	−0.006	0.001
	(−1.530)	(−0.733)	(−0.799)	(0.139)
$\alpha_{1889-1907}$	0.021	0.018	0.020	0.013
	(3.584)	(2.690)	(2.447)	(1.401)
Output deviation from trend 1870–1907:				
β	0.286		0.281	
	(5.320)		(4.752)	
$\beta_{1889-1907}$	−0.227		−0.227	
	(−3.180)		(−2.730)	
Output deviation from trend $t-4$ to $t+4$:				
β		0.309		0.328
		(4.071)		(3.664)
$\beta_{1889-1907}$		−0.251		−0.280
		(−2.366)		(−2.253)
Lagged prices:				
γ	−0.094	−0.100	−0.059	0.022
	(−1.278)	(−1.131)	[0.268]	[0.525]
$\gamma_{1889-1907}$	0.253	0.272	0.295	0.258
	(2.276)	(2.114)	[1.519]	[1.310]

Specification:

$$w_t - w_{t-1} = (\alpha + \alpha_{1889-1991} + \alpha_{1977-1991}) + (\beta + \beta_{1889-1991} + \beta_{1977-1991})(y - \hat{y})_t + (\gamma + \gamma_{1889-1991} + \gamma_{1977-1991}) \sum_{t-1-i}^{t-1} (c + c_{1889-1991} + c_{1977-1991})_i \times (p_{t-1-i} - p_{t-2-i})$$

	$i = 1$		$i = 5$	
Variable	(i)	(ii)	(iii)	(iv)
Constant:				
α	−0.007 (−1.651)	−0.004 (−0.804)	−0.006 (−0.908)	0.001 (0.159)
$\alpha_{1889-1991}$	0.021 (3.867)	0.018 (2.952)	0.020 (2.786)	0.013 (1.605)
$\alpha_{1977-1991}$	0.020 (2.928)	0.021 (2.710)	0.009 (1.056)	0.010 (1.083)
Output deviation from trend 1870–1907 and 1977–1991:				
β	0.286 (5.741)		0.281 (5.409)	
$\beta_{1889-1991}$	−0.227 (−3.431)		−0.227 (−3.108)	
$\beta_{1977-1991}$	−0.038 (−0.388)		0.061 (0.531)	
Output deviation from trend $t-4$ to $t+4$:				
β		0.309 (4.467)		0.328 (4.198)
$\beta_{1889-1991}$		−0.251 (−2.596)		−0.280 (−2.581)
$\beta_{1977-1991}$		−0.021 (−0.173)		0.099 (0.642)
Lagged prices:				
γ	−0.094 (−1.378)	−0.100 (−1.241)	−0.059 [3.235]	0.022 [3.499]
$\gamma_{1889-1991}$	0.253 (2.456)	0.272 (2.320)	0.295 [2.835]	0.258 [3.816]
$\gamma_{1977-1991}$	0.303 (2.355)	0.290 (2.055)	0.335 [1.544]	0.365 [1.154]

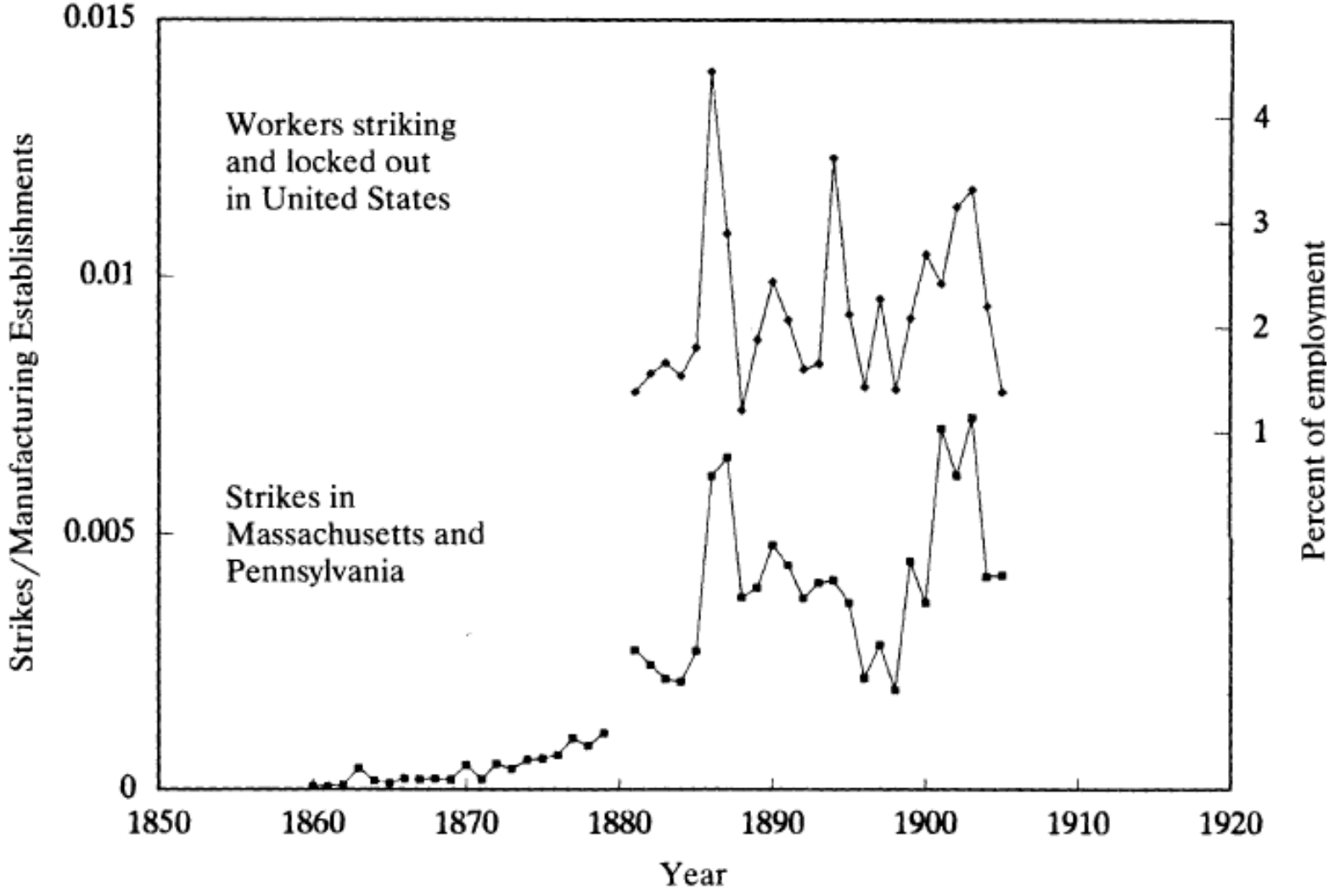


FIGURE 1. STRIKES, 1860–1905

From Hanes, "The Development of Nominal Wage Rigidity in the Late 19th Century"

TABLE 7—PROBIT ESTIMATION: WAGE CUTS 1893–1894 AND STRIKES

A. *Strike Rates 1881–1886:*

(i) *Firm-Wide Wage Cuts: Connecticut, Maine, and Ohio*
($n = 1{,}019$; 246 firms cut wages)

Statistic	Constant	Maine	Ohio	Strikers
Coefficient	−0.161	0.196	−0.920	−0.923
t	−1.633	1.648	−8.654	−3.294

Log likelihood: −490.256

B. *Strike Rates 1887–1894:*

(i) *Firm-Wide Wage Cuts: Connecticut, Maine, and Ohio*
($n = 1{,}067$; 256 firms cut wages)

Statistic	Constant	Maine	Ohio	Strikers
Coefficient	−0.348	0.236	−0.935	−0.211
t	−3.834	2.077	−9.092	−0.787

Log likelihood: −521.773

From Hanes, "The Development of Nominal Wage Rigidity in the Late 19th Century"