

THE GREAT WAR

World War 1 : ECONOMY

OUTLINE

- **1. British Blockade of Germany**
- **2. Impact on U.S. Economy**
- **3. Peace Treaty Sows Seeds for World War II**

UNTIL IT'S OVER, OVER THERE: THE U.S. ECONOMY IN WORLD WAR I

- NBER WORKING PAPER SERIES

- **Hugh Rockoff**

- NATIONAL BUREAU OF ECONOMIC RESEARCH 1050
Massachusetts Avenue

- Cambridge, MA 02138

- June 2004

A Chronology of The U.S. Economy in World War I

1914	
August	Beginning of World War I.
December	Trough of U.S. Business Cycle.
1915	
May	A German submarine sinks the Lusitania; 124 Americans are killed and public opinion shifts away from neutrality.
1916	
June	The National Defense Act provides for expansion of the Army.
August	Council of National Defense established to plan and coordinate defense efforts.
September	U.S. Shipping Board created to build, lease, and requisition ships.
November	Woodrow Wilson is elected President.
1917	
April	The United States enters World War I.
June	First Liberty Loan.
July	The War Industries Board succeeds the General Munitions Board, and is given the task of increasing production and coordinating the mobilization.
August	The Lever Food and Fuel Control Act empowers the President to fix the price and regulate the distribution of food and fuel. Herbert Hoover is appointed Food Administrator and Harry Garfield, Fuel Administrator. The Act also prohibits the importation of distilled liquors or their manufacture from foodstuffs.
October	The War Revenue Act authorizes a graduated income tax, corporate profits tax, and sharp increases in postal rates and excise taxes.
November	Second Liberty Loan
December	The railroads are placed under Federal administration. Williams Gibbs McAdoo is in charge.
"	The Prohibition Amendment to the Constitution (the eighteenth amendment) prohibiting the manufacture, sale, or transportation of drinkable alcohol.
1918	
January	An official schedule of maximum prices for steel is established.
March	The War Industries Board is reorganized and Bernard M. Baruch is placed in charge.

CHRONOLOGY

United States Economy

World War 1

April	The War Finance Corporation is created to make loans to financial institutions that had extended credits to war industries.
"	National War Labor Board is created to act as a court of last resort in labor disputes.
May	Third Liberty Loan
June	New system for allocating steel is introduced concentrating authority in the hands of the War Industries Board.
"	The National War Labor Board is established to standardize labor conditions. Felix Frankfurter is placed in charge.
August	Peak of U.S. Business Cycle
October	Fourth Liberty Loan
November	Armistice
1919	
January	The Prohibition Amendment is declared ratified. It will become effective in January 1920. It will be repealed in 1933.
February	The War Revenue Act of 1918 takes effect.
April	Victory Loan
October	The Volstead Act, which provides a mechanism for enforcing prohibition, is adopted.
December	President Wilson announces that the railroads will be returned to private ownership in March 1920.

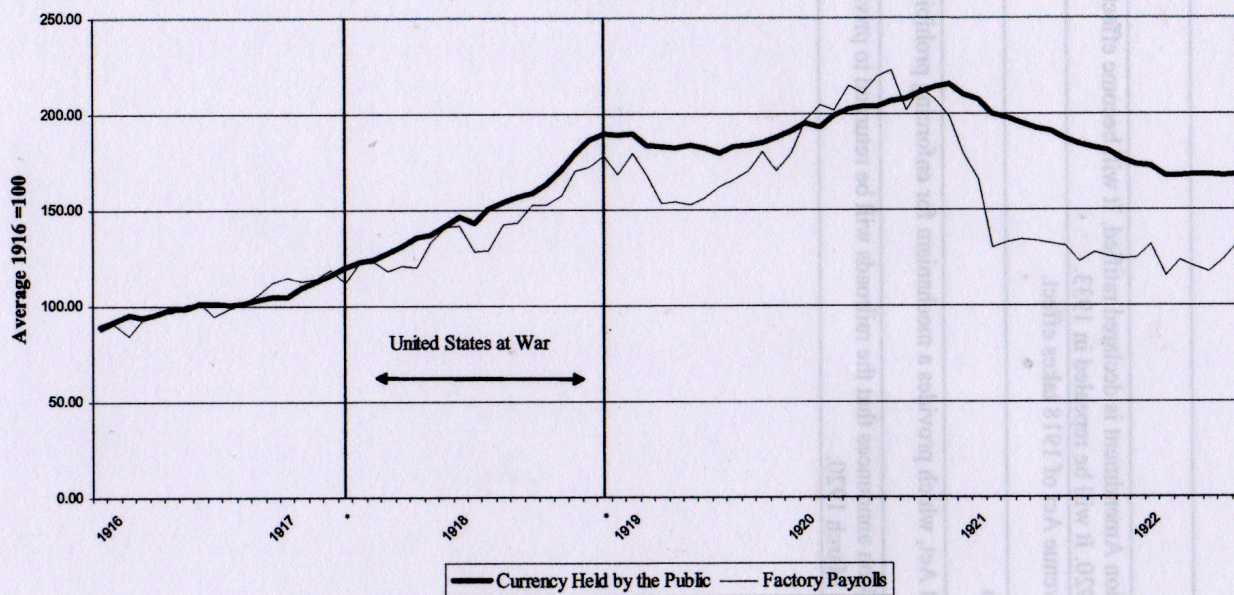
CHRONOLOGY (CONTINUED)

United States
Economy

World War 1

CURRENCY & PAYROLLS

Figure 1
Currency and Payrolls



LABOR FORCE BY SECTOR

Table 2. The Labor Force by Sector, 1914-1920

A. Persons engaged (thousands)

	Total	Public Sector		Private Sector	
		Military	Civilian	Farm	Nonfarm
1914	37,475	161	1,527	10,456	25,331
1915	37,669	169	1,584	10,466	25,450
1916	40,126	174	1,620	10,497	27,835
1917	41,531	835	1,692	10,447	28,557
1918	43,998	2,968	2,092	10,311	28,627
1919	42,313	1,266	2,057	10,197	28,793
1920	41,497	353	1,961	10,343	28,840
change 1914-16	2,651	13	93	41	2,504
change 1916-18	3,872	2,794	472	-186	792
change 1914-18	6,523	2,807	565	-145	3,296
Percent Change 1914-					
1918	16.05	291.42	31.48	-1.40	12.23

B. Annual Hours per Person Engaged

1914	2,688	2,043	2,034	2,496	2,811
1915	2,654	2,036	2,027	2,443	2,784
1916	2,668	2,034	2,033	2,421	2,802
1917	2,665	2,032	2,014	2,501	2,782
1918	2,611	2,009	1,984	2,568	2,735
1919	2,551	2,009	1,931	2,549	2,619
1920	2,584	2,003	1,932	2,552	2,647
change 1914-16	-20	-9	-1	-75	-9
change 1916-18	-57	-25	-49	147	-68
change 1914-18	-77	-34	-50	72	-77
Percent Change 1914-					
1918	-3.98	-1.33	-4.84	4.25	-6.10

Source: Kendrick (1961, Table A-VI, p. 306; Table A-X, p. 312).

FINANCING WORLD WAR 1

March 1917 -
March 1919

Table 3. Financing World War I, March 1917-May 1919

Source of Finance	Billions of Dollars	Percent
Taxation and Nontax receipts	7.3	22
Borrowing from the Public	24	58
Direct Money Creation	1.6	5
Indirect Money Creation	4.8	15
Total Cost of the War	33	100

Note: Direct and indirect money creation is defined in the text. The estimate of indirect money creation is based on the assumption that the total increase in deposits and circulation (notes) of commercial banks were backed directly or indirectly by government securities. This is partly conjectural because some of the items that appeared on bank balance sheets such as "loans to customers" may or may not have been secured by government bonds. The amount shown may be regarded as an upper bound. The figure is based on the increase in M2, which includes time and demand deposits of commercial banks but excludes deposits in mutual savings banks. If the latter are included (they are included in M3) the maximum percentage financed by money creation rises to 21 percent. Including savings and loan shares, the distinguishing feature of M4, would change the results only slightly, and would add a more problematic element because it is doubtful that the increase in savings and loan shares were matched completely, directly or indirectly by government bond holdings.

Source: Friedman and Schwartz (1963, p. 221)

CHANGES FEDERAL INCOME TAX RATES

1913 - 1929

Table 5. Changes in Federal Individual Income Tax Rates, 1913-1929

Years	Income Class		
	\$50,000	\$100,000	\$1,000,000
1913-1915	1.5%	2.5%	6.0%
1916	2.6	3.9	10.3
1917	10.3	16.2	47.5
1918	22.0	35.0	70.3
1919-1920	18.3	31.2	66.3
1929	8.3	14.8	23.1

Note: These are the effective tax rates (percent of income) with 4 exemptions. Income subject to tax excludes certain expenses and interest on tax-exempt bonds.

Source: U.S. Bureau of the Census (1975, series Y437, Y438, and Y439, p. 1112)

Table 7. U.S. Production of Selected Munitions in World War I

Munition	Total Production to the end of the war ^a	Peak monthly rate of production ^b	Production in the Peak Month at an Annual Rate
Rifles	3,550,000	271,000	3,252,000
Machine Guns	226,557	35,000	420,000
Artillery Units	3,077	410	4,920
Smokeless Powder (pounds)	632,504,000	n.a.	n.a.
High Explosives (pounds)	375,566,000	n.a.	n.a.
Rounds of Artillery Ammunition	20,326,000	3,072,000	31,104,000
Toxic Gas (tons)	10,817	2,726	32,712
Tanks	799	n.a.	n.a.
Training Planes	9,503	n.a.	n.a.
Training Engines	17,073	n.a.	n.a.
De Havilland-4 Bombers (shipped)	3,227 (1,885)	1,100	13,200
Liberty Airplane Engines (shipped)	13,574 (4,435)	3,850	46,200

^aTypically, this is the period from April 1917 to March or April 1919. Production after the armistice was usually limited, reflecting the completion of units in the pipeline.

^bGenerally, October 1919.

Source: Ayres (1919, *passim*)

U.S. PRODUCTION OF SELECTED MUNITIONS

World War 1

COSTS OF WORLD WAR 1

Table 8. The Costs of World War I

A. Cost of World War I in Comparative Perspective

	Total Cost (Billions of Current Dollars)	Total Cost (Billions of 1982 Dollars)	As a Percentage of GNP
WWI (1917-1918)	32.4	77.9	52.2
WWII (1941-1945)	306.7	1,459.7	175.4
Korea (1950-1953)	49.9	106.3	14.8
Vietnam (1964-1973)	108.3-136.3	13.2-392.5	10.6-13.3

B. Cost of World War I by Year

Year	Billions of Dollars	As a Percentage of GDP
1917	6	10.9 (9.7) [5.0]
1918	16	23.0 (21.1) [17.4]
1919	9	11.7 (11.5) [9.7]
1920	1	1.1 (1.1) [2.4]
Total	32	46.6 (43.4) [34.5]

Sources and Notes: A. Costs: Edelstein (2000, p. 342). For Vietnam the larger amount is the total spent on the military, the smaller amount excludes the normal peacetime costs of maintaining the armed forces. GDP was the average of GDP in the first year of the war and the last year from Johnston and Williamson (2002). (B) Expenditures: Clark (1970 [1931], 121). GNP: Balke and Gordon (1989) and Romer (1989). The calculation using Balke and Gordon's estimates of GNP are shown first, mainly because Robert Gordon was on my dissertation committee, and the calculation using Romer's estimates follow in parentheses. The third estimate, in brackets, is from Kendrick (1961, table A1, columns 5 and 6, p. 291). These estimates are somewhat lower during the war years primarily because the loans to the Allies are excluded.

QUESTIONS