12. World War II

Econ 373: US Economic History

Taylor Jaworski

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The **traditional story** of wartime mobilization

- Americans tend to romanticize the international and domestic history associated with World War II, the 1940s, and the decades that came after:

- The country was attacked at Pearl Harbor, and across the Pacific and Atlantic went on to make the world safe for democracy (and capitalism)

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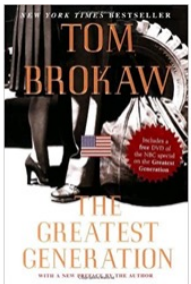

August 15, 2011, 10:58 am | 137 Comments

Oh! What A Lovely War!

World War II is the great natural experiment in the effects of large increases in government spending, and as such has always served as an important positive example for those of us who favor an activist approach to a depressed economy. Christy Romer is very much on the same wavelength.

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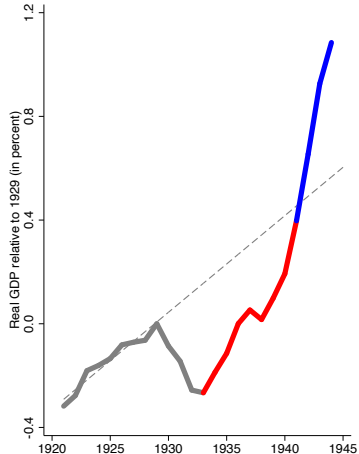
- The war-related production boom aided recovery from the Great Depression, spurred productivity gains, and helped to develop the American South

- The war created new opportunities and helped transform the role of American women at work, at home, and in the economy over the postwar period

- In this part of **lecture** we examine these claims, and end by quantifying the war's cost

The wartime **production boom**

- The United States began WWII below its 1921-29 trend and ended above trend
- This led historians and economists to declare this period one of "war prosperity"
- In part, this is due to the emphasis placed on standard macroeconomic indicators
- But standard indicators do not measure aggregate well-being in war (or ever!)



The wartime **production boom**

- Standard indicators are also subject to reinterpretation, e.g., by Robert Higgs
  - employment and unemployment (include defense, etc employment?)
  - real gross national product (include military spending?)

Fiscal Year	Nondefense Employment	Defense Employment	Civilian Unemployment (BLS concept)	Labor Force Residuum
1940	82.4	1.8	15.7	17.6
1941	79.4	8.5	12.0	20.6
1942	67.3	25.7	7.0	32.7
1943	57.6	39.4	3.0	42.4
1944	58.4	40.3	1.3	41.6
1945	59.5	39.2	1.3	40.5
1946	88.5	8.9	2.6	11.5
1947	90.9	5.3	3.8	9.1
1948	90.9	5.3	3.9	9.1
1949	88.4	5.2	6.4	11.6

	Commerce			Kuznets			
Year	Estimate of 1975	Estimate of 1990	Kendrick	Wartime	Revised	Variant III	GNP*
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	108.5	107.9	109.7	109.3	109.0	109.0	108.7
1941	125.9	126.9	128.7	125.9	121.8	121.7	119.4
1942	142.2	150.8	145.5	131.9	126.5	118.2	108.4
1943	161.0	178.1	160.6	148.6	132.5	117.6	102.2
1944	172.5	192.7	172.4		135.8	122.1	105.4
1945	169.6	189.1	171.3		139.4	125.6	114.3
1946	149.3	153.1	156.7		151.0	146.5	144.8
1947	148.0	148.9	153.4		154.5	148.0	147.3
1948	154.6	154.7	160.0		155.5	153.1	152.3
1949	154.8	154.8	156.9		152.6	148.5	147.5

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  - ▷ employment and unemployment (include defense, etc employment?)
  - ▷ real gross national product (include military spending?)
  - real consumption per capita (adjust for inflation?)
  - stock prices and corporate profits (expectations about the future?)

Year	Personal Consumption Per Capita (current dollars)	Friedman and Schwartz's Deflator	Real Personal Consumption Per Capita
1939	100.0	100.0	100.0
1940	105.3	101.1	104.2
1941	118.6	109.1	108.7
1942	128.6	123.4	104.2
1943	142.3	139.6	101.9
1944	153.0	150.0	102.0
1945	167.3	156.6	106.8
1946	199.2	158.0	126.1
1947	219.8	170.8	128.7
1948	233.5	182.0	128.3
1949	233.9	179.6	130.2

Year	Standard & Poor's Index of Common Stock Prices (1941–1943 = 10)	Market Value of Stocks on Registered Exchanges (billions of current dollars)	Corporate Profits[a] (billions of current dollars)
1939	12.06	11.426	4.0
1940	11.02	8.404	5.9
1941	9.82	6.240	6.7
1942	8.67	4.309	8.3
1943	11.50	9.024	9.9
1944	12.47	9.799	11.2
1945	15.16	16.226	9.0
1946	17.08	18.814	8.0
1947	15.17	11.587	11.7
1948	15.53	12.904	17.8
1949	15.23	10.740	17.8

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- Alternatively, we can view the wartime production boom through its effect on personal income and employment: $\Delta GNP = multiplier \times (\Delta C + \Delta I + \Delta(X - M) + \Delta G)$
- The multiplier associated with war-related government spending was 0.3, i.e., \$1 in government spending increased GDP by \$0.3, compared with other estimates

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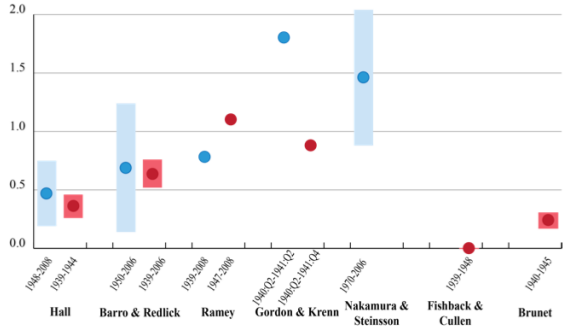

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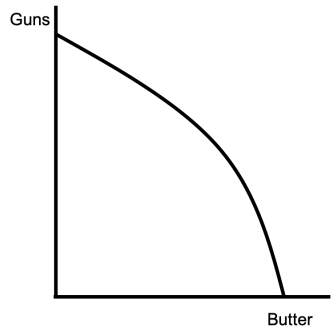

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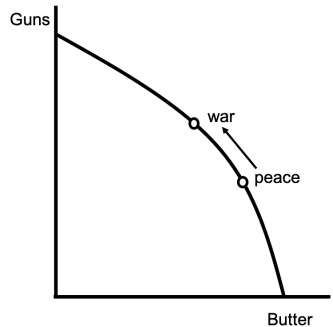

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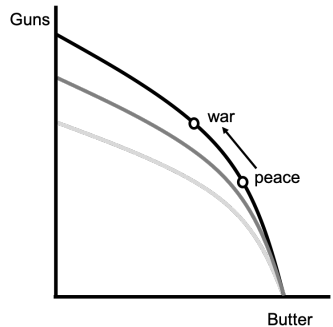

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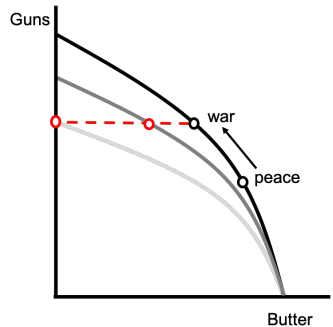

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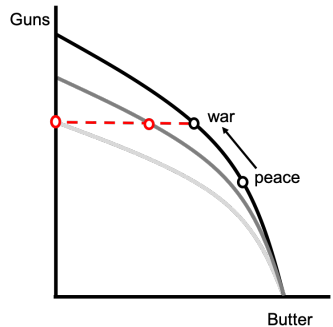
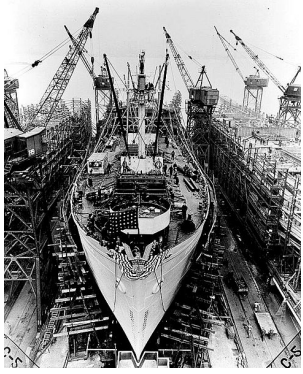
- Increases in output went to taxes (for the present) and savings (for the future)



The wartime **production boom**

- As case studies for the impact of the wartime production boom, we can examine Liberty shipbuilding and the postwar industrialization of the American South

Liberty Shipbuilding



Bell Aircraft in Georgia

Liberty **shipbuilding**

- The United States embarked on an massive expansion of its merchant marine fleet in 1941: the Liberty ship was centerpiece of the program
- Over a four-year period, sixteen US shipyards delivered a total of 2,699 ships
- A novel aspect was that a substantial portion of construction took place off the ways
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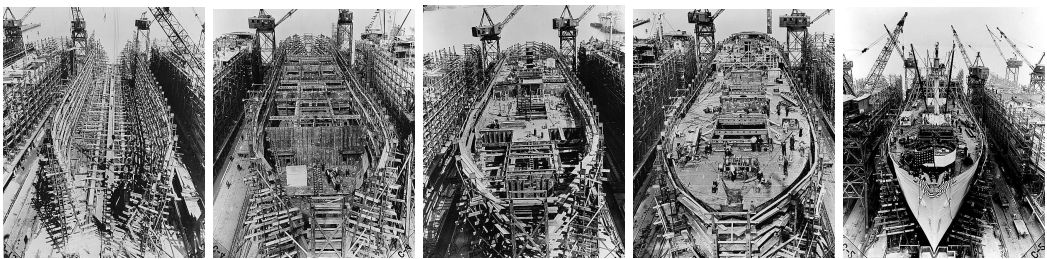

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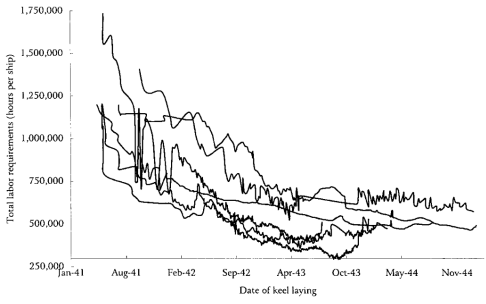

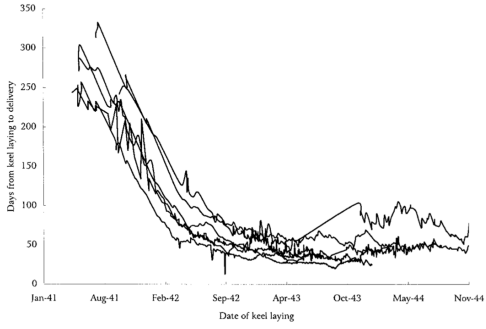

Productivity increased = labor and time requirements decreased → Why?

Liberty **shipbuilding**

- Two hypotheses based on yard-specific production function:

$$\underbrace{y_{it}}_{\text{output}} = A_i \times \underbrace{K_{it}^{\alpha}}_{\text{capital}} \times \underbrace{L_{it}^{\beta}}_{\text{labor}} \times \underbrace{E_{it}^{\gamma}}_{\text{experience}}$$

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   output gains were achieved through prior experience with shipbuilding

2. Capital investment:
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- We can use regression analysis to test these two hypotheses:

$$\log y_{it} = \log A_i + \alpha \log K_{it} + \beta \log L_{it} + \gamma \log L_{it} + \epsilon_{it}$$

Liberty **shipbuilding**

	Rapping (1)	Argote et al. (2)	Dependent Variable: Log Monthly Output in Ship Equivalents (3)	(4)	(5)	(6)
Log experience (cumulative output)	.110 (.013)	.44 (.03)	.493 (.025)	.481 (.027)	.291 (.045)	.263 (.037)
Log authorized ways	.293 (.096)	1.15 (.05)				
Log operating ways				.274 (.236)		
Log capital, K_{it}					.743 (.180)	.780 (.154)
Capacity utilization weight, $w_{it} = (6 + S_{it})/7$						.780 (.154)
Log labor hours	1.11 (.032)	.18 (.04)	.414 (.061)	.422 (.061)	.414 (.057)	.253 (.088)

output variable

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experience, capital, and labor variables

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role of experience after controlling for labor and different measures of capital

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1. Learning-by-doing: 51
   output gains were achieved through prior experience with shipbuilding
2. Capital investment: 51
   output gains were achieved with the installation of new infrastructure

- Capital investment played an important role, the impact of learning was modest

Industrialization in the American South

- The American South industrialized over the course of the postwar period
- Some observers attributed this to the influx of capital during World War II
  - Prewar: FDR declared the region "the nation's no. 1 economic problem" in 1938
  - Postwar: "The South. . . was no longer the nation's no. 1 economic problem" in 1945
- The South accounted for larger fraction of wartime investment then its share of manufacturing, which justifies hypothesis that war would facilitate regional development
- However, just as conversion during the war was costly so too was conversion after the war–share of wartime expansion was useful for peacetime production around 15 percent

Women at work in war

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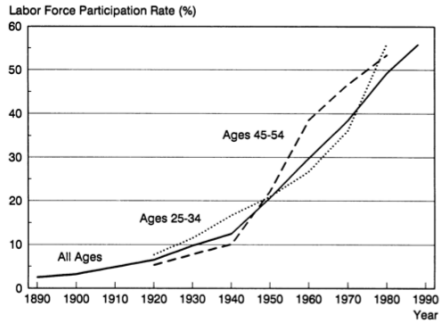

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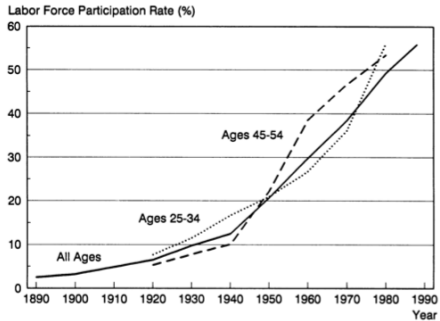

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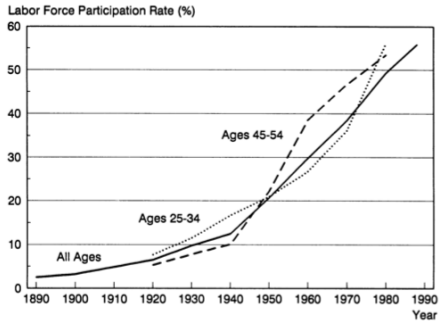

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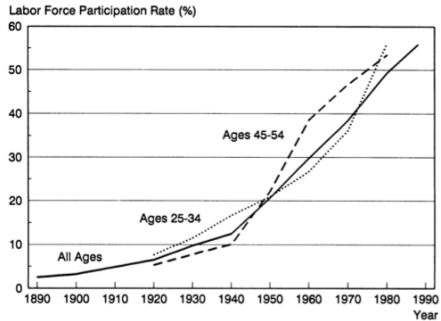
- Increases in women's LFP were the result of changes taking place over entire 20thC



The **cost** of World War II

- War is costly and American wars are particularly so because they are capital-intensive (rather than labor-intensive)
- To finance wars, governments use a combination of inflation (printing money), borrowing, and taxation plus the draft
- Going to war requires mobilizing resources for particular military uses which implies conversion costs in the form of wage, price, production controls, etc
- The end of war also implies costs in terms of reconversion of production capacity to peacetime uses and adjustments for individuals (e.g., veterans)
- So, how costly was World War II (and America's other 20thC wars)?

The **cost** of World War II

- The growth of expenditures outpaced receipts
- The tax base, marginal tax rates increased
- Wage, price, and production controls imposed
- The draft brought 10 million into the military

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Armed forces[a]	3,023	170.1
International affairs[b]	120	6.8
Other war-related federal expenditures[c]	42	2.4
Additional cost of the draft[d]	63	3.6
Expenditures by state and local governments and private organizations[e]	43	2.4
Subtotal	3,291	185.3
Historical and projected veterans' benefits[f]	1,373	77.3
Total	4,664	262.5

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	Costs during the period of active conflict (billions of current dollars)	Costs during the period of active conflict in constant dollars (billions of 2008 dollars)	Costs during the period of active conflict as a share of average GDP during the war[a] (%)	Veterans' benefits discounted to the midpoint of the war at 4.5% (billions of 2008 dollars)	Total costs (billions of 2008 dollars)	Total costs as a share of average GDP during the war (%)
Spanish–American War (1898–9)	0.274	6.3	1.46	17.92	24.22	5.6
Philippine–American War (1899–1902)	0.230 (0.211)	4.9	1.05	7.58	12.51	2.6
Turn-of-the-century imperialism (1898–1915)	3.073	60	11.17	25.50	85.58	15.6
World War I (1918–19)	32.020	313	43.00	305.7	618.22	82.3
World War II (1939–47)	320.315	3,291	185.30	1,373	4,664	262.5
Korean War (1950–5)	175.871	1,186	48.24	215.6	1401.77	57.0
Vietnam War (1967–74)	382.142	1,697	35.25	554.8	2,251.7	46.7

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- These costs should be weighed against benefits of traditional story