Lessons for the Green New Deal from the Economic Mobilization for World War Two

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Based on forthcoming Roosevelt Institute paper coauthored with Andrew Bossie
Some lessons from war mobilization:

1. Public sector needs to take direct role in investment
   ▶ ...and more broadly in bearing risk

2. Output can be very elastic in response to stronger demand
   ▶ Danger of over-conservative estimates of potential
   ▶ Labor supply also elastic in response to demand

3. Full employment has major effects on income distribution
   ▶ ... even in absence of explicit redistribution
## Public investment in war industries

### Public investment and share publicly owned at end of war

<table>
<thead>
<tr>
<th>Industry</th>
<th>Federal investment ($ billions)</th>
<th>% publicly owned, 1944-1945</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enriched uranium and plutonium</td>
<td>1.38</td>
<td>100</td>
</tr>
<tr>
<td>Shell and bomb loading</td>
<td>1.25</td>
<td>100</td>
</tr>
<tr>
<td>Synthetic rubber</td>
<td>0.70</td>
<td>97</td>
</tr>
<tr>
<td>Aircraft</td>
<td>3.43</td>
<td>89</td>
</tr>
<tr>
<td>Ships</td>
<td>2.19</td>
<td>87</td>
</tr>
<tr>
<td>Guns and ammunition</td>
<td>1.60</td>
<td>87</td>
</tr>
<tr>
<td>Nonferrous metals (aluminum, etc.)</td>
<td>1.72</td>
<td>58</td>
</tr>
<tr>
<td>Chemicals and explosives</td>
<td>2.26</td>
<td>43</td>
</tr>
<tr>
<td>Aviation fuel</td>
<td>0.25</td>
<td>33</td>
</tr>
<tr>
<td>Machine tools</td>
<td>0.15</td>
<td>26</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>1.2</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Mark Wilson, *Destructive Creation*
Early resistance to public investment

“Private sources will be expected to handle the greater part of capital demand from the war program that falls into the category of permanent expansion of plant” – Jesse Jones, chair of Reconstruction Finance Authority

Head of Investment Bankers Ass’n worries how “those of a socialist bent” will use “these new government-financed plants when the emergency ends.”

American Bankers Ass’n: “Future independence of business may depend on the extent to which the bankers finance defense orders.”

J. Howard Pew of Sun Oil: if war production “supinely relies on government control and operation, then Hitlerism wins even tho Hitler himself be defeated.”

Etc.
Direct public investment adopted as last resort

Wartime investment policies, in rough chronological order:

1. Tax credits - accelerated depreciation
2. Emergency Plant Facilities program - reimburses for private investment over 60 months
3. Reconstruction Finance Corporation loans - must be “sound”, “secured”, “assured of repayment”
4. V-Loans - guarantees for private loans
5. Defense Plant Corporation - direct federal investment
   - main vehicle for war investment
   - plants leased to private contractors (GOCO)
   - often option for contractor to purchase at end of war
6. Machine Tool Pool
   - guaranteed future orders for (mostly small) machine tool producers
   - government resells/distributes output to other contractors
Why so much direct public investment?

- Not desired by policymakers
  - Turn to direct federal investment only after measures to encourage private investment failed
- Not lack of financial capacity in private sector
- Private sector unwilling/unable to bear risk
- ... especially in newer industries
Lessons for Green New Deal

1. Decarbonization may call for large direct investment by public sector
   - as opposed to shifting private investment via prices/subsidies

2. Public role largest in new industries/technologies

3. Public role not just to provide resources, but to solve *coordination problems* and to *bear risk*
Second lesson: Capacity grows with demand

- At start of war, fears that military production targets could not be met without large fall in civilian living standards
  - the “feasibility dispute”
- But in fact, military production targets largely achieved
- ... without any fall in civilian consumption
- Rapid output growth thanks to expansion of labor force
- ... and rapid productivity gains, esp. in industries with greatest military demand
- Wartime inflation more about specific bottlenecks than overall capacity constraints

As largest positive demand shock in history, WWII is informative about supply constraints!
Surprisingly little crowding out during war

Military and civilian output, 1938-1947

Source: Rockoff 1998
... thanks in part to rapid growth in labor force

<table>
<thead>
<tr>
<th></th>
<th>1941</th>
<th>1944</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Nonagricultural Employed</td>
<td>42,800</td>
<td>56,600</td>
<td>13,800</td>
</tr>
<tr>
<td>War Manufacturing</td>
<td>6,571</td>
<td>8,301</td>
<td>1,730</td>
</tr>
<tr>
<td>Nonwar manufacturing</td>
<td>4,950</td>
<td>5,826</td>
<td>876</td>
</tr>
<tr>
<td>Government</td>
<td>6,222</td>
<td>17,426</td>
<td>11,204</td>
</tr>
<tr>
<td>Civilian</td>
<td>4,622</td>
<td>6,026</td>
<td>1,404</td>
</tr>
<tr>
<td>Military</td>
<td>1,600</td>
<td>11,400</td>
<td>9,800</td>
</tr>
<tr>
<td>Total Wartime Uses of Labor</td>
<td></td>
<td></td>
<td>13,810</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1941</th>
<th>1944</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>5,560</td>
<td>670</td>
<td>-4,890</td>
</tr>
<tr>
<td>Extra Workers (April 1945)</td>
<td>8,130</td>
<td>0</td>
<td>-8,130</td>
</tr>
<tr>
<td>Women</td>
<td>4,230</td>
<td>0</td>
<td>-4,230</td>
</tr>
<tr>
<td>Men</td>
<td>3,900</td>
<td>0</td>
<td>-3,900</td>
</tr>
<tr>
<td>Farm Workers (1940 and 1945)</td>
<td>10,585</td>
<td>9,844</td>
<td>-741</td>
</tr>
<tr>
<td>Total Wartime Sources of Labor</td>
<td></td>
<td></td>
<td>-13,761</td>
</tr>
</tbody>
</table>
Sources of output growth

Real output grows 80 percent 1939-1944. Of this, perhaps:

- 20 points from increased employment
- 20 points from longer hours
- 10 points from shift to higher-productivity sectors
- 10 points from growth of capital stock
- 20 points from total factor productivity

Source: Rockoff 1998
Consumer Price Inflation, 1939-1947

Source: Bossie 2019
Wartime experience of supply constraints

- Supply much more elastic than was expected
- Inflation reflected specific bottlenecks/shortages, not overall capacity constraints
  - effectively managed with rationing and price controls
  - rationing reflected rapidly rising civilian incomes, not falling civilian consumption
- New entrants to labor force not mainly drawn from unemployed or agriculture
- Productivity gains fastest in industries with greatest military spending
  - Labor productivity in aircraft production rises by factor of 7 over 1942-1945
  - Supports strong version of Verdoorn’s law
Lessons for Green New Deal

1. Output may rise to meet new demand from decarbonization
   - Good reasons to think there is substantial slack in major economies
   - Should not analyze economics of climate change on basis of fixed total output

2. Labor force growth responsive to demand conditions

3. Rising inflation does not necessarily mean capacity constraints reached

4. Decarbonization spending likely to see increasing returns
   - Implies lower costs than static estimate
   - Another argument for targeted public investment, against carbon price based approach
     - carbon price v. inefficient for moving new technologies down cost curve
Reason to think substantial excess capacity today
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Deviation from long-run trend suggests much larger gap

Real Per-Capita GDP and 1947-2007 Trend

for 1st time since WWII, no return to trend after recession
Reason to think substantial excess capacity today

Still a point below 2000s peak, 2 points below late 1990s
Third lesson: Full employment is powerful force for redistribution

▶ 1940s saw the largest compression of incomes in US history
  ▶ as in most advanced countries
▶ Lowest paid groups (African Americans, agricultural workers) gained most
▶ Very little direct redistribution - all about labor market
Income compression during WWII
Income compression during WWII

1940 hourly wage by industry and 1940-1946 change
Income compression during WWII

- Wage differentials across sectors/industries narrowed substantially during war
- Biggest gains in low-wage industries not directly involved in war production
- Over 1939-1946, weekly wages:
  - in war manufacturing rose 70%, from $29 to $70
  - in textiles/apparel doubled, from $17.50 to $36
  - in agriculture nearly tripled, from $9 to $26
- No explicit policy favoring compression - wage caps based on average wages at start of war
  - so inter-industry wage gaps narrowed despite policy to maintain them
Black workers made biggest gains
... but only thanks to overall wage compression

Percentage-point change in median wage gap

- Anti-discrimination policy during the war largely toothless
A. Distributional Convergence
B. Positional Convergence
Limited redistribution through wartime tax increases

Effective Tax Rate by Income Class 1938 vs 1944

- 1938: 0.5% less than 5k, 2.6% $5k to $10k, 15.7% More than $10K, 13.2% Corporate
- 1944: 9.65% less than 5k, 13.08% $5k to $10k, 38.47% More than $10K, 13.2% Corporate

- No effort to tax capital gains
Lessons for Green New Deal

1. A just transition important, but don’t underestimate redistributional effects of strong demand
   - WWII experience suggests that sustained super-full employment more powerful for income compression than direct redistribution
   - Strong labor markets benefit even those who aren’t employed directly

2. Full employment is most important for most disadvantaged workers

3. Goal of more equitable distribution is independent argument for big public spending program
Labor market conditions still affect distribution

Wage Growth, Bottom Quartile and Overall

When unemployment is low, low-wage workers catch up.

When unemployment is high, low-wage workers fall behind.
Summary

Three lessons from wartime mobilization:

1. Rapid economic transitions require larger role for direct public investment
2. Output, employment are more elastic than conventional estimates of potential assume
3. Full employment is powerful force for income compression, even without explicit redistribution
Thank you.