Energy, Motorization, and the End of Empires

Jeff Colgan
Brown University

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New Research Project

• What explains the 20th c. decline of empires?

Costliness of WWII

Normative change
Argument in a nutshell

• **Claim**: Motorization (aka energy modernization) weakened the underlying economics of empire
  – Three causal mechanisms

• Energy modernization occurred in European metropoles 1945-73, contributing to a wave of decolonization and acceptance of new norms

• Theoretical focus on energy helps explain variation missed by other explanations
Unique transition

• Changes in technology have long been linked to the rise and fall of empires
  – Gartzke and Rohner 2011, Gilpin 1981

• But what explains unique, simultaneous end to empire?

• Motorization is unique because it allowed energy to substitute for land, labor
  – From (Land, Labor) to (Capital, Labor) economic model
What is motorization?

• Definition
  – Occurs when engines powered by fossil fuels or electricity become the predominant basis for transportation and physical economic output
  – Distinct from 19th-century industrialization
  – Operationalized as 20+ bls of oil-equiv. energy/capita

• By sector …
  – Transportation: cars, planes dominant
  – Agriculture: energy substitutes for land
  – Industry: heavy machinery substitute for labor
When is motorization?

<table>
<thead>
<tr>
<th>Stage</th>
<th>Country</th>
<th>Motorization</th>
<th>End of Imperialism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>USA</td>
<td>1903</td>
<td>1902-1918</td>
</tr>
<tr>
<td>Middle</td>
<td>UK</td>
<td>1900-1950*</td>
<td>1947-1968</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>1970</td>
<td>1954-1968</td>
</tr>
<tr>
<td></td>
<td>Belgium</td>
<td>1956</td>
<td>1960</td>
</tr>
<tr>
<td></td>
<td>Holland</td>
<td>1961</td>
<td>1945-1949</td>
</tr>
<tr>
<td>Late</td>
<td>Portugal</td>
<td>1980s</td>
<td>1974</td>
</tr>
</tbody>
</table>

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Theory

• Motorization creates incentives for decolonization (generally)
  – Shift in metropole’s balance of winners and losers from empire
  – Rising domestic productivity = high opportunity costs of deploying military personnel
  – Change in FDI patterns, reducing need for colonies

• But motorization also increases the value of oil reserves
British support for empire 1830-1980

CONCEPTUAL/ILLUSTRATIVE

Share of British politics

Other opponents
Financial sector
Motorized industry
Other Supporters
Iron & steel
Textiles
Landowners
UK textile industry, 1830-1960
Real wages in Western Europe

Rising wages reflect rising domestic productivity = higher opportunity costs of military occupation.
Policymakers’ views

- British cabinet memo:

  “it is not in fact possible to recruit large bodies of men for defence purposes without prejudicing the supply of labour to local industrial and agricultural projects whose output is important ... in the economic sphere”

  - 1951, T. Smith in DEFE 7/415, no. 5a
Petro-colonies

- Motorization increases the payoff to petro-colonies, making decolonization harder

<table>
<thead>
<tr>
<th>Non-oil rich colonies</th>
<th>Petro-colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>India 1947</td>
<td>Qatar 1973</td>
</tr>
<tr>
<td>Africa 1960s</td>
<td>UAE 1973</td>
</tr>
<tr>
<td>Malaya 1957</td>
<td>Brunei 1984</td>
</tr>
<tr>
<td>Singapore 1963</td>
<td>Bahrain 1971</td>
</tr>
<tr>
<td>Cyprus 1960</td>
<td></td>
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</table>
Conclusion

• Energy modernization facilitated the end of empire by changing the economic incentives

• Theoretical contributions
  – Adds to the normative explanation of decolonization
  – Challenges the “energy as a cause of war” literature
  – Challenges the cyclical theories of empire
Energy Modernization and the End of Empires

Jeff Colgan
Brown University

August 2014
Appendix
## Summary of findings

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Evidence</th>
<th>Theoretical contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorization and modern energy consumption supports decolonization and reduces payoff to territorial conquest (H1)</td>
<td>Variation in decolonization timing among metropoles explained in part by motorization: US first (early 20th century), then a cluster of empires post-1945 (UK, France, Holland, Belgium), then Portugal</td>
<td>- Complements the “rise of nationalism” explanation of decolonization - Serves as a corrective to conventional view of energy as a cause of war</td>
</tr>
<tr>
<td>Timing of decolonization and acceptance of sovereignty norms explained in part by energy modernization (H1a, b, c)</td>
<td>In UK and elsewhere, economics of empire worsened as metropoles motorized, facilitating norm acceptance</td>
<td>Complements the “rise of nationalism” explanation of decolonization</td>
</tr>
<tr>
<td>Simultaneous decline of empires occurs when motorization and modern energy are widely available (H2)</td>
<td>Overseas empires disappear nearly simultaneously 1945-1975, an event not explained by most cyclical theories</td>
<td>Challenges cyclical theories of the rise and fall of empires</td>
</tr>
<tr>
<td>Variation in timing of decolonization among colonies explained in part by energy modernization (H3)</td>
<td>Petro-colonies late to achieve independence compared to non-petro-colonies; metropoles try to retain influence in petro-colonies</td>
<td>Complements the “rise of nationalism” explanation of decolonization</td>
</tr>
</tbody>
</table>
Energy Revolution 1945-1973

- Energy-modern = any state that consumes >20 barrels of oil-equivalent energy per capita in a given year

- Energy revolution = starts with development of nuclear energy, ends with 1973 oil crisis

- In between, greatest growth in global energy consumption in human history
UK overseas income, 1896-1948
Rate of energy growth
1816-2008

Figure 2
Table A-1: Energy consumption per capita for select countries, 1816-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>USA</th>
<th>UK</th>
<th>Russia</th>
<th>Germany</th>
<th>France</th>
<th>China</th>
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<tbody>
<tr>
<td>1816</td>
<td>0.1</td>
<td>5.5</td>
<td>0.0</td>
<td>0.6</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>1850</td>
<td>1.6</td>
<td>10.3</td>
<td>0.0</td>
<td>1.7</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1900</td>
<td>16.1</td>
<td>21.6</td>
<td>1.2</td>
<td>10.5</td>
<td>6.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1939</td>
<td>30.3</td>
<td>22.0</td>
<td>5.1</td>
<td>15.3</td>
<td>9.1</td>
<td>0.3</td>
</tr>
<tr>
<td>1970</td>
<td>57.7</td>
<td>30.4</td>
<td>27.8</td>
<td>29.2</td>
<td>23.0</td>
<td>2.6</td>
</tr>
<tr>
<td>2007</td>
<td>88.1</td>
<td>53.7</td>
<td>52.5</td>
<td>67.4</td>
<td>55.3</td>
<td>14.9</td>
</tr>
</tbody>
</table>

Units: Barrels of oil-equivalent per capita