Did Watt’s patent delay the Industrial Revolution?
Was birth of modern economic growth—sustained technical change—delayed by Watt’s patent?

<table>
<thead>
<tr>
<th>Period</th>
<th>In industry</th>
<th>In economy as whole (GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1381-1759</td>
<td>0.14</td>
<td>0.18</td>
</tr>
<tr>
<td>1759-1801</td>
<td>0.57</td>
<td>0.44</td>
</tr>
<tr>
<td>1801-1851</td>
<td>1.23</td>
<td>0.74</td>
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</tbody>
</table>

Better than US manufacturing 2007-2017 (0.7%/year)
But Industrial Revolution was not locomotive; above all else, it was cheap printed textiles.

Steam essential power? No: in 1838, 46% of cotton mills had no steam power, and water flow had significant effect on textile mill location—local coal prices didn’t.
Watt still poster child for ills of patent system

• 4 claims made about Watt’s patent
  • blocked cumulative invention—high pressure steam
  • exaggerated Watt’s role in what was cumulative invention
  • Watt didn’t care about it—not an incentive
  • With it Watt stopped inventing to collect monopolist royalties

• Bottomley refutes each these claims
  • His argument persuasive
  • What to add?
Other evidence supports: Arkwright battled to get patents and protect them.
Patents may have even encouraged cumulative invention in Britain

- Apprenticeships rose in response to patents (Feldman and van der Beek)
  - especially in mechanical trades useful in making machines
- London inventors responded to patenting outside the city when patentees have to provide technical specifications (Cox)
- One question: was there still incentive to use Hornblower’s high pressure engine after Watt’s victory 1799?
  - Did Bolt and Watt charge for saving due to their condenser only? Or total savings?
  - Seems there was still incentive to use high pressure engine.
Point worth emphasizing more: Watt does not stop inventing to collect monopoly rents

- Crux of argument that patents unrelated to technical change
  - Firms patent when they stop innovating and shift to collecting monopoly rents—late life cycle of invention
- As example Watt doesn’t work
  - 1769 patent extended in 1775 to 1800
  - Sales of manufactured goods only reach 1,000 £ in 1785
  - Watt continues to invent: sun & planet gear (1781), double acting cylinders and parallel motion (1782), centrifugal governor (1788)