The potential for improvement in on-road truck fuel economy: evidence from the VIUS

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The Potential for Improvement in On-road Truck MPG

Policy Targets (EPA & NHTSA)
Model Year 2014-2018 (Phase 1),
- Reduction in fuel consumption:
  ➢ Combination trucks: 20%
  ➢ Vocational vehicles: 10%
Model Year 2018 - 2027 (Phase 2)
- Combination trucks: 24%
- Vocational vehicles: 16%

Research Question:
Can we achieve the targets? How?
- Estimate the dynamic baseline of MPG improvement
- Estimate the trade-off between MPG and truck attributes

Data:
- U.S. Vehicle Inventory and Use Survey (1982-2002)
- Truck-level micro data

Method:
- OLS Estimation with Fixed Effects
- Oaxaca-Blinder Decomposition

Graphical Evidence

Empirical Evidence

\[
\ln \text{MPG}_i = \alpha_1 \ln \text{Weight}_i + \alpha_2 \ln \text{CID}_i + \text{MY}_i \gamma + \mathbf{X}' \beta + \epsilon_i
\]

<table>
<thead>
<tr>
<th></th>
<th>Main (OLS)</th>
<th>Aggregate^</th>
<th>Oaxaca</th>
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</thead>
<tbody>
<tr>
<td>Base Year</td>
<td>1973</td>
<td>1973</td>
<td>1973-75</td>
</tr>
<tr>
<td>Total tech progress</td>
<td>30.87%</td>
<td>25.11%</td>
<td>29.93%</td>
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<tr>
<td>Annual Rate</td>
<td>0.93%</td>
<td>0.78%</td>
<td>0.97%</td>
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<tr>
<td>Predict in 10 yrs</td>
<td>8.71%</td>
<td>7.20%</td>
<td>9.12%</td>
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<td>Phase 2 target</td>
<td>31.52%</td>
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Trade-off coefficients
- Vehicle Weight: -0.105*** -0.147*** -
- Engine Displacement: -0.0148*** -0.0197*** -
- No. of Observations: 99,426 11,789 -
- R-squared: 0.202 0.534 -

Note: ^ Data are aggregated by fuel type, model year, body/trailer type, and vehicle make. Probability weight is considered.
Main OLS and Oaxaca estimations control for fuel type, primary cargo, body/trailer type, manufacturer FE, survey year FE, and region FE. Aggregate estimation controls for fuel type, body/trailer type, and manufacturer FE.