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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

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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

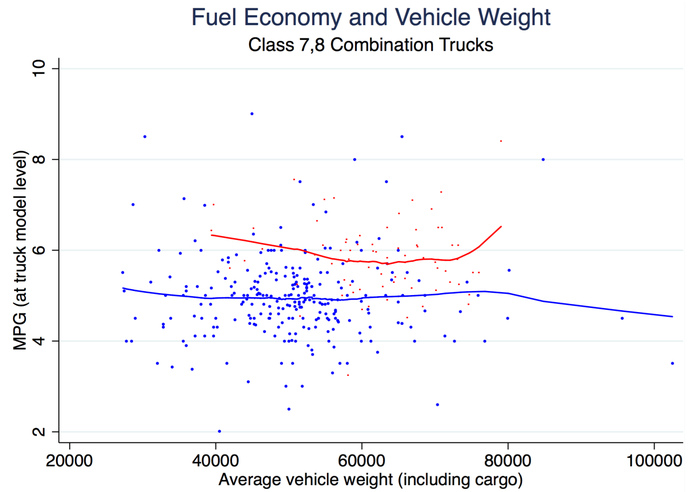
Data:

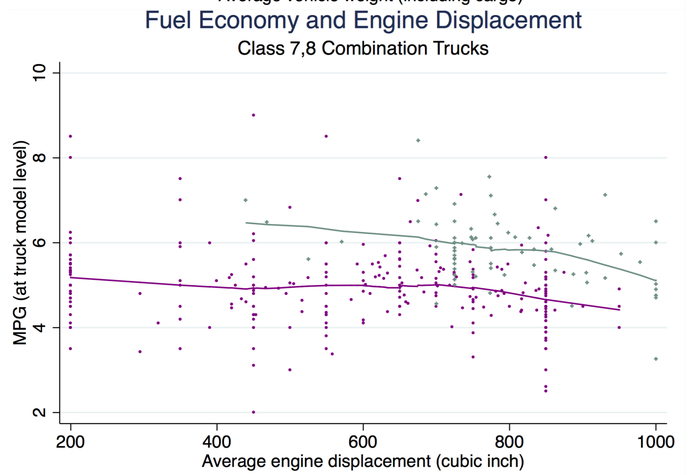
- U.S. Vehicle Inventory and Use Survey (1982-2002)
- Truck-level micro data

Method:

- OLS Estimation with Fixed Effects
- Oaxaca-Blinder Decomposition

Graphical Evidence





Empirical Evidence

$$\ln MPG_i = \alpha_1 \ln Weight_i + \alpha_2 \ln CID_i + \mathbf{MY_i}'\gamma + \mathbf{X}'\beta + \varepsilon_i$$

	Main (OLS)	Aggregate^	Oaxaca
Base Year	1973	1973	1973-75
Total tech progress	30.87%	25.11%	29.93%
Annual Rate	0.93%	0.78%	0.97%
Predict in 10 yrs	**8.71%**	**7.20%**	**9.12%**
Phase 2 target	**31.52%**		
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.