

Abstract #: 284

Author Name: Alan Jenn

Author Company: Carnegie Mellon University

Second Author's Name: Ines Azevedo

Abstract Title: How policies shape pricing and fuel efficiency strategies for vehicle manufacturers in a Nash equilibrium framework

Abstract Text:

Transportation accounts for approximately 40% of GHG emissions in the US. As a result, there are a number of climate mitigation policies promoting fuel efficiency and the adoption of alternative fuel vehicles (AFVs). Our work examines the effect of these policies, the Corporate Average Fuel Economy (CAFE) and Zero Emissions Vehicle (ZEV) mandate, using a Nash equilibrium model. We estimate a consumer demand model using a discrete choice legit model trained to historical vehicle sales data. The demand model is incorporated into a manufacturer profit maximization optimization (non-linear, non-convex program) as they producers change price points and fuel efficiencies of their respective vehicle models. Our results indicate that manufacturers will often use pricing strategies for compliance rather than improving fuel efficiency technologies.

Nevertheless, compliance with CAFE and ZEV result in substantial emissions reductions, in particular the pairing of the policies lead to synergistic adoption of AFVs that are not observed with either of the policies implemented separately.