The Implications of Pre-Existing Market Power Distortions for Electric Vehicle Tax Policies: Evidence from Colombia

Supplementary Materials:

Data (Folder):

This folder contains public data on vehicle prices in Colombia gathered from "El Motor" magazine. It also includes information on vehicle specifications, including emissions. Inside this folder, you will find PDF files of the original magazine publications and the Python code to access the data.

El Motor Prices (Folder):

Contains Excel files compiling all the data from "El Motor."

Scrape NAN Car Specifications (Folder):

Includes code and scraped data on vehicle specifications. We utilized the following websites: 'https://www.carfolio.com/car-makes/' and 'https://www.tucarro.com.co/'

Data_prep (Jupyter Notebook (Python 3.7)):

This notebook entails the estimation and extrapolation of NaN specifications. It was used when data was unavailable on the main source (IHS data) or secondary source (scraped websites). Prices were not extrapolated.

Validation (Jupyter Notebook (Python 3.7)):

Used for the validation of extrapolated data using observed data.

Model Estimation (Folder):

Contains the code for market equilibrium modeling using a Random Coefficient Discrete Choice Model (BLP). There are two variations of the model: Demand and Supply jointly estimated, and Demand only.

Demand and Supply (Folder):

Code for jointly estimated demand and supply:

Main (Matlab R2017a Code):

Runs the model, loads the data, and calls functions.

Objective Function (Matlab R2017a Code):

Executes the Generalized Methods of Moments objective function.

Contraction (Matlab R2017a Code):

Utilizes a contraction mapping to obtain observed market shares.

Markup (Matlab R2017a Code):

Computes markup using the inverse of elasticity.

Mktshares (Matlab R2017a Code):

Computes product market share within a market.

Ind_share (Matlab R2017a Code):

Computes individual shares.

Exp_mu (Matlab R2017a Code):

Computes the non-linear part of the utility function.

Elast_blp (Matlab R2017a Code):

Computes BLP elasticity by product.

Change_ms (Matlab R2017a Code):

Computes changes in market share, used in counterfactuals.

Covar (Matlab R2017a Code):

Computes the variance-covariance matrix for estimated parameters.

Getranddraw (Matlab R2017a Code):

Retrieves random draws for random coefficients.

Demand only (Folder):

Assuming perfect competition:

Main_DO (Matlab R2017a Code):

Runs the model, loads the data, and calls functions.

Objective Function:

Executes the Generalized Methods of Moments objective function.

Contraction (Matlab R2017a Code):

Utilizes a contraction mapping to obtain observed market shares.

Mktshares (Matlab R2017a Code):

Computes product market share within a market.

Exp_mu (Matlab R2017a Code):

Computes the non-linear part of the utility function.

Elast_blp (Matlab R2017a Code):

Computes BLP elasticity by product.

Covar (Matlab R2017a Code):

Computes the variance-covariance matrix for estimated parameters.

Getranddraw (Matlab R2017a Code):

Retrieves random draws for random coefficients.

Simulation (folder):

Code for scenario simulations. Contains two folders: Oligopolistic competition and Perfect competition.

Monopolistic Competition (Folder):

Code for scenario simulation:

Main_sim (Matlab R2017a Code):

Runs the model, loads the data, and calls functions.

Markup (Matlab R2017a Code):

Computes markup using the inverse of elasticity.

Mktshares (Matlab R2017a Code):

Computes product market share within a market.

Ind_share (Matlab R2017a Code):

Computes individual shares.

Exp_mu (Matlab R2017a Code):

Computes the non-linear part of the utility function.

Getranddraw (Matlab R2017a Code):

Retrieves random draws for random coefficients.

New_eq (Matlab R2017a Code):

Computes a new equilibrium for various scenarios.

New_pr (Matlab R2017a Code):

Computes equilibrium prices for counterfactual scenarios.

New_eq_sj (Matlab R2017a Code):

Computes a new equilibrium using a fiscal cost target.

New_sj (Matlab R2017a Code):

Computes new prices and quantities for counterfactual scenarios while keeping a target fiscal expenditure.

New_eq_CT (Matlab R2017a Code):

Computes a new equilibrium for a carbon tax scenario.

New_sj_CT (Matlab R2017a Code):

Computes new prices and quantities for carbon tax scenarios.

New_eq_CT_2 (Matlab R2017a Code):

Computes a new equilibrium for a carbon tax scenario with a target fiscal cost.

New_sj_CT_2 (Matlab R2017a Code):

Computes new prices and quantities for carbon tax scenarios while keeping a target fiscal expenditure.

Perfect Competition (Folder):

Code for scenario simulation:

Main_sim_PC (Matlab R2017a Code):

Runs the model, loads the data, and calls functions.

Mktshares (Matlab R2017a Code):

Computes product market share within a market.

Exp_mu (Matlab R2017a Code):

Computes the non-linear part of the utility function.

Getranddraw (Matlab R2017a Code):

Retrieves random draws for random coefficients.

New_eq_tt (Matlab R2017a Code):

Computes a new equilibrium for various scenarios.

New_eq_TT2 (Matlab R2017a Code):

Computes a new equilibrium for a carbon tax scenario with a target fiscal cost.