Retail Behavior in the E10 Market

James Bushnell and Jonathan McFadden

Iowa State University and NBER

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Motivation: The Blend Wall

- Obviously, we all like Ethanol
  - US Mandates 30 Billion gallons of biofuels by 2022
  - US Gasoline demand about 130 Billion gallons
  - Most common product, E10, not sufficient to absorb all that biofuel
- For market to absorb 25-30 Billion gallons will need some combination of
  - Rapid expansion of E85 infrastructure (pumps, flex-fuel cars)
  - Adoption of higher blends (E15) in conventional cars
  - Deployment of drop-in fuels
The Iowa Retail Fuel Market

- What are customer & producer preferences?
  - Hypothesis: Producers can earn higher profits selling large quantities of E10 or E15 than smaller quantities of E85. Customers will price the energy differential in E85 but not in lower blends.
  - Do customers value biofuels according to energy difference or have some other preferences at play?
  - Not any empirical evidence for this because demand for E10 hard to identify relative to other blends
- In Iowa E10 is marketed and labelled distinctly from “clear” gasoline
  - in ‘most’ places 89 octane E10 priced and sold next to 87 ‘clear’
Iowa Retail Ethanol
Iowa Labeling Law

- Original Iowa labeling requirement is contained in 1982 State Acts, c. 1170, § 2, Senate File 2091
- As of April 29, 1982, all retailers selling gasoline with ethanol were required to post a notice on the pump stating "ethanol blend"
- Current law is in the Iowa Administrative Code, c. 85, Rule 21.85.48
- Any fuel containing over 1% of a renewable fuel, such as ethanol-blended gas or certain types of biodiesel, must have a pump decal
- There are at least two distinct decals approved for use by the Renewable Fuels and Coproducts Advisory Committee
Possible Demand Models

- Rod Williamson model
  - Customers divided into ethanol ‘haters’, ethanol ‘lovers,’ and price-arbitragers

- Bruce Babcock (price-arbitrage) rule
  - Energy content of E10 about 97% of clear
  - Standard difference in Iowa is 10 cents
  - Buy gasoline whenever price is over $3.00/gallon
Retail Prices

- Monthly gross retail price data are from the Oil Price Information Service (OPIS)
- Sample period is 02/1996 - 09/2010 (14 years, 8 months)
- Prices are for gasoline sold as regular, midgrade, and premium, usually corresponding to 87, 89, 91 octane
- Price data do not indicate ethanol content
Iowa Sales Volume Data

- Monthly retails sales volumes are from the Iowa Dept. of Revenue
- Retailers are required to remit motor fuel taxes electronically each month
- Volumes indicate gallons sold of clear gasoline, E10, E85, and other fuels
- Data exist for taxed quantities and gross (of exports, spillage) quantities
- Gas and E10 tax rates changed 10, 3 times over sample period, respectively
## Retail Prices & Volumes

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Carbon Offsets

May, 2011

10 / 14
Share E10

Data Sources and Summary

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Carbon Offsets
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Price Ratio and Shares

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## Preliminary Analysis

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Confounding Issues

- Premium (91 Octane) is marketed as both clear and E10 in differing places
  - Kind of screwed with this data set on this point
  - 91 a small share of Iowa market - make assumptions about E10 content to bound elasticities
- Distinguishing octane preferences from ethanol preferences
  - One should be a constant value while energy difference is felt as % of price
  - Learn something about octane preferences from neighboring states?
- Interpretations
  - Customers are ‘fooled’ and are paying too much
  - Energy difference not noticeable at 10% levels
  - Energy difference exactly offset by octane gains??