

The effects of carbon taxes on new vehicle purchases: evidence from British Columbia

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Introduction

Personal transportation represents a significant portion of household greenhouse gas (GHG) emissions in Canada (Statistics Canada). In an attempt to include the social costs associated with GHG emissions, British Columbia (BC) has become the first jurisdiction in North America to introduce a carbon tax on all fossil fuels, beginning July 1st 2008. With the implementation of the new carbon tax, motor fuels sold within the province of BC are taxed at a fixed rate, which is included in the price of the fuel at the pump. This is the first research that looks into the effects of this carbon tax on new vehicle purchase decisions by households. It focuses on differences in new vehicle purchases within BC relative to the remaining provinces of Canada.

Data

The data used in this research is the proprietary information of DesRosiers Automotive Consultants Inc. It contains the fuel consumption characteristics for the **entire population** of 10,872,867 new vehicles sold in the ten provinces of Canada during the years 2000 to 2010.

Methodology

For comparison of household new vehicle purchase decisions between BC and the rest of Canada (RoC), the auto market is broken into the three largest market share vehicle classes and the sales weighted average combined highway and city fuel efficiency is calculated for both regions and compared graphically.

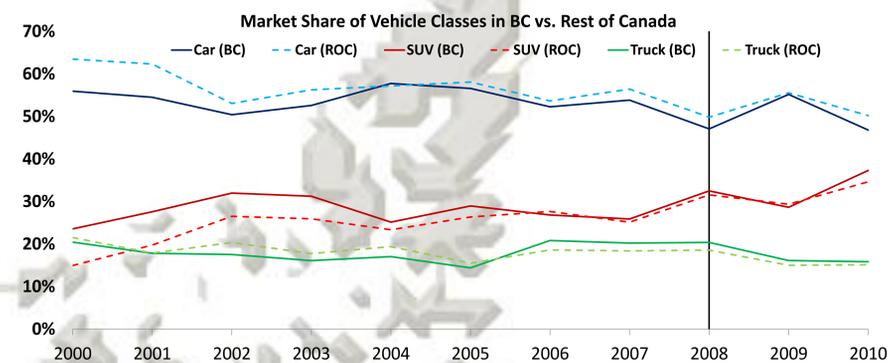
Definition of terms

Combined Fuel Efficiency Statistic: The combined fuel efficiency statistic is a weighted average of 55% of the vehicles advertised city fuel efficiency and 45% of the vehicles advertised highway efficiency fuel efficiency (Natural Resources Canada).

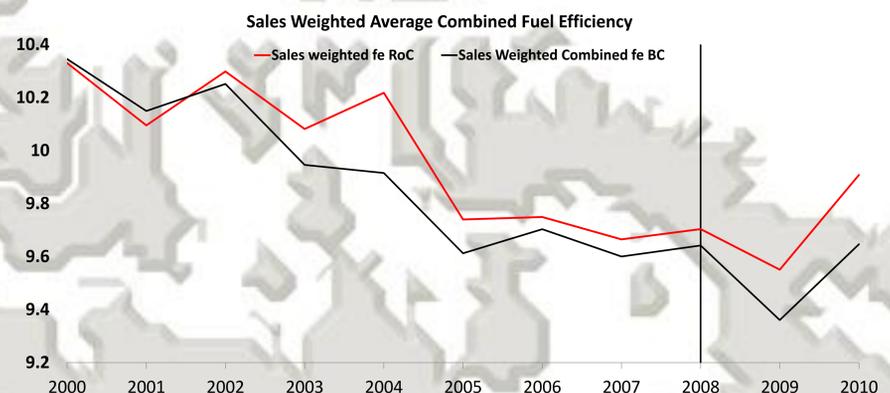
Sales Weighted Average: The sales weighted average statistic is used to reflect average fuel efficiency of the entire fleet of vehicles sold in a region.

Share of Total Fuel Consumption: This statistic reflects the portion of fuel burned within a vehicle class by region as a percentage.

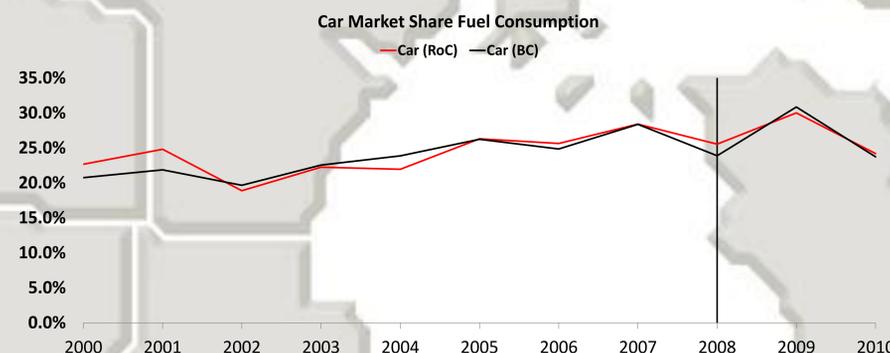
Results



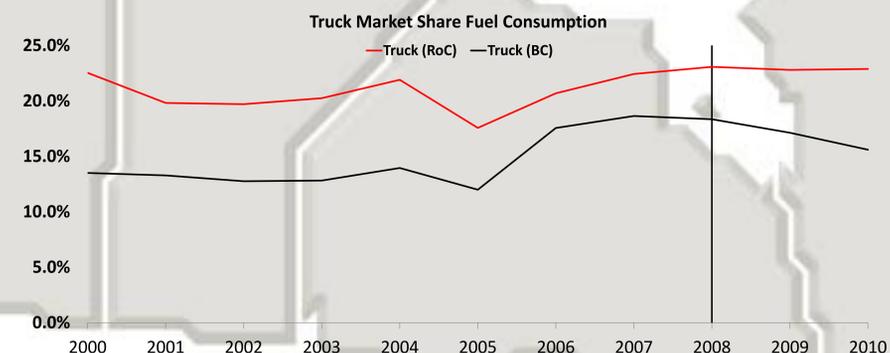
Comments: Vertical line indicates implementation of carbon tax in 2008. Note little difference between the market shares of vehicle classes in BC relative to Rest of Canada.



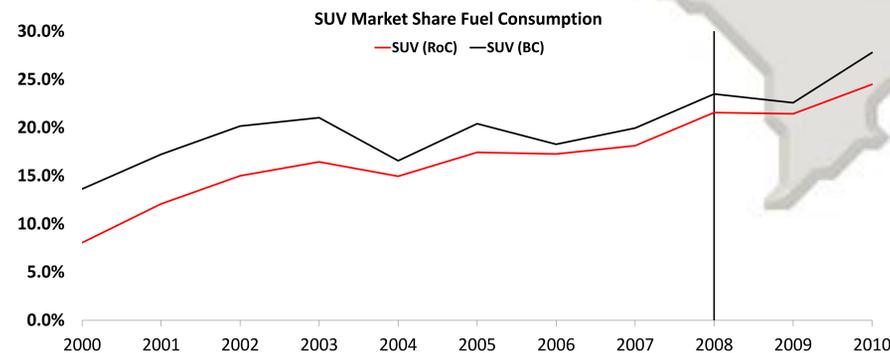
Comments: The sales weighted average combined fuel efficiency is similar in trend to the remainder of Canada, however the sales weighted average fuel efficiency in BC are marginally better.



Comments: There are nearly identical trends and magnitude observed over period of time studied.



Comments: Trends in both regions similar until 2008, (year carbon tax is implemented) however after 2008 a slight but noticeable downward trend is observed in BC. Additionally BC's fleet of trucks is more fuel efficient than that of the rest of Canada.



Comments: Trends in both regions similar throughout the sample period, however a slight but noticeable decrease in fuel efficiency is observed in BC. Additionally BC's fleet of SUV's are less fuel efficient than that of the rest of Canada.

Discussion

Motor vehicles are a durable good, and short term motor fuel demand is relatively inelastic, therefore households within BC would likely not have had an opportunity to modify their behaviours within the time period studied. To obtain a clearer picture of the impacts of carbon taxes on new vehicle purchases, more data from the years after the implementation of the carbon tax would be required.

Conclusions

This research indicates that the carbon tax on motor fuels in BC has had an effect on the new vehicle purchase decisions within BC relative to the remainder of Canada, most notably in the market segment where fuel efficiency is the lowest, light duty trucks. This however is contrasted by an increase in the fuel consumption by SUV's in the BC market relative to the rest of Canada.

Acknowledgments

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