

ASSESSING THE EFFECT OF ENVIRONMENTAL FEEBATE OF PRIVATE CARS ON ECONOMIC WELFARE

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Overview

To encourage consumers to purchase low emission cars, countries implement environmental feebate programs. These schemes levy high purchase taxes on new cars with high emission levels, and rebate new cars with low emission levels. Such policies have been implemented in a number of countries, including the United States, France, Sweden, Japan, and Israel. However, the literature presents mixed results regarding these feebate schemes (e.g., Huse and Lucinda, 2014; Steren et al., 2022a). A critical question is whether there is any change in overall emissions, and if so, can this change be attributed to these feebate policy measures. We investigate an environmental feebate scheme introduced in Israel in 2009. Whereas similar policy measures introduced in other countries at around the same time aimed at reducing only CO_2 emissions, the policy in Israel was more comprehensive in that it was the only feebate scheme in the world that included all 5 key car pollutants (CO_2 , NO_x , THC, CO, and PM).

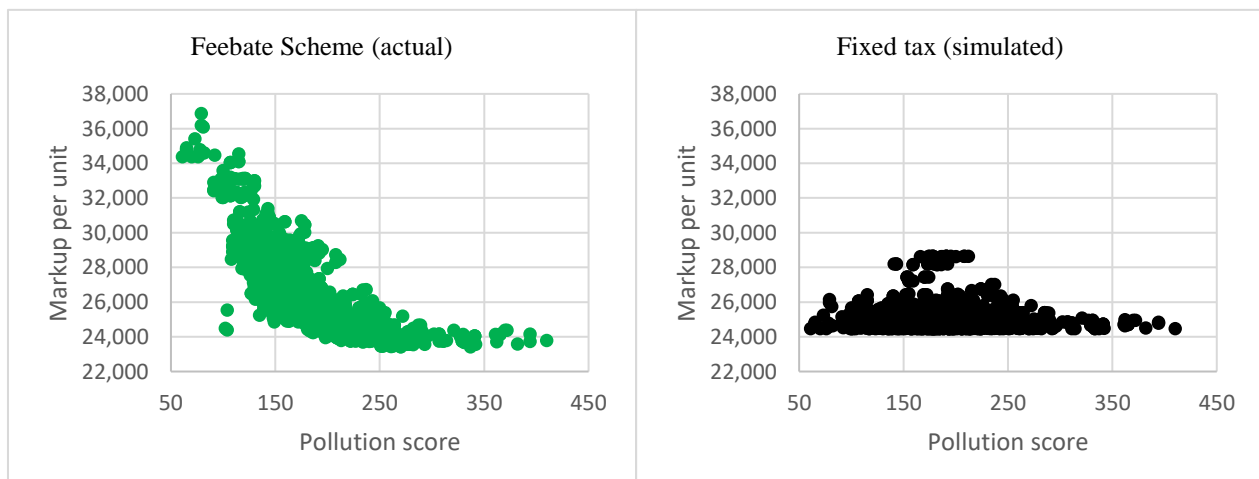
Methods

We use data from the Israel Ministry of Transport and Road Safety. These data include records of all new cars that were sold in Israel between 2007-2018. Each observation in our database represents a unique car product. This unique product is defined by numerous attributes, including manufacturer, brand, year, car category, car weight, engine size, propulsion technology, fuel type, gear type, number of airbags, sunroof, retail price, etc. We employ a differentiated products modeling approach to assess the market under the feebate scheme (Fershtman and Gandal, 1998; Kessler et al., 2023). We then conducted a series of simulations with the objective of estimating the changes in welfare and in pollution to a hypothetical situation in which the feebate scheme was not implemented, and the fixed tax levied before the introduction of the feebate scheme was still in effect. The aim was to compare welfare and pollution levels with versus without the environmental feebate mechanism, a frequent practice in similar studies (e.g., Durremeyer, 2022; Fershman et al., 1999).

Results

Our findings indicate that, under the feebate scheme, retail prices were higher and fewer cars were sold, thereby generating lower (higher) consumer (manufacture) surplus. Surprisingly, the feebate scheme has proven counterproductive to policymakers' intentions of decreasing emission, as emissions have increased. While the overall welfare effect of the policy was close to null, we show a positive association between the rebate size on a product (determined by pollution score) and manufacturer markup (Figure 1).

Figure 1. Per-product pollution score and manufacturers' average markup (New Israeli Shekels).



Conclusions

The present study is the first to investigate a policy that is more comprehensive than those of other countries, as it included not only CO_2 emissions but also CO, NO_x , THC, and PM, the latter four pollutants are critical dimensions of emissions affecting public health. Our finding suggests that manufacturers strategically took advantage of the environmental policy to increase their markups. As for emissions, the gradual decreasing trend in emissions seems to have been evident regardless of the feebate scheme, in line with the findings of Huse and Lucinda (2014). Reasons could be attributed to a global trend of technological progress. We discuss the policy implications of these results.

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