

# HOW EMISSIONS CHARGES AND FUEL-EFFICIENCY INFORMATION ARE PRESENTED ALTER CONSUMER CAR CHOICES

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## INTRODUCTION

One consequence of CO<sub>2</sub>-based emissions taxes has been an increase in popularity of diesel cars, which emit less CO<sub>2</sub> but more nitrogen oxide (NO<sub>x</sub>) than petrol cars. NO<sub>x</sub> emissions, however, also contribute to climate change and have harmful consequences for public health, including increased risk of respiratory problems and dementia. We used an experiment to test (1) whether a NO<sub>x</sub>-based tax instrument would be likely to influence the type of car consumers choose, and (2) whether the presentation of the tax would alter its impact. In addition, since fuel efficiency has important implications for the environment and consumer finances, we also tested (3) whether the way fuel efficiency information is presented alters choices.

## DATA AND METHODS

A representative sample of consumers (N = 95) took part in the computerised experiment. The experiment consisted of multiple trials in which participants were presented with information about two cars and decided which one they would prefer to purchase. We systematically varied how a NO<sub>x</sub> emission tax was presented in four ways: (i) not shown, (ii) incorporated into the annual motor tax, (iii) partitioned from the motor tax and (iv) amount of NO<sub>x</sub> emissions (in mg/km) was shown. We also varied how the fuel efficiency information was presented in three ways: (i) whether the scale was short or long (e.g. km per day or per year), (ii) whether the main unit was distance or time (e.g. kilometres or days driving) and

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(iii) whether the unit was presented per fixed price or the price per fixed unit (e.g. driving distance per €1,000 or running cost per 1,000km). Other factors were held constant. Hence, we could attribute any differences in choices to differences in the presentation of tax and fuel efficiency information and not to other features, such as the overall cost.

## **RESULTS**

The number of participants who chose cars with lower NO<sub>x</sub> emissions increased by 24% when the NO<sub>x</sub> charge was added to the motor tax, compared to trials without the tax. Partitioning the NO<sub>x</sub> tax from the annual motor tax had a stronger effect. The largest effect was observed when the tax was made salient by showing participants the milligrams per kilometre of NO<sub>x</sub> emissions.

Presentation of fuel efficiency information also altered participants' choices. Participants selected the most fuel efficient car more often when efficiency was communicated as the price per fixed unit of travel (e.g. running cost per 1,000km) than the travel units per fixed cost (e.g. driving distance per €1,000). There was little effect of presenting the main units in time or distance, or of the magnitude of the scale (short or long).

## **CONCLUSION AND IMPLICATIONS**

The study provides evidence that a NO<sub>x</sub>-based tax instrument, such as the one introduced into the Vehicle Registration Tax (VRT) in 2020, has the potential to shift consumer choices to cars with lower NO<sub>x</sub> emissions. However, simply incorporating the charge into the VRT is likely to lead to smaller changes in behaviour than other ways of presenting it. Increasing the salience of emissions charges can strengthen the effect, with consumers opting for cars with lower emissions more often when the tax and amount of emissions stand out. The study also shows that consumers benefit from fuel efficiency information that is communicated as the cost per fixed unit of use. The findings show that the presentation of information to consumers when purchasing cars is likely to have important implications for the environment and public health.

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