**CO₂-based vehicle taxes: encouraging the switch to fuel-efficient cars**

**Ireland introduced changes** to its vehicle tax system in July 2008. Higher taxes are now placed on vehicles which emit higher levels of carbon. A recent study has investigated how these fiscal policies influence the demand for new cars and how effective these changes are in reducing CO₂ emissions. The results suggest there will be an overall reduction in CO₂ emissions of 3.6-3.8 per cent, but with an annual loss of 191 million Euros in tax revenues.

By 2010, emissions from the transport sector in Ireland will rise by 180 per cent if reduction measures are not put in place. The EU has proposed a Council Directive (COM(2005)261final) on passenger car related taxes. One of the main benefits of such changes would be reduced CO₂ emissions through taxes based partly on carbon emitting potential of a vehicle. This is to encourage consumers to buy more fuel-efficient vehicles.

Using a car choice model, the researchers predicted the impact of the tax changes. They compared the Irish car tax system in 2007 with a number of different tax scenarios, especially the vehicle registration tax (VRT) and annual circulation tax (ACT) changes of July 2008. Under the new system, VRT and ACT are applied to categories of vehicles, with larger, more polluting vehicles being charged higher rates of tax. For example, vehicles which produced less than 120g of CO₂ per kilometre are taxed 100 Euros. At the other end of the scale, vehicles which emit over 226g of CO₂ per kilometre are taxed 2000 Euros.

The results suggest that the change to a carbon-based ACT and VRT will lower CO₂ exhaust emissions by 3.8 per cent from petrol vehicles and by 3.6 per cent from diesel vehicles. Consumers are more likely to purchase more fuel-efficient cars, with a 7 per cent shift to smaller petrol vehicles and a 2 per cent shift to smaller diesel vehicles. In addition, a switch of 6 per cent from petrol to diesel cars would occur.

The study suggests the price of fuel, through fuel taxes, has little short-term influence on the type of new vehicles purchased, as would be expected. For example, between May 2007 and May 2008 the average price of petrol in Ireland increased by 7.8 per cent to 1.249 Euros, but estimated CO₂ emissions fell by only 0.3 per cent as a result. In the longer-term, further reductions in CO₂ emissions may occur if higher fuel prices limit the average journey distances.

With consumers encouraged to choose more fuel-efficient vehicles, revenues from both ACT and VRT will be lower: a loss of 181 million Euros from VRT, 7 million Euros from ACT and a fuel tax loss of 3 million Euros. However, the reduction in CO₂ emissions would contribute to Ireland’s Kyoto obligations. The study suggests that a reduction of 0.16 million tonnes (Mt) in CO₂ emissions from transport would fulfill 32 per cent of Ireland’s national commitment to reduce 0.5 Mt of carbon by 2012. In addition, there could be improvements to public health: the study suggests that cutting vehicle CO₂ emissions can also reduces other harmful exhaust emissions. However, the researchers suggest the size of this benefit and the effect of greater NOₓ emissions from more diesel vehicles needs further investigation.

The researchers suggest that further modifications to the ACT and VRT tax systems could reduce the shortfall of tax revenues and optimise CO₂ emission reductions. If even higher taxes were placed on larger vehicles that produce more CO₂ emissions, predicted losses in tax revenues could fall by 64 per cent from 191 million Euros to 65 million Euros. This would result in a further reduction of CO₂ emissions (from 0.16 Mt to 0.23 Mt of CO₂).


Contact: amcnabol@tcd.ie

Theme(s): Climate change and energy, Sustainable mobility