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**NEW CAR FUEL ECONOMY OF GASOLINE AND DIESEL IN THE UK:
1977-2003**

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Improved fuel economy of new cars is key to achieve CO₂ targets of the UK. To achieve such targets the UK has adopted the EU voluntary agreement on CO₂ emissions per kilometre with car manufacturers. In the UK, despite the enforcement of voluntary agreement and improved new car fuel economy, energy demand of private vehicles is 3% higher in 2004 than in 1995. This paper analyses time-series data for the UK to try to disentangle these different effects on fuel economy of gasoline and diesel cars, in order to inform debate on the combination of measures needed to reduce CO₂ emissions from UK road transport. In this paper we model new car fuel economy of private vehicles using a set of cointegrated equations. We estimate by an error correction model (Engle and Granger, 1987) the demand for fuel economy along with price and income elasticity of fuel economy in 1977-2004. We use data of the United Kingdom economy to examine (1) fuel price and income elasticities demand for fuel economy; and (2) to assess the effectiveness of EU voluntary agreement in 1998. We regress the change in fuel economy (litres per 100 km) for new cars against the change in fuel price, in personal income and in regulatory standards of fuel economy. Our model incorporates short run and long run effects on new car fuel economy for 1977-2004. We find that new car fuel economy improvements were largely induced by gasoline price and much less by standards. The model shows that short run price and income elasticities are larger than long run elasticities. However, diesel car equations show lower price and income elasticities. For both fuel types (gasoline and diesel) long run price changes improve fuel economy. Fuel economy is inelastic to price and income for both fuels. The econometric evidence shows that demand for fuel economy (gasoline) is price inelastic (-.40) and indicates that fuel price is more effective in inducing fuel economy improvements than the voluntary agreement. The evidence points that price and income responses of fuel economy have changed in the period.

The vehicles manufacturers intend to meet the standards by increasing the market share of higher fuel economy diesel vehicles. Our diesel equations show that higher incomes increase diesel fuel intensity worsening fuel economy, offsetting the benefit of diesel cars. As consumers increase their incomes they shift into large diesel vehicles. The model can point directions to improve policy on (1) effectiveness of standards on fuel economy changes; on (2) effectiveness of gasoline price to spur fuel economy improvements hence realizing demand reduction, and on (3) effects of disposable income on purchases of fuel economy over several decades. It is also found that it will be increasingly difficult for the UK to achieve the fuel economy targets imposed on vehicle manufacturers by the European Commission in 1998.

References:

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