

# ***AN EMPIRICAL ASSESSEMENT OF THE EFFECTIVENESS OF GREEN POLICIES***

Julian Dieler, ifo Institute for Economic Research, +49/89/9224-1346, dieler@ifo.de  
Darko Jus, Center for Economic Studies (University of Munich), +49/89/2180-3104, darko.jus@lrz.uni-muenchen.de  
Markus Zimmer, ifo Institute for Economic Research, +49/89/9224-1260, zimmer@ifo.de

## **Overview**

The ongoing debate about the most effective and applicable policy instrument to reduce carbon emissions and thereby the speed of global warming deserves empirical examination. With carbon/fossil energy taxes and subsidies to renewables we analyze two of the most prominent measures regarding their ability to reduce the demand for oil products.

Our empirical analysis covers 35 countries for the years 1965-2010. We make two major contributions to the existing literature on estimating oil demand functions: First, we identify the effect of green policy measures on the demand for oil. This was not yet done in any empirical study in this comprehensive way. Second, we disentangle the effects of direct taxes on oil products and of the taxation of complementary goods and services.

## **Methods**

We follow the empirical strategy of Davis and Kilian (2011) who compare different econometric methods and argue in favor of an instrumental variable approach for estimating the effect of a gasoline tax on carbon emissions in the United States. Similarly we estimate tax elasticities of oil demand for our multi-country sample. Thereby our approach differs from other studies which estimate the price elasticities only.

First we estimate single equations for all 35 countries with log differences. Being aware of omitted factors which drive the quantities consumed and lead to biased estimates we pass on to a panel approach with time-fixed effects. As the panel estimation accounts only partly for the price endogeneity in estimating the elasticity of demand we instrument the price of the oil products by the changes in the respective taxes.

## **Results**

Both for the direct taxation of oil products and for the taxation of complementary goods and services the argument of a pigouvian tax can be supported. As expected the taxes on complementary goods and services are less effective than those which are imposed directly on oil products. Beyond that we find that the influence of taxes and subsidies differ substantially between the analyzed countries.

## **Conclusions**

Our analysis emphasizes that green policy measures are increasingly used in many countries. Usually they are justified by the idea to reduce climate change. Our paper contributes to answering the question of how well this aim is being achieved and to which extent carbon taxes simply raise revenues.

## References

Davis, L., L. Kilian (2011), "Estimating the effect of a gasoline tax on carbon emissions", *Journal of Applied Econometrics* (26), pp. 1187-1214

Hughes, J.E., C.R. Knittel, D. Sperling (2008), "Evidence of a shift in the short-run price elasticity of gasoline demand", *The Energy Journal* (29), pp. 93-114

Cooper, J.C.B (2003), "Price elasticity of demand for crude oil: estimates for 23 countries", *OPEC Review*, March 2003