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ESTIMATING THE EFFECTS OF ROAD TRANSPORTATION ON ENVIRONMENTAL QUALITY

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Abstract

This paper analyses the impact of road transportation on emissions of three toxic air pollutants, namely carbon monoxide (CO), nitrogen oxides (NO_x) and volatile organic compounds (VOC), in selected OECD countries for the years 1995-2005. The theoretical framework stems from the Pressure-State-Response (P-S-R) model introduced by the OECD, which served as a tool both for modelling the relationship to be studied and for defining comparable indicators to be used in a cross-section time-series setting. The classic P-S-R model was extended and arranged in an original way in order to include the role of transport as well as the effects of economic performance and social progress variables. Hence, among the determinants of air quality not only the pressures exerted by transport infrastructures and vehicle fleet were considered but also indicators of income level, income inequality, health conditions and urbanization. Moreover the ratification of international treaties for the emissions reduction was taken as an indicator of the response by a country to the demand for environmental protection and safety. In the framework of models for panel data, a Hausman-Taylor model was estimated where the unobserved, time-constant and country-specific term was assumed to account for a sort of environmental awareness.

Key words: air quality, Hausman-Taylor model, panel data, Pressure-State-Response model, road transportation

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