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Ex-post analysis of impacts of the car registration fee in the Czech Republic

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ABSTRACT

Currently, the influence of transportation and its impact on environmental indicators throughout the world are increasing; however, governments of particular countries try to implement new economic instruments with the expectations of changing people's behaviour or at least environmental parameters of the motor vehicle fleet. The Government of the Czech Republic introduced a new economic instrument, which came into force on 1 January 2009 and was inspired by similar environmental taxes in Member States of the European Union – the car registration fee, which is based on emission parameters of cars. The main target of this fee has been to change the structure of the passenger car fleet in the Czech Republic, particularly to support new registrations of new passenger cars with better environmental characteristics and to decrease the share of new registrations of used passenger cars. This article focuses on an ex-post analysis of impacts of the car registration fee on the structure of the passenger car fleet in the Czech Republic and its environmental characteristics in the first 3 years after the legal mandate of the fee. The case study is based on a correlation analysis and an analysis of statistical data from official sources in the Czech Republic. The impacts of the car registration fee on both the structure of the passenger car fleet in the Czech Republic and the environmental characteristics of new registrations are significant. For the first time since 2004, the number of new registrations of new cars was higher in the period 2009–2011 than the number of new registrations of used cars. Moreover, the share of alternative fuel cars in the passenger car market is increasing and the emissions from private car transport are decreasing.

1. Introduction

Ex-post analyses related to environmental taxation focus on impacts of particular taxes on environmental characteristics, mainly changes in corresponding pollution (Baranzini et al., 2000; Bosquet, 2000; Rogan et al., 2011; Sahlin et al., 2007; Vehmas et al., 1999), impacts of taxes on production and consumption indicators (Baranzini et al., 2000; Bardazzi et al., 2004; Bosquet, 2000; European Commission Directorate, 2004; Vehmas et al., 1999), impacts of taxes on distributional characteristics (Baranzini et al., 2000; Bork, 2006; Rajah and Smith, 1993; Roberts et al., 1999; Vehmas et al., 1999; Wier et al., 2005) and impacts of taxes on competitiveness (Andersen, 2007; Ekins, 2007; Speck, 2007). Some economists focus on analyzing all possible impacts of environmental taxes, for example Bach (Bach et al., 2002). Regarding the transport sector, the most interesting are impacts on environmental characteristics; on the other hand, it is usually very hard to obtain sufficient data. For example Baranzini and Vehmas (Baranzini et al., 2000; Vehmas et al., 1999) present ex-post analyses dealing with impacts of carbon taxes in the Nordic countries on decreasing CO_2 emissions; the data are obtained from official sources in the Nordic countries and the EEA. Bosquet (2000) presents an ex-post analysis of the impacts of an environmental tax reform on CO_2 emissions in eight countries, including emissions from the transport sector; the data are collected from 59

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different studies dealing with impacts of environmental tax reform. Rogan et al. (2011) presents the impacts of car emission taxation policy in Ireland on purchasing trends by emission band, fuel type and engine size and quantifies CO_2 emission savings, including data from official statistics in Ireland, the EU and the ACEA.

In the Czech Republic, analyses dealing with environmental taxation have focused mainly on proposals by the Ministry of the Environment regarding an introduction of an environmental tax reform (Pavel and Vitek, 2008; Sauer and Vojacek, 2009; Sauer et al., 2008, 2011), implementation and impacts of Directive 2003/96/EC (Scasny and Bruha, 2007; Sauer and Vojacek, 2009; Zimmermannova, 2009), and tax change proposals designed by the Government (Scasny et al., 2009). There have been no ex-post analyses of impacts of environmental taxation in the transport sector in the Czech Republic; therefore, one should be made after the introduction of the car registration fee.

Regarding the observed studies, a broad range of methods is frequently used for analyzing impacts of environmental taxation. The final selection of the methodology depends on particular result requirements (Kriström, 2006). As presented by the OECD (2006), in practice, environmentally related taxes are seldom used in complete isolation. It should be mentioned before a detailed investigation.

2. Material and methods

2.1. Policy objectives and the car registration fee

Generally, the regulation of the transport area in the Czech Republic consists of technical standards (Hromadko et al., 2010), and legislative and economic instruments (OECD, 2012). In the period 2008–2009, the Czech Government, including members of the Green Party, introduced both changes to existing tools and new instruments aimed at mitigating CO_2 emissions and other pollutants. Because of the limited scope of the paper, we will not go into a more detailed description of the particular instruments with the exception of the car registration fee with environmental parameters. Regarding the other economic instruments, the Czech Republic updates details in the OECD/EEA database on instruments used in environmental policy (OECD, 2012) every year.

The main purpose of the "environmental" car registration fee[1] is to discourage people from buying old, used and the most polluting passenger cars.[2] The fee is paid with the first registration of the vehicle in the Czech Republic. If the vehicle is already registered in the Czech Republic, the fee is paid with the first re-registration after 1 January 2009.[3] The fee applies to all passenger cars and is valid from 1 January 2009.

The rates of the car registration fee, depending on the environmental parameters, are as follows:[4]

- CZK 3000 (EUR 122[5]) – meeting the EURO 2 emission limit;
- CZK 5000 (EUR 203) – meeting the EURO 1 emission limit,
- CZK 10,000 (EUR 406) – meeting no EURO emission limit.

Vehicles that meet at least EURO 3 emission limits are exempted from the obligation to pay the fee. Administration of the car registration fee is carried out on two levels. Regional registry offices carry out the agenda associated with determination and collection of charges while the final collection and utilization of the revenues is entrusted to the State Environmental Fund of the Czech Republic. The fund administrates a so-called "Car wreck disposal program". The revenues from the fee serve the support of collection, processing, utilization and disposal of car wrecks.

2.2. Data and methods

The main data source used to identify the impact of the car registration fee on the structure of the passenger car fleet in the Czech Republic is the Car Importers' Association Statistics (CIAS, 2012), which is administrated for the Ministry of Transport of the Czech Republic, and the statistics published by the Czech Statistical Office (CSO, 2012). Complete statistics on vehicle registrations are available for the period 2004–2011; however, both the statistics of used and scrapped cars are available only for the period 2007–2011 (complete year statistics).

The highest rate of the car registration fee (CZK 10,000/EUR 406) is considered for the purposes of the correlation analysis.

Regarding methods, the correlation analysis is used with the help of the Pearson's correlation coefficient:

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

[1] There is also a basic car registration fee, which is paid with every registration of a car in the Czech Republic. This basic fee is obligatory for all car owners and has no connection with the "environmental" car registration fee.

[2] The main purpose of the car registration fee is declared in the introduction by the Ministry of the Environment of the Czech Republic to Act no. 185/2001 Coll., on waste, as amended by Act no. 383/2008 Coll.

[3] That means with the first change of ownership.

[4] Act no. 185/2001 Coll., on waste, as amended by Act no. 383/2008 Coll.

[5] www.cnb.cz – Central Bank exchange rate, 4 April 2012, 1 EUR = 24.6 CZK.