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An assessment upon the environmental policy in Romania

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The global issues related to greenhouse emissions put pressure on decision-makers to include the environment in their priorities. Decision-makers around the world seek to assess their nation's ecological footprint and discover methods to improve it. Governments must find ways to achieve the national targets and improve environment quality. It is widely known that one of the major polluting sources today is the urban agglomeration of vehicles. This is the main reason for European policies regarding the renewal of a national automotive fleet and taxation per emissions volume.

Our study assesses whether there is any significant correlation between the Junk programme's direct effects (volume of scrapping) and the measure of national vehicles fleet renewal, and if so we wish to deploy a general model describing the correlation. If the evaluation results show no significant correlation we may assume there are public policy flaws to be investigated in future research. Also we bear in mind the indirect but affirmed target: environmental health improvement – the reduction of greenhouse emissions. Given the fact there are only a few studies regarding the Romanian case, the research may constitute a basis for future developments.

Keywords: environmental policy; fiscal policy; public policy; pollution; greenhouse emissions; scrapping

JEL classification: E01; H23; Q58

1. Introduction

As many studies confirm (Fischer & Heutel, 2013; Fischer & Springborn, 2011) there is an evident correlation between environmental policy and economic development. The public approach to one or other environmental issue determines changes in macroeconomic indicators and economic growth fluctuations. Some authors, like Angelopoulos, Economides, and Philippopoulos (2010), even compare the performance of different environmental policy options. In such performance-based models the emissions are considered a byproduct of production by decision-makers who engage in pollution abatement activity and try to find optimal taxation (Angelopoulos, Economides, & Philippopoulos, 2013). At the same time it is important for us to understand the implications of environmental policy thinking that in given conditions of price rigidities, may generate more macroeconomic volatility (Annicchiarico & Di Dio, 2015). In such conditions and having an economic crisis in the background, it is critical for an emerging economy to fully understand and be able to model the environmental policy options at hand.

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We investigate the significance of two correlations. One includes cars older than 10 years and the number of vehicles scrapped. The second connects the number of scrapped vehicles and the carbon dioxide emissions. If the correlation coefficients are significant we deploy the two models trying to set a basis for future researches on the public environmental policy impact upon the environmental indicators. Our aim is to identify if the two correlations are valid and significant for future research. We consider that vehicles 10 years or older are highly polluting, being mainly equipped with non-euro or ancient EU1 or EU2 standard engines. The ‘Junk programme’ is a government environmental policy tool designed to offer vouchers (the nominal value of the voucher is €700) for every old environmentally harmful scrapped, the voucher is to be used towards the purchase of a new vehicle. The main condition for a car to be eligible for scrapping is that it is a minimum of 10 years of age. Another important aspect is that the car is still in working order so that it is still contributing to CO₂ emissions by being registered and still in use. For each new car acquired the customer may use up to three vouchers so the total subsidy for a new car is a maximum of €2,100.

The number of cars 10 years and older (those discussed as having a significant negative impact on the environment) is influenced in many ways. One factor is the national fleet natural ageing, another is the importing of used cars (older than 10 years) from foreign markets. On the other side are national programmes, driven by public funds, for phasing out of these cars. We consider the natural outlet of the movement of such vehicles. This component is considered a negligible volume compared with other elements.

Being funded from the public environment budget the scrapping programme aims primarily to cleanse the national fleet of heavily polluting vehicles and thus ultimately reducing greenhouse emissions in the territory of Romania.

At a time of fiscal measures, doubling the first registration tax for old cars entering the country could have the desired effect. The policy mix (incentives for ‘junk’ removal and subsidies for new car acquisition; inhibiting the import of used cars) had its flaws. Due to inconsistent tax measures (regarding the importing of old cars from outside the country), challenged and amended on many occasions, the import of old cars continued and may cancel the positive effects of ‘junk’ removal from the national automotive fleet.

Our objective is to demonstrate whether the scrapping programme has any impact at all upon environment quality and to launch the premise for future research, including the fiscal incentives as variables in determining the proper policy.

The novelty of our article consists in the fact that the government Junk Programme was not yet the object of any assessment. We also consider that discovering if the correlations we propose are valid or not may be the basis for future research, using our findings as starting point.

2. The public environmental policy in review

Generally the sets of policies and instruments available for decision-makers are persuasive, cooperative, economic (or market-based), procedural and regulatory (Böcher & Töller, 2003, 2007; Böcher, 2012; Howlett & Ramesh, 1995; Schmitt & Schulze, 2011; Pesqueux, 2009). Also the public policy can maximise its non-profit focus and set very generous objectives regardless of costs if the public demand asks it (Ramos, Alves, Subtil, & Melo, 2007). Moreover an environmental public policy is not made for

addressing economic development objectives or for the individual interest of some private enterprises.

It is obvious in the last decade that the classical approach of public controlling of the environmental issues is not fully addressing the environmental degradation speed and the complex implications upon human life and economic growth. New public policy tools such as environmental taxes, subsidies and other market-based measures came forward to fulfil government empowerment (Sterner, 2012).

The sensitivity of the environmental problems is amplified in some cases by the corruption and tax morality levels. According to recent findings (Harring, 2014), especially for emerging countries such as Romania, corruption issues can make it very hard to assess the environmental policy measures or even identify whether they are properly used (Aghion, Algan, Cahuc, & Schleifer, 2010).

The simplest approach of the pollution matter is the Pigou principle which states that the polluter must pay for his negative environmental impact (Pigou, 1920). In time the economic activity diversification and the complexity of environmental issues called for new approaches and new interpretations for the public decision-makers. Moreover the simple payment for pollution did not solve the increasing and constant depletion of environmental resources. In time, pollution became something you have to pay for with some of your profits, like any other service or merchandise. It was simply another cost you had to account for in your production.

Time has proved that the one-dimensional approach toward environmental matters is insufficient and combinations of instruments and policies are more suitable for such complex issue as the protection of the environment (Böcher, 2012). For example the environmental taxation moved forward from only 'punishing' the bad to use the revenues for reducing the taxation of the 'good' (income tax or social security contributions) (Ekins, Summerton, Thoung, & Lee, 2011; Ekins & Barker, 2001; Ciegis, 2008). The double dividend hypothesis in the environmental taxation matter is not seen as a general theory, and some studies proved that in some cases the revenues from environmental taxation had beneficial side effects upon other fields (for example employment) (Capros, 1996; Fullerton & Metcalf, 1997; Grubb, Edmonds, ten Brink, & Morrison, 1993; Kumbaroglu, 2003), even in the short-term only (Bontems & Bourgeon, 2005; Carraro, Galeotti, & Gallo, 1996). The environmental taxation could be effective for economic growth (Bovenberg & de Mooij, 1997; Ekins et al., 2011) by even stimulating research and development activities (Nakada, 2004). But there were situations when nothing happened or even worse, there was unemployment and bad economic side effects (Fullerton & Metcalf, 1997). The crowding out effect in terms of private expenditures (Haung & Cai, 1994; Itaya, 2008; Lighthart & van der Ploeg, 1994) is seen as the main argument for not using a simple environmental policy based on hyper fiscal measures.

Although we accept that the environmental policies (including taxation as a major regulating tool) may spread its beneficial effects upon not only environmental welfare, the main benefit is keeping the environment damages and pollution at lowest levels as possible. We consider the environmental welfare as being the sum of all natural resources (water, wildlife, etc.) and environmental conditions (mainly related to public health such as the air) unaffected by the human activity. The CO₂ emissions are one of the most prevalent air contaminants and are associated with urban agglomerations and combustion engines (Wu, Zhang, Xu, & Zhu, 2011). The Kyoto protocol established limits and the automotive industry developed new standards trying to diminish the pollution. Today cars are less harmful than the old ones

(those aged 10 years or older). The national governments try to renew their automotive fleet and grant subsidies and different kind of incentives for new acquisition (less the pollutant the bigger the incentive) and encourage the cars owners to give up their old vehicles.

The approach tends to redirect the old automobiles (non-Euro, Euro 1, 2, 3, mostly older than 10 years) to emerging countries such as Romania, where purchasing power influences the consumer to buy second-hand cars. Given these facts we try to establish if the JUNK Programme achieved its targets and lessened greenhouse emissions (ANMP, 2012).

The government programme's beneficial effect upon the environment quality was contested by a vast number of specialised NGOs. The same NGOs also affirm that the poor substantiation of the programme's objectives and future developments was one of the causes. Moreover the shortage of research studies and non-governmental reports and analysis determines the poor understanding and explanation of the public policy choices in this matter. This shortage is why we developed a study based on scarce fragmented public data and almost no other research approaches the programme effects.

3. The modelling

The explanation for choosing cars older than 10 years for our assessment is that most of them are in the non-Euro, Euro 1, 2 and 3 family. It is known that the last models provided by the automotive industry (Euro 4 and 5) are less harmful to the environment than the older ones. The government programme, entitled 'JUNK', explicitly set as the main target the scrapping of cars produced more than 10 years ago.

We chose the CO₂ emissions to describe the environmental damage in our study. It is directly connected to the automotive way of transportation and was named as the main reason for global warming (European Environment Agency [EEA], 2008; Intergovernmental Panel on Climate Change [IPCC], 2007; United Nations [UN], 1998). It also represents more than 75% of the anthropogenic greenhouse gas emissions (Intergovernmental Panel on Climate Change [IPCC], 2007).

We test the correlation coefficient by trying to explain the correlation between the chosen public environmental policies: the first determines the efficiency of the JUNK Programme by the correlation between the number of 'junks' and the scrapping volume; the second puts into context the scrapping volume and the carbon dioxide emissions.

3.1. The correlation coefficient assessment – testing the relation between 'junks' and scrapping volume

The premise is that the number of national automotive 'junks' is influenced by the scrapping volume. Given the natural ageing speed of the national fleet and no external entrance of 'junks' the scrapping should directly influence the fleet renewal. We also know that the fiscal measures (the first registration tax) inhibit the import of 'junks' and should maintain a neutral impact of external imports.

In the first stage of our assessment we describe the correlation model between the scrapping volume as an independent variable and the total number of vehicles older than 10 years in the national automotive fleet.

Table 1. Testing the correlation between numbers of cars over 10-years-old and scrapping volume.

No.crt	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.437 ^a	.191	.029	3.78799E5

Note: ^aPredictors: (Constant), Scropp_vol; b. Dependent Variable: cars_over_10y.
Source: Own calculations.

The correlation coefficient (R) shows a connection between the two variables (Table 1).

Given the value of Sig the assumption that the number of national automotive 'junks' is influenced by the scrapping volume is correct. The volume of scrapping should directly influence the structure of the national automotive fleet in terms of how old it is.

The evolution of 'junk' scrapping as a result of the governmental programme does not explain the trend of cars older than 10 years in Romania, given the influence of other decisive factors as the incoherence of the fiscal instruments and in this context the growing imports of old cars. These two factors' (the fiscal incoherence and the second-hand automobile import) effects are stronger than the beneficial effects of the scrapping programme. This is obvious from when we are assessing the evolution for the 2007–2012 (the first registration tax – a tax meant to inhibit second-hand imports – was first implemented in 2007 and suffered different modifications due to the risk of an 'infringement' procedure from the EC). From 2007 the number of registered vehicles older than 10 years grew constantly from 1.6 million to approximately 2.4 million in 2012. Moreover if in 2009 the cars 10 years or older made up 33% of the total, in 2012 they reached approximately 55%. This was accompanied by the increase of the average age of the national automotive stock from 10 to 12 years. At the same time the EU average age was eight years.

As the correlation coefficient is statistically relevant (Sig<0.05) we can deploy the model as follows (Table 2):

Table 2. Testing the correlation between number of cars over 10-years-old and scrapping volume – model coefficients.

Model variables	Unstandardised Coefficients		Standardised Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	1389088752	192446367		7,218	.001
Scropp_vol	2,642	2,431	.437	1,087	.0032

Note: Dependent Variable: cars_over_10y.
Source: Own calculations.

$$Y = 2,642X + 1,389,088,752 \quad (1)$$

3.2. The correlation coefficient assessment – testing the relation between the volume of scrapping and the carbon dioxide emissions

From our point of view it is obvious that the final objective of public environmental policy is to eliminate highly polluting vehicles. Moreover the premises for implementing

such a policy is because studies show that ‘junks’ are a bad influence upon air quality and the volume of green emissions. Logically we cannot discuss of a public policy developed without any impact study or target setting. As a result of this assumption the environmental public policy is a success if the environmental improvement targets are achieved. If not, we are talking about failure.

The second model describes the correlation between the volume of scrapping (independent variable) and the carbon dioxide emissions (independent variable) (Table 3).

Table 3. Testing the correlation between CO2 emissions and scrapping volume.

No crt.	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.221 ^a	.049	-.142	992,06870

Note: ^aPredictors: (Constant), Scrapp_vol; b. Dependent Variable: co2_emission.
Source: Own calculations.

Again even the two variables would seem very connected we find that because of the limits of the public policy (failure of taxation for affecting activities – imports of old cars), the model shows the connection is insignificant. In other words even the volume of scrapping has a positive trend the carbon dioxide emissions keep constant. The fact could be the cause of the imports of ‘junks’ that keep the pace with the scrapping of ‘junks’. In the 2008–2012 period the vehicle imports of 10 years and older were constant, even growing in 2012 (by about 75,000 vehicles) and 2013 due to the new first registration tax (smaller tax for older cars). In the same period the report between new car registration and second-hand registration changed from 2.5 new cars registered for each second-hand one to 0.4 new cars for each second-hand car. So the positive effect in eliminating old heavily polluting automotives is levelled by the volume of ‘junk’ imports in the same period and the inability of the first registration tax to inhibit ‘junk’ imports.

The model cannot be deployed as the correlation coefficient shows no significant relation between the two variables (Sig>0.05) (Table 4).

Table 4. Testing the correlation between CO2 emissions and scrapping volume – model coefficients.

Model		Unstandardised Coefficients		Standardised Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	12942,904	504,014		25,680	.000
	Scrapp_vol	.003	.006	.221	.506	.634

Note: Dependent Variable: co2_emission.
Source: Own calculations.

Conclusion

The government has a good initiative when offering subsidies for new car acquisition but they fail to empower this active measure by taxing the ‘bad’ behaviour (importing old and highly polluting cars).

If the public policy implemented for environmental protection was set to achieve environmental targets the only conclusion if the targets are not achieved is that it has failed.

This failure to connect the two measures – encouraging the renewal of the national transportation fleet with penalising the bad behaviour of importing ‘junks’ – levels the benefits of the JUNK Programme. First the decision-makers described the programme as an economic incentive for the domestic car industry. We also show that when decision-makers fail to explain and popularise a good decision public policy turns against the government and instead of benefits can bring losses for all the actors.

We also can propose another assessment for future research including the fiscal benefits of the environmental measures and the actual environmental benefits. We wish to verify, for the case of Romania, if the beneficial effects are spreading or only manifest upon the environmental figures.

Furthermore our study may be the basis for further assessments upon the state of environmental policy tools option in Romania and other similar countries. We seek to evaluate whether the environmental policy can be modernised in Romania based on its current performance.

As a policy recommendation we suggest that taxation and subsidies’ predictability is critical in terms of environmental policy. The unstable climate regarding the environmental policy and public policy as a whole cannot bring sustainable positive effects, but only random changes in terms of environmental performance at national level. The random effects may be a result of economic crises, demographic changes or socio-economic developments. A better planning of environmental tasks and targets by which to achieve them is desirable for creating environmentally-friendly behaviour among agents.

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