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THE ECOLOGICAL COMPONENT OF TRANSPORT VEHICLE TAX – A STEP TO THE GREEN REFORM IN THE REPUBLIC OF BULGARIA

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Abstract

The latest amendments of the Local Taxes and Fees Act (LTFA) in force since the beginning of 2019 have been voted difficultly because of the public dissatisfaction with the change in the transport vehicle tax. For the first time, the conceptual basis of the tax has been added with an environmental component. It takes into an account of the compliance of the cars with Euro standards for exhaust gases. These amendments reduce the tax burden for the owners of new vehicles that meet current requirements and increase it for those who do not have the relevant environmental category.

The current research proves that most European countries apply different taxes based on CO₂ emissions. Bulgaria is among the few countries that, prior to the change, did not use similar financial instruments in order to achieve not only fiscal but also other aims in the environmental policy. A number of EU directives regulate exhaust gases standards and these requirements are increasingly tightening. Bulgaria is a part of the EU and it implies harmonization of our tax legislation including the part of the vehicle tax.

Keywords: transport vehicle tax, ecological component, green reform.

INTRODUCTION

When mentioning the word tax the immediate association is solely related to its fiscal significance. It is often forgotten that this is not its only function. In the effective tax policy (Dimova, 2016) the economic, social and environmental functions are not less valuable than the fiscal. According to this, the legislative changes in the part of the transport vehicle tax have been made in the recent months.

For the first time in our tax policy, the environmental component of the tax was added. This enables the direct application of the basic principle in the ecology, namely "the polluter pays". Its imposition not only in the Bulgarian parliament but also among the general public has caused a big dissatisfaction.

The reason is that this change affects the more socially sensitive part of the society. These are lower-income people with older and cheaper cars that do not meet modern standards and pollute more the environment.

The purpose of the current study is to make a comparative analysis of the transport vehicle tax in Bulgaria and the practice of other European countries. The research argues the need to use the taxes as an effective tool in the achieving of the environmental reform goals.

MATERIALS AND METHODS

The development of this study is based on data from Eurostat, the European Environment Agency and European Automobile Manufacturers Association. The applied system includes general logical methods such as methods of induction and deduction, analysis and synthesis, the abstract-logical approach, the historical method, method of comparative analysis.

RESULTS AND DISCUSSION

For the first time in our practice according to the latest change in our legislation transport vehicle tax is subject to the two-component principle, including property and environmental parameter. Thus, the tax for light and commercial vehicles with a technically permissible maximum mass not exceeding 3,5 t is determined by the formula:

$$AAT = PC \times EC \text{ where}$$

AAT is the annual amount of the tax

PC is property coefficient

Ec is ecological component

In its turn the property component includes two aspects: (1) a tax determined on the basis of the power of the engine, which increases progressively with increasing the power; 2) a correction coefficient depending on the year of

production. Both of these aspects have been changed.

The number of the progressive tax floors is increased from 5 to 6, with the first two merging into one. The new one is subject to the lowest tax rates. Two new floors are introduced for the most powerful cars and their rates are significantly increased. The tax increases in jump-like progression, although its rate is not the same in each individual floor. The legislation still keeps the tendency that each municipality can choose between a minimum and maximum rate mentioned in the act and they are in ratio 1:3.

The correction coefficient, depending on the year of production, also undergoes serious changes. The existing three categories of vehicles have been increased to five. Overall, there is some reduction in the coefficients, especially for new cars under 5 years from 2.8 to 2.3. There is no change with the vehicles from 5 to 10 years. These ones from 10 to 15 years are subjected to a reduction because the value of the coefficient becomes 1,5 from 1,3.

A novelty in the correction coefficient is its increase for vehicles older than 20 years. Its value is changed from 1 to 1.1. This tendency is entirely in line with the changes and introduction of the environmental component. According to the policy of the Local Taxes and Fees Act, the more powerful a car is, the higher is its tax ratio. At the same time, the older the vehicle is, the more reduced the coefficient becomes and that does not change the value of the tax. This is how the social aspects of the tax are set and satisfied, and people with lower incomes owning cheaper cars, pay less.

The environmental component in determining transport vehicle tax aims to comply with the polluter pays principle. It requires one who pollutes the environment to a greater extent, to pay more. These are the owners of older cars that do not meet modern environmental standards. The new component is related to the European emission standards for passenger cars. These standards define the acceptable limits for exhaust emissions of new vehicles sold in the European market. The first such standard "Euro 1" is introduced in 1992 for passenger cars and the latest one "Euro 6" dates back to the autumn of 2014. The standards that are relevant for determining the transport vehicle tax in Bulgaria are "Euro 1", "Euro 2", "Euro 3", "Euro 4", "Euro 5", "Euro 6" and "EEV". These standards limit CO₂ emissions and emissions, such as nitrogen oxide NO₂, hydrocarbons HC and particulates matter PM. In 2013, the European Parliament adopts a decision for CO₂ limitation because of its increasing

share in the atmosphere is considered to be the main reason for global warming.

According to the European strategy ultimate goal the vehicles until 2021 will emit less than 100 g CO₂/km. Since the introduction of "Euro 2" in 1996, EU regulations introduce different emission limits for diesel and petrol vehicles. Diesel has more stringent CO₂ emission limits as the initial difference is significant, but after Euro 4 the difference is twice. The trend for NO_x emissions is opposite – diesel is emitting more NO_x, and for Euro 3 this difference is more than three times, while at Euro 6 stage it is insignificant- less than 0.02 g/km. The particulates matter of petrol powered vehicles is not limited and, with the introduction of "Euro 5 and 6", requirements equivalent to those of diesel are introduced for vehicles with direct injection engines.

Thus with the changes in our legislation five major categories of vehicles are set. The ecological coefficient has its highest value for the non-categorized vehicles, "Euro 1" and "Euro 2". Its size may vary from 1.1 to 1.4 according to the decision of the relevant municipal administration. The smallest is the coefficient for vehicles with an ecological category "Euro 6" and "EEV" whose values are between 0.4 and 0.6. For the last three categories of vehicles requiring the Euro 4 standard or higher, the environmental component actually results in a tax reduction as its value is permanently below 1.

Thus, a real increase in the tax burden will be available for the taxpayers with old vehicles. The new amendments dropped the 50% reduction for vehicles with a power no more than 74 kW corresponding to the Euro 3 and Euro 4 and 60% reduction for the Euro 5 and Euro 6 categories. How the tax obligations could be changed before and after the changes in the legislation can be traced to the following table № 1. It compares the tax due on differently selected types of vehicles according to the power and the year of production of the vehicles.

They are selected in a way that allows comparing vehicles from each of the six categories according to their power and from each environmental category according to the year of production. In the calculations, the minimum tax rates are used as a basis for comparison in order to achieve comparability of the results obtained.

Table 1 allows us to summarize several major findings on the individual categories of cars. An increase in the tax (with the red numbers) is observed entirely in the first category of vehicle older than 20 years because the property coefficient has been increased and a new one with a value above 1 has been introduced.

Таблица 1. Change in the tax liabilities in selected categories vehicles

Power in kW	Before amendments					After amendments				
	without ecological category	Euro 3	Euro 4	Euro 5	Euro 6	without ecological category	Euro 3	Euro 4	Euro 5	Euro 6
	>20 years	15-20 years	10-15 years	5-10 years	<5 years	>20 years	15-20 years	10-15 years	5-10 years	<5 years
40	16.00	8.00	12.00	9.60	17.92	16.46	13.60	14.14	12.24	12.51
60	32.40	16.20	24.30	19.40	36.29	39.20	32.40	33.70	29.16	29.81
90	99.00	99.00	148.50	148.50	277.20	119.79	99.00	102.96	89.10	91.08
120	147.60	147.60	221.40	221.40	413.28	178.60	147.60	153.50	132.84	135.79
180	221.40	221.40	332.10	332.10	619.92	348.48	288.00	299.52	259.20	264.96
250	307.50	307.50	461.25	461.25	861.00	635.25	525.00	546.00	472.50	483.00

Source: Own calculations according to the LTFA

The increase in the weak power vehicles is insignificant and amounts to about 3%. More serious is the change in vehicles with power up to 150 kW - 21%. The biggest change can be observed for a really powerful vehicle due to the opening of two new floors that use significantly higher tax rates. In these two categories, the growth is 57% and 107%, respectively.

Owners of vehicles complying with "Euro 3" in the majority of the cases also have increased tax liabilities. The vehicles that are most affected are those ones on the floors at the two opposite ends of the scale. The first group covers the vehicles with a power of up to 74 kW, which lose their 50% discount, and therefore the increase in this group is: 1) 70% for the first floor subject to a lower rate of the property coefficient due to the merger of the first two floors compared to the previous legislation; 2) 100% for the second floor at the same tax rates. The second group covers the vehicles of the last two floors with the most powerful cars. They are taxed with significantly higher tax rates than before. The increase in these two floors is 30% and 71%, respectively. The vehicles at the third and fourth floor remain with unchanged tax liabilities, as the tax rates are equivalent.

Vehicles complying with "Euro 4" standard are the first to acquire a coefficient with a value less than 1 that actually leads to tax relief. However, the changes in this category are not only in the direction of reduction. A reduction in the tax liabilities can be observed indeed with the vehicles at 3rd, 4th and 5th floor with power from 74 to 245 kW. It amounts to approximately 31% for the first two of the above-mentioned floors and to less than 10% for the 3rd due to the impact of the increased tax rate and the imposition of the new trend for a larger property ratio for more powerful vehicles. A

rise in the tax liabilities can be observed with the vehicles complying with the category of Euro 4 despite the reduced coefficient, in two cases: 1) vehicles with a power of up to 74 kW, which have lost their right to a 50% discount. Those less than 55 kW experienced a lesser increase of approximately 18% as they were taxed at a lower rate due to a merging of the two floors. For vehicles ranging from 55 to 74 kW, the increase is approximately 39%; 2) the most powerful vehicles only on the last floor over 245 kW, where the decrease in the property and the ecological coefficient is not enough to compensate for the significantly higher tax rate, the increase being less – 18%.

Vehicles complying with the Euro 5 standard have the same changes to those of the previous category. It makes an impression that in this category the changes are more pronounced in the first two floors due to the lack of the possibility of using a discount of 60%. Therefore, the growth here is 28% and 50% respectively. In the next three floors, the reduction in the tax burden is even higher at 40% and 22% respectively. The rise of the last floor is already insignificant with a value of 2.4%.

The taxpayers with vehicles under 5 years are the most favoured by the new amendments due to the reduced property and ecological coefficient with a value already of 0.4. Here, in all categories of vehicles, there is a reduction reaching 67% in the floors of vehicles with a power of 74 to 245 kW. Despite these different rates of tax increases for the categories of vehicles, it should be borne in mind that, due to its small base, this increase is in the range of a less of 1 to 20 BGN. The higher increase can be observed with vehicles over 150

kW but the reason, as mentioned, is not the ecological but the property coefficient of the tax.

Similar tax reliefs are also provided for: 1) mopeds and motorcycles up to 74 kW, complying with the "Euro 4" standard, which benefits from a 20% tax deduction. Mopeds and motorcycles complying with "Euro 5" and "Euro 6" standards benefit from a 60% discount; 2) for buses, trucks with a maximum mass exceeding 3, 5 tons, trailer tractors and truck tractors complying with Euro 4, the tax should be reduced by 20% and those satisfying "Euro 5", "Euro 6" and "EEV" standards are subject to 50% reduction of the tax due.

Vehicles which do not pollute the environment like electric automobile, motorcycles, mopeds, electric vehicles of categories L5e, L6e and L7e are exempt from tax. The extent to which this measure has a real impact on taxpayers' behaviour can hardly be estimated given the fact that the number of charging points in Bulgaria is the second lowest in the EU-28 (European Commission, 2018). According to the report, there are only 1.7 charging points per 100 000 inhabitants in peripheral urban areas in 2017.

This means that there are a total of 22 publicly available charging points in Bulgaria. In addition, the number of alternative fueled cars is also one of the lowest in Europe with a share of only 0.04%. There are some attempts to promote the use of electric and power-driven hybrid vehicles such as for example within the Climate Investment Program the National Trust EcoFund raises projects under the Electricity Promotion Scheme.

The public administration – the central

administration, its territorial units and municipal administrations – is stimulated to apply for funding for the purchase of a maximum of three electric vehicles.

The existence of such relieves linked to the environmental categories of vehicles is a necessary step towards implementing the reform aimed at reducing CO₂ emissions. Introducing such financial incentives as taxes can really lead to a change in people's behaviour.

There are studies (European Environment Agency, 2018) that prove that, where appropriate financial incentives have been introduced, people are starting to buy new cars with lower CO₂ emissions.

This is one of the main goals of the EU, which aims at a continuous reduction of the emissions of passenger and commercial vehicles. By the end of 2018, the EU has further revised and tightened the rules for introducing stricter CO₂ emission standards for new passenger cars and light commercial vehicles.

The amended rules require new cars to allocate an average of 37.5% less CO₂ compared to the level of 2021, fixed at 95g CO₂/km. This should be promoted together with the creation of special incentives for countries to promote an increased share of zero or low emission vehicles.

The data show the steady trend of continuously reducing CO₂ emissions from new cars in the EU from 170 g CO₂/km in 2001 to 118.5 g CO₂/km in 2017. There are large differences between countries that can be traced to the following figure 1.

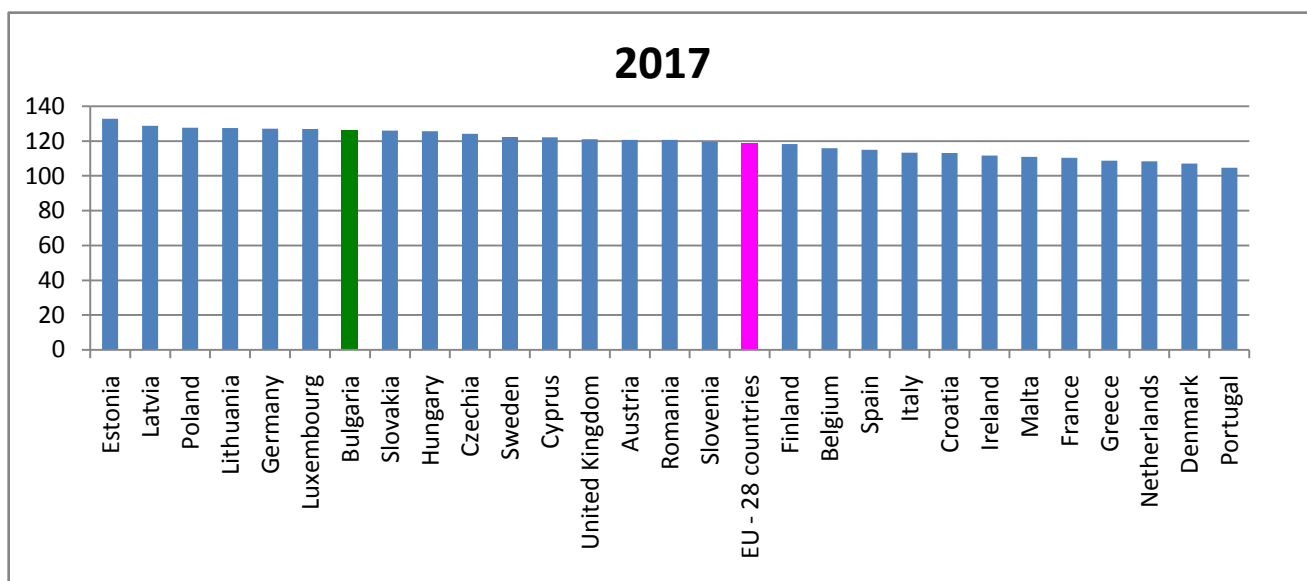


Fig. 1. Average CO₂ emissions per km from new passenger cars in EU-28 (Source: EEA, DGCLIMA)

Table 2. CO₂ based motor vehicle taxes in the EU-28

Country	Tax instruments and incentives
Australia	A deduction of VAT is applicable for zero CO ₂ emission passenger cars The company car tax is also based on CO ₂ emissions Pollution tax is levied on the purchase of a new car
Belgium	Registration tax based on CO ₂ emissions The deductibility under the corporate tax of expenses related to the use of company cars is linked to CO ₂ emissions
Croatia	The first registration of a motor vehicle is subject to the payment of a special tax based on the vehicle's purchase price, CO ₂ emission and fuel type
Bulgaria	none
Czechia	A surcharge is levied in addition to the registration tax for vehicles not complying with at least Euro 3 emission standards
Cyprus	The registration tax and the annual road tax are based on CO ₂ emissions
Denmark	The annual circulation tax ("Green owners tax") is based on fuel consumption for petrol, diesel and biogas cars
Estonia	none
Finland	Registration tax based on CO ₂ emissions
France	CO ₂ based bonus-malus system An additional bonus of €200 is granted when a vehicle of at least 15 years old is scrapped The company car tax is based on CO ₂ emissions.
Germany	The annual circulation tax for cars registered as from 1 July 2009 is based on CO ₂ emissions. Cars with CO ₂ emissions below 95g/km are exempt from the CO ₂ tax component
Greece	The registration tax is based on CO ₂ emissions The annual circulation tax for cars registered after 31 October 2010 is based on CO ₂ emissions. Cars with emissions up to 90g/km are exempt
Hungary	The registration tax is based on environment protection classes in accordance with EU emission standards
Ireland	The registration tax is based on CO ₂ emissions A VAT is deductible for cars registered after 1 January 2009 with CO ₂ emissions lower than 156g/km and which are primarily used for business purposes The annual circulation tax for cars registered since 1 July 2008 is based on CO ₂ emissions
Italy	none
Latvia	For passenger cars registered after 31 December 2009, road traffic tax is calculated by CO ₂ emissions
Lithuania	none
Luxembourg	The annual circulation tax for cars registered after 1 January 2001 is based on CO ₂ emissions and the type of fuel
Malta	The registration tax is based on CO ₂ emissions The annual circulation tax is based on CO ₂ emissions and vehicle's age
Netherlands	The registration tax is based on CO ₂ emissions the rates of road tax (ACT) are established based on CO ₂ emissions, Gross Vehicle Weight, fuel type and region; The company car tax is based on CO ₂ emission
Poland	none
Portugal	The registration tax is based on engine capacity and CO ₂ emissions The annual circulation tax for cars registered after 1 July 2007 is based on CO ₂ emissions and cylinder capacity
Romania	A three - year fleet renewal scheme was launched in May 2017. It includes a scrappage program and incentive bonuses as follows: A scrappage bonus of €1,500 is granted for scrapping a vehicle older than eight years and for the acquisition of a new vehicle with CO ₂ emissions lower than 130 g/km scrappage bonus of €1,500, as well as an Eco - bonus of €250 (total €1,750), are granted for scrapping a vehicle older than eight years and for the acquisition of a new vehicle with CO ₂ emissions lower than 98 g/km. A subvention of €10,000 is granted for the purchase of a new pure electric vehicle A subvention of €4,500 is granted for the purchase of a new hybrid vehicle
Slovakia	Highway fees for the use of specified sections of motorways and expressways are based on Euro emission classes
Slovenia	The registration tax is based on price and CO ₂ emissions
Spain	The registration tax is based on CO ₂ emissions reduction in the payment of the company car tax applies to Euro 6 vehicle emitting less than 120g CO ₂ /km, as well as to alternative power train cars
Sweden	New vehicle registered will receive a bonus up to maximum SEK 60,000 depending on CO ₂ emission The annual circulation tax is based on CO ₂ emissions for both cars and trucks
United Kingdom	The annual circulation tax for cars registered after March 2001 is based on CO ₂ emissions Additionally, the first-year rate of registration applies since 1 April 2010 Alternative fuel cars receive a £10 discount on the paid rates The individual's company car tax liability is set according to the CO ₂ emissions ratings (g/km) of the car and its fuel type

Source: European Automobile Manufacturers Association

Figure 1 allows us to summarize several major conclusions. Portugal is the country with the lowest values in the average CO₂ emissions of 104.7 g/km, followed by Denmark 107.1 g/km, the Netherlands 108.3 g/km and Greece 108.8 g/km. At the opposite end are Estonia 132.8 g/km, Latvia 128.8 g/km, Poland 127.6 g/km and Lithuania 127.4 g/km. Bulgaria with its 126.2 g/km ranks seventh among EU member states. Most European countries apply different tax incentives and incentives to stimulate purchases of lower-carbon vehicles (European Automobile Manufacturers Association, 2018). Only five of those countries, namely Bulgaria (before the amendment in 2019), Estonia, Italy, Lithuania and Poland, are exempt from applying such incentives. These conclusions can be traced in Table 2 given above. We may see that almost all European countries are applying taxes that are determined according to the CO₂ emissions of the vehicles. Some of them are related to one-off payments at the time of the initial registration of the vehicle and the other to annual base. Bulgaria is among the few countries with high values of the indicator (DG Environment, 2019), where before the amendments at the beginning of 2019, the vehicles are not subject to tax related to CO₂ emissions.

CONCLUSIONS

1. Taxes are an effective and powerful instrument for implementing the government's strategic goals, including in the environmental policy. Bulgaria did not use similar financial mechanisms until the beginning of 2019 in order to change the behaviour of the taxpayer in accordance with the environment protection.

2. The new amendments were hardly voted by the National Assembly because of the serious public protest. In fact, they are a particularly necessary step towards the implementation of the green reform, which is so necessary not only for our country.

3. The change of our legislation and the introduction of the environmental component mainly affect the taxpayer-owners of older vehicles that do not have an environmental category or comply with the Euro 3 standard. Due to the low values of their tax liabilities, the increase, measured in absolute terms, is insignificant.

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