ELIT
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Montenegrin Journal of Economics

Csikosova, A., Culkova, K., Janoskova, M., Mokrisova, V. (2021), "Evaluation of Environmental Taxes Influence to the Business Environment", *Montenegrin Journal of Economics*, Vol. 17, No. 3, pp. 31-40.

Evaluation of Environmental Taxes Influence to the Business Environment

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ARTICLE INFO

Received October 20, 2020
Revised from November 22, 2020
Accepted December 18, 2020
Available online September 15, 2021

JEL classification: E62, G38, H20, K32

DOI: 10.14254/1800-5845/2021.17-3.3

Keywords:

Environmental taxes,
living environment protection,
vusiness environment,
Visegrad group.

ABSTRACT

Purpose: Environmental taxes present important indirect economic tool for achieving of environmental goals in the sense of environmental burden decreasing. The importance to deal with environmental taxes is connected also with European directives for waste management, reuse and recycling, energy recovery. The goal of the contribution is to analyse position and importance of environmental taxes establishment in Visegrad region. Methodology: To achieve determined goal, there was made analysis of environmental taxes in tax system of Slovakia, development of tax rates and collection of environmental taxes. Approach: Research of development and evaluation of environmental taxes had been done according to the newest available data from databases Eurostat, OECD, Ministries of individual Visegrad region countries, and Customs and Taxes Administrations of individual Visegrad region countries. Findings: Results of the contribution prove influence of the environmental tax introduction to the tax system and primary impact to the business behaviour with orientation to the eco-innovation processes. The further problems of environmental taxes evaluation should be orientated to the systematic tool for solving of environmental policy not only at the national, but also at the multinational level.

INTRODUCTION

Environmental policy and protection of living environment, orientated to the environmental burden decreasing becomes actual worldwide problem and part of national and multinational economic policies. Environmental taxes present important indirect economic tool for achieving of environmental goals in the sense of environmental burden decreasing. There are mainly indirect taxes with character of consumption taxes with afford to limit negative externalities, with acceptance of principles of revenue neutrality, relating to the economic subjects, sectors of national economy in area of impact to the cost decreasing,

technological changes, competitiveness, payment ability, etc. Except of fiscal and stimulation effect they have important impact to the establishment of eco-innovation activities and processes of business environment subjects.

1. LITERATURE REVIEW

Environmental or ecological taxes belong between indirect tools of environmental policy, orientated to the protection of living environment, which influence effectiveness of sources using and economic growth, employment and price level. The use of environmental taxes and charges in OECD countries increased by 50% between 1987 and 1994. The idea of this taxes in expert literature uses also naming as environmental, or energetic taxes (Casal, 2012), as it results from the Decree No 2003/96/ES, which in EU determines minimal tax rates for energetic products. By influence of harmonization and approximation processes, the idea had been moved also to the areas of ecological taxation. From the view of international space and from the view of influence to the living environment, number of authors (Ekins & Speck, 2011) is leaning to the idea as „environmental taxes".

However, in theoretic area we must regard general definition of taxes as obligatory, determined by law, not equivalent, commonly repeated payment, which tax subjects pay to the state in determined level and determined term. From this quantification there results definition of environmental taxes according to Gao et al. (2019), which mentions that these taxes have character of political tools, which assume economic and environmental efficiency (Tang et al., 2017), rarity of sources, carrying capacity of business sphere and inhabitants burden, as well as loading of polluters and internationalization of negative externalities. Pigou (2017) pointed as first to the consequences of negative externalities during definition of environmental taxes in his researches, when developed definition of environmental tax to the theory of wealth economy with emphasize to the ineffectiveness of sources allocation and costs, which rise due to the living environment pollution (Pintaric et al., 2019). Negative externality is defined as effect that rises in case when production or consumption of the one subject causes involuntary costs to other subjects (Gerlagh & Lise, 2005; Lin & Li, 2011). Economic subject does not share its all costs, caused by production or consumption, which are not included to the products prices, while there is market ineffectiveness and therefore there is necessary to impose a tax to such externalities, which are in expert literature defined as Pigou emission tax (Pigou, 2017). Pigou tax strictly reflects theory of externalities and is based directly on the pollution unit, mainly carbon dioxide sulfur dioxide - CO_2 and SO_2. Pigou confirmed that state intervention to the economy is necessary tool for solving of such externalities.

Spassova and Garello (2010), resulting from these theories speak that the state intervention by the way of environmental taxes and fees would enable decreasing of transaction costs and express common costs of production. With assumption of racial behavior of producers, Pigou suggested emission tax is effective economic tool of environmental policy. This emission tax has its positives as well as negatives. Pigou in his considerations about emission tax did not count with dynamic economic growth, deformation of the economy, which is caused for example by economies of scale and monopolistic power of the market. Gemechu et al. (2012) defined an environmental tax on products based on their carbon footprint. Therefore, it is worthwhile for policy-makers to pay attention to the implications of considering green tax or emissions tax in order to make their policy measures effective and meaningful. Hwang and Kim (2017) analyzed environmental tax, energy tax and the Emissions Trading System (ETS) using strong, balanced panel data from 19 OECD countries for 1996-2009. The results reveal that the static effect of energy tax on exports is negative, but the dynamic effect is positive. Silajdzic and Mehic (2018) we investigated the impact of environmental taxes on CO2 emissions in the context of emerging market economies, providing rather strong evidence in support of an inverted U-shaped relationship between economic growth and the environment. However, environmental taxes do not seem to be effective in modifying the behaviour of economic agents and in protecting the environment. In different conditions, Agnolucci (2009) made evaluation of the effect of the environmental tax reforms introduced in Germany and the UK, concluding that environmental tax reforms can deliver substantial reductions in energy consumption. The importance to deal with environmental taxes is connected also with European directives for waste management, reuse and recycling, energy recovery.

2. METHODOLOGY AND RESEARCH METHODS

The goal of the contribution is to analyze position and importance of environmental taxes establishment in Visegrad region (V4). To achieve determined goal, there was made analysis of environmental taxes in tax system of Slovakia, development of tax rates and collection of environmental taxes.

During realization of the research secondary data and database of tax subjects of environmental tax of electricity, coal and earth gas had been applied. The data had been obtained from tax system of Slovak Republic, obtained through portal of Financial Administration of Slovakia and portal of financial statements FinStat.sk, as well as information of taxation in Czech Republic, Poland and Hungary according to Eurostat database. We resulted from the decree of European Commission that defines environmental tax according to Methodology of Eurostat ESA 95 and Decree No 691/2011 about European environmental economic accounts as tax „when tax base is physical unit that has negative impact to the living environment“ (Eurostat, 2018). According to European Commission (2016) ecologic taxes includes for the Eurostat energetic taxes, taxes from transport, taxes from pollution and taxes of sources. As illustrated in classification, among ecological taxes belong also fees that are defined as obligatory, not refundable payment to public budgets and extra budgetary funds that could be seen as payment for certain ecologic services. Value added tax, given to the goods that have negative influence to the living environment, is excluded according to this methodology from the group of environmental taxes. For processing of obtained results, methods of description statistics, contingent tables and tools of graphical illustration had been used.

Complex function of the tax is in economic theory marked as tax incidence (Andreoni, 2019; Gao et al., 2019; Toprak, 2018) and it is distinguished in legal and effective level. Actual law, determining subjects that are obligatory to pay the tax in time and in full level, determines legal impact. Effect of such function could be effort of economic subjects to avoid payment, resp. to transmit tax burden to other subject (. According to position in distribution net the tax could be transited back and forth (Andreoni, 2019; Toprak, 2018), consumption tax could not be transited forth, but it has tendency to be transited back to the production factors (Rothbard, 2001). Transition is toward increasing of prices of taxed product, adaptation of prices of production factors is yet secondary. Final impact of taxation depends according to Rothbard (2001) mostly on the level of tax burden, not its type. As for the ecologic taxes there are searching also impacts to the living environment, economic subjects and sectors of national economy in area of impacts to the technological changes, costs decreasing, competitiveness, payment ability, etc. between most common effects of environmental taxes application belong:

- Effect of costs decreasing;
- Effect of eco-innovation processes;
- Fiscal effect;
- Stimulation effect;
- Effect of impact to competitiveness.

Producer during applying of environmental taxes tries to decrease pollution of living environment to the time when minimize maximally its costs. Level of costs savings is calculated as difference between levels of environmental tax that had been paid in case of not realizing of measurements. Effect of environmental tax to the effectiveness of financial sources allocation with goal to decrease living environment pollution is reflected during application of the same level of environmental tax for all polluters, which means without regard to their marginal costs for decreasing of living environment pollution. During application of environmental taxes, any polluters would decrease pollution only when his marginal costs of pollution decreasing will be equal to the level of environmental tax. Economic subjects with low costs of pollution decreasing will decrease emission more than subjects that invest higher costs.

Introduction of environmental tax enables economic subject to use innovation and top technologies and by this way to minimize the costs. It means that establishment of environmental tax in comparing with direct regulation creates for the polluters bigger stimulation space for eco-innovation applying

(Arouri et al., 2012). Effectiveness of sources is important not only from the ecological, but also from the economic view. Using of smaller volume of sources at the higher production is basic theme during environmental taxes introduction. Attributes of success of environmental taxes introduction had been studied by number of authors: Spratt (2013) in so-called 3E model, which evaluates effectiveness of environmental regulations (see Table 1), by the way of seven principles that correspond with general tax principles of effectiveness, righteousness, tax certainty, transparency, etc.

Table 1. Review of basic and supplementary criteria of 3E model

Criteria	*Relevant question*	*Character of criteria*
Environmental efficiency	Is demanded goal achieved by application of given criteria?	Basic
Economy	Is given tool implemented with minimal costs?	Basic
Effectiveness	Is achieved the best relation between contributions and costs?	Basic
Public incomes	What volume of public incomes is generated by given tool?	Supplementary
Innovation	What impact has implementation of given tool to the innovation activity? Is it speeding up or slowing down the innovation activity?	Supplementary
Impact to the economic subjects	What impacts to the competitiveness bring implementation of environmental tool?	Supplementary
Broader economic effects	What influences to the macroeconomic indexes has implementation of given tool?	Supplementary

Source: Spratt (2013)

Research of development and evaluation of environmental taxes had been done according to the newest available data from databases Eurostat, OECD, Ministries of individual V4 countries, and Customs and Taxes Administrations of individual V4 countries.

3. RESULTS

Development and evaluation of environmental taxes Following tables 2-4 there is illustrated development of environmental taxes in V4 region during 2017 according to tax burden, mineral oils and gas, development of tax from electric energy and comparing of rates for electricity, coal and earth gas.

Table 2. Comparing of tax burden for mineral oils of oil fuel and petrol in V4

V4 country	*Tax from mineral oils Oil fuels*	*Tax from mineral oils Petrol*	*Price in Euro*	
			Oil fuels	*Petrol*
Slovakia - basic rate - decreased rate	 386.40 368.00	 550.52 514.50	1.131	1.285
Czech Republic	415.94	487.73	1.120	1.151
Poland - basic rate - decreased rate	 342.74 -	 428.00 392.16	1.041	1.079
Hungary	356.90	388.11	1.158	1.147

Source: own processing according to Institute of financial policy, MF SR, Tax report

Tax rates had been calculated according to average currency in 2018: CZK 26.326; HUF 309.193; PLN 4.257. The lower tax rate is applied for fuels with volume of biogenic element – bioethanol in case of petrol and biodiesel in case of oil fuel.

Table 3. Comparing of tax from electric energy in V4 (to 1.1.2019)

V4 country	*For commercial goal (EUR/MWh)*	*For other goals (Eur/MWh)*
Slovakia	1.32	0.00
Czech republic	1.14 (28.30 CZK/ MWh, without 21% VAT)	1.14
Poland	4.73	4.73
Hungary	1.00	1.00

Source: OECD

Following table 4 illustrates comparing of tax rate of consumption tax from electricity, coal and earth gas in V4 in 2018.

Table 4. Comparing of tax rate for electricity, coal and earth gas in V4

V4 country	*Tax rate for electricity / MWh*	*Tax rate for coal / GJ*	*Tax rate for earth gas*	
			Fuel / GJ	*Oil fuel / GJ*
Slovakia	1.32	0.36 (10.62 / 1t)	0.37 (1.32 / MWh)	2.60
Czech republic	1.07	0.32	0.32	2.79
Poland	4.70	0.30	0.30	2.48
Hungary	1.00	0.28	0.30	2.66

Source: own processing according to Institute of Financial policy, MF SR, Tax report

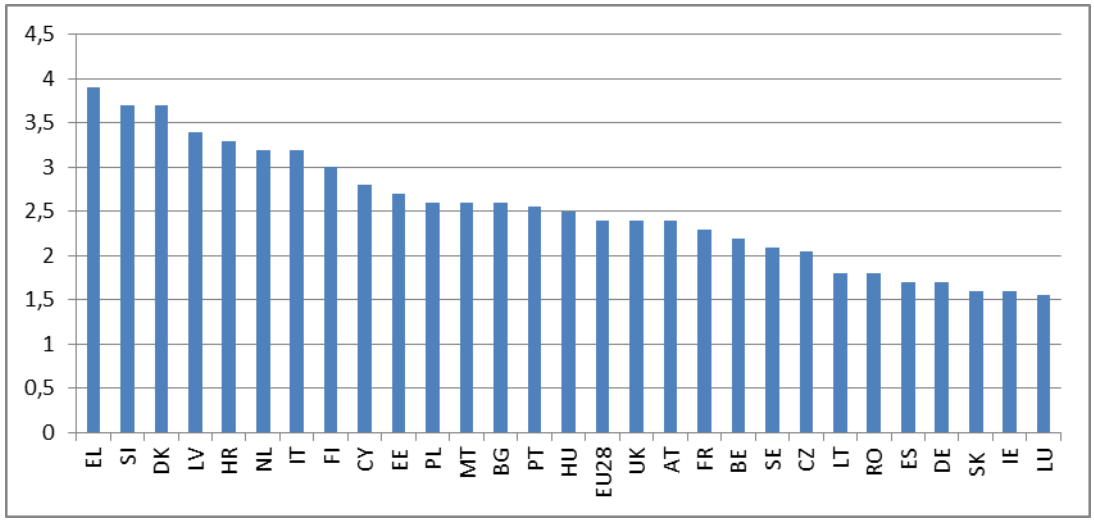

Figure 1. Environmental tax revenue as % of GDP in 2018

Source: Eurostat

From the mentioned there is resulting that consumption of electricity is mostly taxed (without VAT influence) in Poland. Tax rate in Poland is more than four times higher in comparing with the lowest taxation in Hungary. Final taxation of electricity and other energy depends also on used VAT rate in

individual countries (Slovakia 20 %, Czech Republic 21 %, Poland 23 %, and Hungary 27 %). Coal taxation in V4 region is not very different. Slovakia has after currency considering to the same measure unit the highest rate. Hungary does not achieve either minimal level of rate, determined by EU. Taxation of earth gas is divided to taxation of fuel for production of heat and taxation for production of CNG, used as oil fuel. Earth gas is taxed by lower rate for heat production, when Slovakia in comparing with other countries has the highest rate. Earth gas for production of oil fuels is mostly taxed in Czech Republic.

3.1 Analysis of environmental tax collection in V4

Slovakia

In spite, Slovakia knows necessity of taxes application as environmental tools for living environment protection, the contributions do not achieve demanded level, applied in developed economies of EU member states. Following table 5 presents incomes from environmental taxes in Slovakia in comparing with average 28 EU member states during 2009 -2017.

Table 5. Incomes from environmental taxes in Slovakia and EU average (% GDP)

Incomes	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
SR	1.91	1.82	1.81	1.72	1.72	1.77	1.76	1.81	1.76
EU average	2.35	2.37	2.40	2.43	2.45	2.45	2.43	2.44	2.40

Source: Financial Administration SR; Eurostat

From mentioned there is obvious that incomes from environmental taxes in Slovakia are under EU average during all analyzed period. Consumption tax from mineral oils is from the view of incomes the most important selective consumption tax.

Czech Republic

In Czech Republic environmental taxes present national taxes with partial character of transnational taxes. Revenues of environmental taxes come in full level to the state budget. Transnational criteria are accomplished from the view of European Union and Decree No 2003/96/ES. Development of revenues from environmental taxes in Czech Republic according to individual types is given in Figure 2.

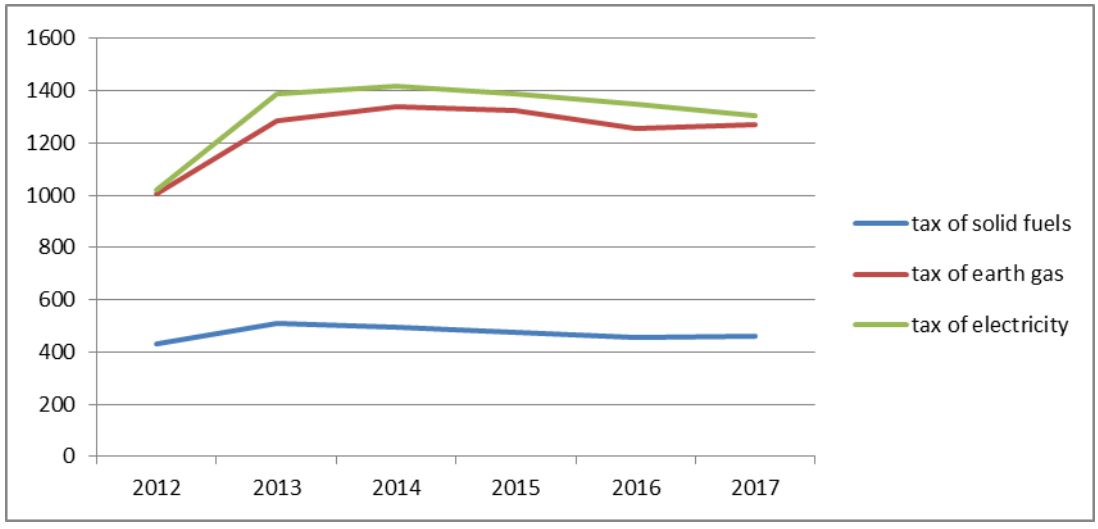

Figure 2. Revenues of environmental taxes in Czech Republic in mil. CZK

Source: own processing according to Customs Administration, CZ

As for the rate of incomes from environmental taxes on total taxes in state budget of Czech Republic, we see in Table 6 that the rate has fluctuated in the time development, when the biggest rate was in 2014, gradually decreasing to 3.04 in 2017.

Table 6. Rate of incomes from environmental taxes and on total taxes of Czech Republic state budget (in mld. CZK)

	2012	*2013*	*2014*	*2015*	*2016*	*2017*
Total incomes	1063.94	974.61	1000.38	1012.76	1051.39	1091.86
Incomes from environmental taxes	2.45	3.18	3.25	3.19	3.06	3.04

Source: Ministry of Finance, CZ

Poland

As a share of GDP, Poland has the 13th lowest environmentally related tax revenue among 34 OECD and 5 partner economies. In 2014, environmentally related tax revenues were at 1.79% of GDP, compared to 2.0% on average among the 39 countries. In Poland, taxes on energy represented 92% of total environmentally related tax revenue, compared to 70% on average among the 39 countries (OECD, 2017).

Table 7. Development of environmental taxes in Poland (in bil. Eur)

	2009	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*Ranking 2017*	*Revenue 2017*
Environmental taxes	*As % of GDP*										
Environmental taxes	2.5	2.7	2.6	2.6	2.4	2.6	2.7	2.7	2.7	11	12.5
Energy	2.1	2.3	2.2	2.2	2.1	2.2	2.3	2.3	2.3	7	10.9
of which transport fuel taxes	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	5	
Transport	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	22	1.1
Pollution and resources	0.22	0.22	0.22	0.18	0.09	0.16	0.17	0.14	0.12	8	0.6

Source: EU Open Data Portal

Hungary

Green taxation and environmentally harmful subsidies financial incentives, taxation and other economic instruments are effective and efficient ways to meet environmental policy objectives. The circular economy action plan encourages their use. Environmentally harmful subsidies are monitored in the context of the European Union and the energy union governance process. Hungary's revenue from environment-related taxes remains higher than the EU average. Environmental taxes accounted for 2.53% of GDP in 2017 (EU-28 average: 2.4%) (see Figure 8) and energy taxes for 1.91% of GDP (EU average 1.84%) 129. In the same year, environmental tax revenues were 6.6% of total revenues from taxes and social security contributions (EU average 5.97%). The structure of taxation shows a share of revenues from labor tax in total tax revenues in line with the EU average, with 46.1% in 2016, while the implicit tax burden on labor was 41.6% 130. Consumption taxes remained relatively high (40.2%, 6thin EU28), pointing at limited potential for shifting taxes from labor to consumption and in particular to environmental ones (Environmental Implementation review, 2019).

Table 8. Environmental taxes by the main categories (in mil. HUF)

	2013	*2014*	*2015*	*2016*	*2017*
Energy taxes	469 673	483 843	494 608	513 041	500 827
Pollution taxes	16 775	18 894	22 672	28 393	33 855
Resource taxes	17 588	18 229	16 948	19 415	19 116
Transport taxes	49 985	51 737	62 757	66 417	64 085
Total	554 021	572 703	596 986	627 265	617 883

Source: ACCACE, Tax Guide for Hungary

The structure of taxation shows a share of revenues from labor tax in total tax revenues in line with the EU average, with 46.1% in 2016, while the implicit tax burden on labor was 41.6%. Consumption taxes remained relatively high (40.2%, 6thin EU28), pointing at limited potential for shifting taxes from labor to consumption and in particular to environmental ones In its European Semester process, the Commission has repeatedly recommended that Hungary modify its taxation system. The 2018 country report noted that household energy consumption in Hungary is still exempt from energy tax and that car tax receipts had stagnated. However, there are some examples of sound fiscal measures for the environment. One is the load charge of air pollution that was introduced in 2003 and has helped reduce air pollution levels in some areas of the country.

Meanwhile, fossil fuel subsidies increased in the past decade, mainly thanks to new tax exemptions for district heating and fuel use for agriculture, railways and commercial purposes. Some subsidies remain in place for the decommissioning and reorganization of the coal sector. These budgetary transfers and subsidies added up to HUF 12 billion in 2016, and the tax exemptions (both local and central governments included) exceeded HUF 123 billion. Some progress has been made on reducing the 'diesel differential' (difference in the price of diesel versus petrol) since 2005. In 2016, there was still a 9% gap between petrol and diesel tax rates, while in 2005 it was 22%. Excise tax rates levied on petrol, and diesel in 2016 slightly decreased in comparison with those in 2015 (HUF 120 per liter for petrol and HUF 110.35 for diesel). The reduction was bigger for diesel than for petrol. Tax treatment for company cars is a cause for concern in Hungary. Tax subsidies still encourage the private use of company cars. Nevertheless, new preferential taxes for electric and hybrid company cars were introduced in 2018 (Environmental Implementation Review, 2019).

CONCLUSIONS

Problems of environmental taxes evaluation and their influence to the business environment pointed to the environmental taxes as the systematic tool for solving of environmental policy not only at the national, but also at the multinational level. The goal of the contribution was to analyze position and importance of environmental taxes introduction to the tax system and to search their influence to the business environment. According to the results, we concluded and recommended to realize in analyzed region systematic environmental tax reform, supported by information campaign with goal to support business environment towards pro-innovation activity, and at the same time to create innovation centers and innovation clusters at the national and local level. Results of the contribution prove also influence of the environmental taxes introduction to the tax system to the fiscal problems, and primary impact to the business subjects' behavior with orientation to their innovation activities and realization of eco-innovation processes that have positive influence to the living environment.

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