

The state of environmental taxation in Ukraine and the main directions of reform

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The article analyzed the state of environmental taxation in Ukraine to assess the degree of implementation of environmental, fiscal, and incentive functions. For this purpose, the analysis is carried out the dynamics of environmental tax revenues to the consolidated budget of Ukraine in the context of the receipt of funds to state and local budgets and their general and special funds. Evaluation structure and dynamics of expenditures on environmental protection and the level of completion of the planned in the consolidated and state budgets of financing expenditures on environmental protection. Based on comparing the results of the analysis of environmental tax revenues and expenditures for environmental protection, it is concluded that environmental taxation in Ukraine does not fully perform environmental and fiscal functions. Analysis of the dynamics of the relationship of the number of environmental tax revenues to the consolidated budget to the volume of capital investment of enterprises in environmental protection showed that environmental taxation in Ukraine does little to stimulate investment by enterprises in this direction. Thus, the investigation results made it possible to conclude about the insufficient level of efficiency of environmental taxation as a tool for implementing state environmental policy in Ukraine. To improve the system of environmental taxation, ways to reform it are proposed, taking into account the experience of countries with developed economies.

Keywords: environmental taxation, the environmental function of taxation, a fiscal function of taxation, incentive function of taxation

Introduction

Environmental protection is a necessary element of the state strategy for sustainable development. Taxes are the most influential tool of environmental policy in many countries around the world. According to the environmental component of sustainable development, Ukraine in 2020 takes 109th place out of 180 countries (Environmental Performance Index, 2020), which indicates a low level of environmental protection in Ukraine. Consequently, taxation is not a sufficiently useful tool of environmental policy in Ukraine. Ukraine's tax policy in nature management must take into account modern world trends and be effective in stimulating environmental protection measures. Ukraine has made international commitments on environmental protection, and promoting the long-term goals of sustainable development with low fiscal efficiency of environmental taxation systems determines the need for its modernization. That is why improving the system of environmental taxation in Ukraine is extremely important and actual.

Taxes are considered the most effective tool to reduce the negative impact of human activities on the environment among all available instruments (Zoltán, 2013). The founder of environmental taxation is A. C. Pigou, who in the 1920s first determined the environmental costs of production and formulated an understanding of the need to introduce a tax that adjusts economic costs to a level commensurate with the costs of society. In his book "The Economics of Welfare", A. C. Pigou (1932) proposed special taxes to correct negative externalities (including environmental damage) and compensation in the form of subsidies for those who improve the environment.

The theory of A. C. Pigou further developed the work of G. Tullock (1967), who suggested that the environmental tax could be an alternative to traditional taxation in the formation of the state budget. Through environmental taxation, two problems are solved at once - (1) the state has a stable income (the tax performs a fiscal function), and (2) prevents environmental damage (the tax performs a compensatory and preventive function).

Compensation for environmental damage is part of the concept of "Double Dividends" from the introduction of environmental taxes: (1) environmental taxes improve the environment (2) ecological taxes increase budget revenues. By introducing an ecological tax, it is possible to improve both ecological conditions and budget revenues while reducing other taxes to maintain the tax system's optimality. Interest in ecological taxation as an instrument of environmental policy in the world began to grow

in the 1970s (Sandmo, 2009). Many scientists and economists who have investigated the double dividend effect have not agreed on the existence of a double dividend.

Theoretical and empirical evidence of the presence of a double dividend devoted to the investigation of L. H. Goulder (1995), in particular, the scientist concludes the doubtfulness and ambiguity of such evidence. Much research has been devoted to testing the double dividend hypothesis, including J. Freire-González (2018). After analyzing the results of 69 different models from 40 types of research, J. Freire-González argues that a double dividend is achieved in principle. However, if the environmental dividend is almost always achieved, then the existence of an economic dividend remains an ambiguous issue. P. Bohm (1997) concluded that a positive environmental dividend is always achieved.

According to the conclusions of W. E. Oates (1995), the real consequences of environmental pollution cannot be estimated, and therefore the hypothesis of a double dividend is unfounded. The existence of a double dividend effect is also denied by G. Glomm et al. (2008), D. Fullerton & G. E. Metcalf (1997), who confirms that in certain circumstances, the transition to environmental taxes may increase the overall pressure of the tax system. D. Fullerton & G. E. Metcalf (1997) also demonstrated that the increase or loss of welfare due to the new environmental policy depends significantly on (1) the receipt of rents for the use of scarce resources and (2) whether the government reduces other taxes.

The investigation of whether the replacement of environmental taxes on taxes on labor and capital can provide a "double dividend", i.e., not only improve the environment but also to reduce certain losses of the tax system, devoted to the work of L. H. Goulder (1995) and A. M. Bento & M. Jacobsen (2007). A. M. Bento & M. Jacobsen (2007) demonstrated how to reform the tax system with the introduction of an environmental tax and lowering existing labor taxes could lead to higher budget revenues. E. Fernández et al. (2011) based on a dynamic model of general equilibrium demonstrated a wide range of options for environmental tax reforms, which correspond to the hypothesis of double dividend without changing the structure of production and the tax system. M. H. Babiker et al. (2003) analytically showed that in an economy with numerous deformations, the effect of double dividends is not achieved.

L. H. Goulder (2013) concludes that the main critique of the double dividend hypothesis focuses on the economic dividend, there is no objection to the positive influence of ecological taxes on the environment. Ecological taxes should be introduced gradually, replacing other taxes to stimulate sustainable development technologies (Von Weizsacker, 1990). T. R. Sadler's (2001) work is devoted to the goals of environmental taxation and the analysis of compromises in the formation of tax policy.

Thus, systematizing the above, we can confirm that ecological taxation should perform the following functions: (1) environmental (compensatory) – sources of financial resources to finance measures for the protection and restoration of the environment; (2) incentive (preventive) – stimulating investments of polluting enterprises in environmental protection measures and nature conservation technologies; (3) fiscal – the use of funds from the payment of ecological tax to replenish budget revenues. Given the above, in this investigation, we try to (1) evaluate the completion of ecological taxation of its functions in Ukraine, (2) identify problems and shortcomings of the environmental taxation system in Ukraine as an instrument of public ecological policy, (3) outline approaches to its reform taking into account European experience.

Methods

To study the theoretical foundations of ecological taxation, the method of a systematic review of scientific literature (articles, monographs) by foreign and domestic authors on this topic was used. The investigation of the existing practice of ecological taxation in Ukraine and abroad was conducted using a systematic review of laws and regulations and legal acts and the Internet's electronic resources. Analytical calculations were performed on the materials of the State Statistics Service of Ukraine and the State Treasury of Ukraine. Evaluation (1) of income of the ecological tax to the consolidated budget of Ukraine from 2011 to 2019, (2) the distribution of the funds between the budgets and the general and special funds of the budgets; (3) expenses on environmental protection and (4) the level of completion planned in the consolidated budget financing of expenditures for environmental protection was conducted using the methodology of structural analysis and construction of dynamics series.

Evaluation of the completion of ecological taxation of environmental and fiscal functions was performed using the comparison method. We compared the results of the analysis of earnings of the ecological tax and expenditures for environmental protection in the consolidated budget of Ukraine and made a logical generalization.

To set the action of the ecological tax's stimulating function, the authors of this article proposed an indicator – the identifier of the action of the incentive function of the environmental tax. It is calculated by the ratio of the number of ecological tax revenues to the consolidated budget with the amount of capital investment of business entities in environmental protection:

$$I = \frac{\sum E}{\sum K}, \quad (1)$$

where I is the identifier of the action of the stimulating function of eco-taxation;

$\sum E$ – the annual amount of ecological tax (monetary units);

$\sum K$ – the annual amount of capital investment in environmental protection by enterprises in Ukraine (monetary units).

The stimulating function of the ecological tax is achieved when the dynamics of indicator I will be declining, i.e., $I \rightarrow 0$.

The evaluation of the level of completion of the incentive function of the ecological taxation system of Ukraine of stimulating function was held for the period from 2011 to 2019 using the method of analysis of time series of the proposed indicator.

To compare the functional component of the ecological taxation system in Ukraine and EU countries, the method of comparative analysis was used.

Results and Discussion

In their economic essence, ecological taxes are compensation for damage caused to the environment and should correspond to society's losses caused by environmental pollution. Ecological taxation is based on the "polluter pays" principle, according to which losses are compensated by the factor due to which they arose. The amount of ecological taxes paid should cover the cost of financing the measures needed to restore the environment. Types of influence can be different, so there are many environmental payments in world practice.

The system of ecological taxation has been formed in Ukraine since the early 1990s. Since gaining independence in 1991, Ukraine has had an ecological tax paid for pollutants' emissions into air pools and discharges of wastewater into water basins, and damage to the environment. In 1994, it was replaced by a pollution charge, which in 1997 was replaced by a pollution charge. In 2009, to adequately fund the creation and maintenance of radioactive waste storage facilities, Ukraine's environmental taxation was supplemented by a fee for the generation and temporary storage of radioactive waste. All of them had different tax bases, which does not ensure the correctness of comparing their revenues. With the adoption of the Tax Code of Ukraine in 2011, the environmental tax was reintroduced. Environmental tax - a nationwide mandatory payment (Tax Code of Ukraine 2020 (Qld), p.240-250). Objects of environmental tax are: 1) the volume and types of pollutants emitted into the atmosphere by stationary sources (59.3% in the structure of environmental tax revenues in 2019); 2) volumes and types of pollutants that are discharged directly into water objects (2.6%); 3) volumes and types (classes) of disposed waste, except for volumes and types (classes) of waste as secondary raw materials, which are placed on the own territories of business entities (20.5%); 4) volumes and category of radioactive waste are generated as a result of the activity of economic entities and temporarily stored by their producers beyond the term established by the special conditions of the license (17.6%).

The amount of environmental tax revenues to the state, local and consolidated Ukraine budgets during 2011-2019 is growing (Fig. 1), due to the constant increase in tax rates throughout its existence.

However, the share of environmental tax in the consolidated budget revenues is small (from 1.06% in 2014 to 0.42% in 2018), the state allocates significantly more funds to finance environmental protection than it receives from its revenues (Fig. 1).

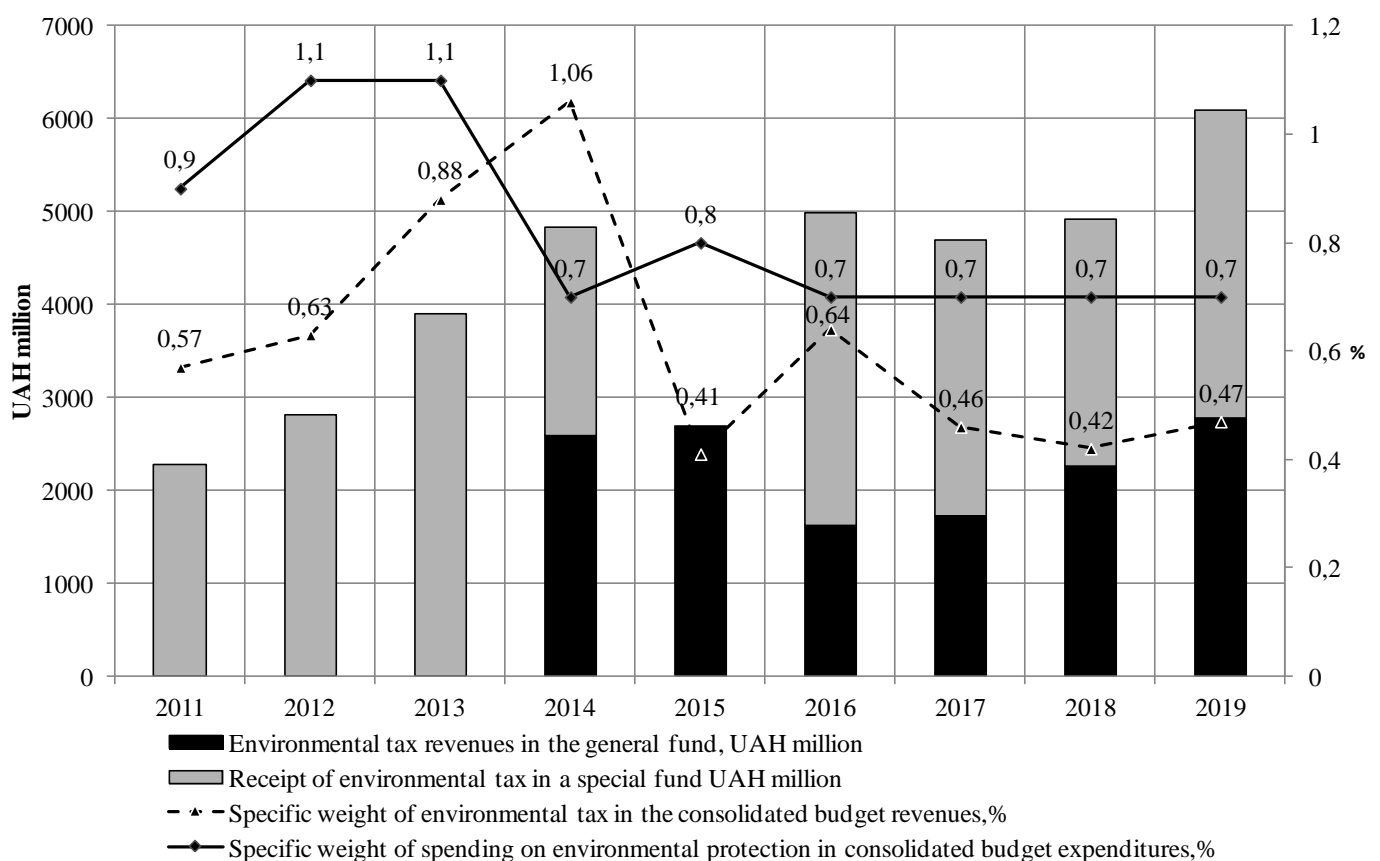


Fig.1. Earnings, specific weight of revenues, the structure of environmental tax distribution, and specific weight of expenditures on environmental protection in the consolidated budget of Ukraine for 2011-2019 (built by the authors according to the reports of the State Treasury Service of Ukraine (State Treasury Service of Ukraine 2020))

The distribution of funds from the payment of environmental tax, except for the part related to radioactive waste, is established by the Budget Code (Budget Code, 2010). During 2011-2020, the order of this distribution changed several times (Table 1). Since its introduction, the environmental tax has been distributed between the levels of the budget system and special and general budget funds. Expenditures are made through the special budget fund, which has clearly defined areas of use (i.e., environmental tax receipt in the particular budget fund is directed to environmental protection expenditures). In contrast,

through the general fund, the expenses for budgeting by the state and local governments of general functions - rendering of educational and medical services, social protection, and defense are carried out.

Table 1. Legislative distribution and the actual structure of the environmental tax in Ukraine for 2011-2020.

Budget	Fund	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Environmental tax in addition to the part for the generation and storage of radioactive waste and from 2019 in addition to the environmental tax, which is levied on emissions of carbon dioxide into the atmosphere by stationary sources of pollution											
State budget	General fund				53.5%	20%	20%	45%	45%	45%	45%
	Special fund	30%	30%	53%	11.5%						
Regional budgets/ budget of the ARC	General fund					55%					
	Special fund	20%	20%	13,5%	10%		55%	30%	30%	30%	30%
Budgets of villages, settlements, cities, ATC	General fund					25%					
	Special fund	50%	50%	33,5%	25%		25%	25%	25%	25%	25%
Budget of Kyiv and Sevastopol	General fund					80%					
	Special fund	70%	70%	47%	35%		80%	55%	55%	55%	55%
Environmental tax for the generation and storage of radioactive waste (since 2009)											
State budget	General fund				100%				50%		
	Special fund	100%	100%	100%		100%	100%	100%	50%	100%	100%
Environmental tax levied on air emissions of carbon dioxide from stationary sources of pollution (from 2019)											
State budget	General fund	-	-	-	-	-	-	-	-	100%	100%
	Special fund	-	-	-	-	-	-	-	-	-	-
The actual structure of the environmental tax in the consolidated budget											
General fund, %		0	0	0	54	100	32	37	46	46	-
Special fund, %		100	100	100	46	0	68	63	54	54	-

If until 2014 all revenues of the environmental tax in Ukraine were directed to a special budget fund, from which expenditures on environmental measures are made, then from 2014 a significant part (from 32% to 46% (Table 1), 100% in 2015) of the environmental tax is transferred to the general fund of the budget, that is, the fiscal function begins to prevail over environmental.

Revenues of the environmental tax to the State Budget of Ukraine do not have a clear tendency to change, as do revenues to local budgets. This is due to the legislative change in the proportions of these funds' distribution (Table 1).

The specific weight of environmental tax in the consolidated budget revenues (from 0.41% to 1.06%) and the specific weight in tax revenues (from 0.53% to 1.31%) are insignificant and tend to decrease (Fig. 1). In 2006-2010 (before the consolidation of the legal mechanism for collecting environmental tax by the Tax Code), the specific weight of environmental payments did not exceed 1% of the consolidated budget revenues. In the structure of environmental tax revenues to the consolidated budget, there is an increase in environmental tax revenues, which is paid for air pollution and its share (from 37% to 63%) in the total amount of environmental tax, as well as the amount of environmental tax for the generation and temporary storage of radioactive waste and its share (from 14% to 26%), in the total revenues of the environmental tax. The environmental tax for the formation and temporary storage of radioactive waste is sent in full to the state budget, and its share in the state budget revenues from the environmental tax is quite significant - up to 64%.

Revenues from the environmental tax should be a source of funding for environmental measures, and its amount should be sufficient to compensate for the damage caused to the environment by "polluters". However, there is no direct link between the financing of environmental measures and the receipt of environmental tax to the budget (Fig. 2). Throughout the environmental tax, its revenues (except for 2014) were lower than expenditures on environmental measures. This indicates that the environmental function of the tax is not fully fulfilled. Due to the environmental tax, only 50 to 80% of environmental measures can be financed (35-70% if we compare environmental protection costs with revenues from the environmental tax, not related to radioactive waste).

Expenditures on environmental protection measures are generally increased (Fig. 2), but the specific weight of expenditures in this area in the country does not exceed 1.1% of all expenditures (Fig. 1). Simultaneously, no more than 0.5% of local budgets' expenditures are directed to environmental protection and no more than 1.6% from state budgets. In the budgets of European countries, expenditures on environmental measures account for up to 5%. Countries similar to Ukraine regarding pollution direct 1.4 – 2% of total government spending in this area (Kanonishen-Kovalenko, 2017).

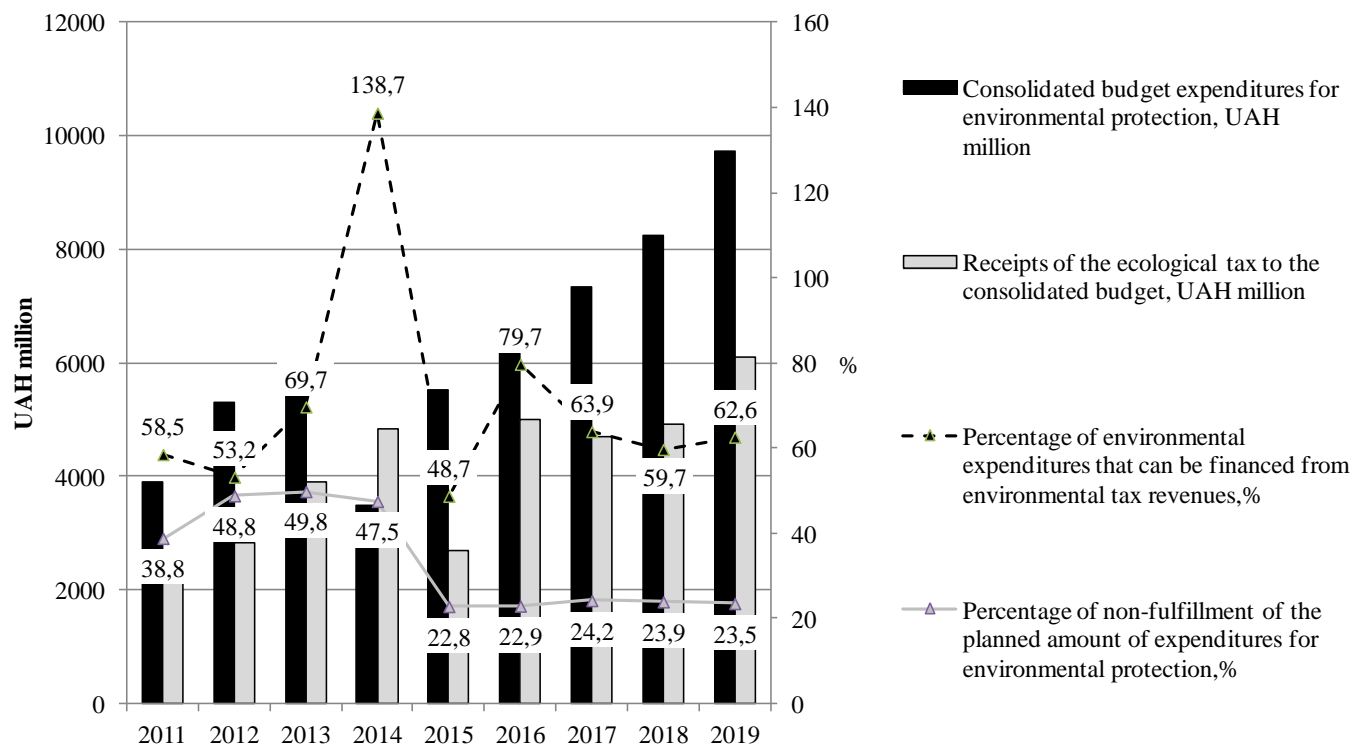


Fig. 2. Revenues of the environmental tax, expenditures for environmental protection, and their actual implementation in the consolidated budget of Ukraine for 2011-2019 (Built by the authors according to the reports of the State Treasury Service of Ukraine (State Treasury Service of Ukraine 2020))

In the structure of expenditures for environmental protection in Ukraine, expenditures for prevention and elimination of environmental pollution amount to 65.1% (of which expenditures for waste disposal – 23.4%; expenditures on protection and rational use of natural resources – 19.2%; expenses for the elimination of all other types of other pollution – 22.5%); preservation of the nature reserve fund – 5.7%; basic and applied research and development in the field of environmental protection – 2%; other activities in the field of environmental protection – 27.2% (general leadership and management in the field of environmental protection of Ukraine; advanced training and retraining in the field of ecology and natural resources, financial support of targeted projects of ecological modernization of enterprises). The structure of expenditures on environmental protection differs significantly in different European countries. France, the United Kingdom, Spain, and Italy spend more than half of their environmental spending on waste management; Germany and Poland up to 20% of expenditures.

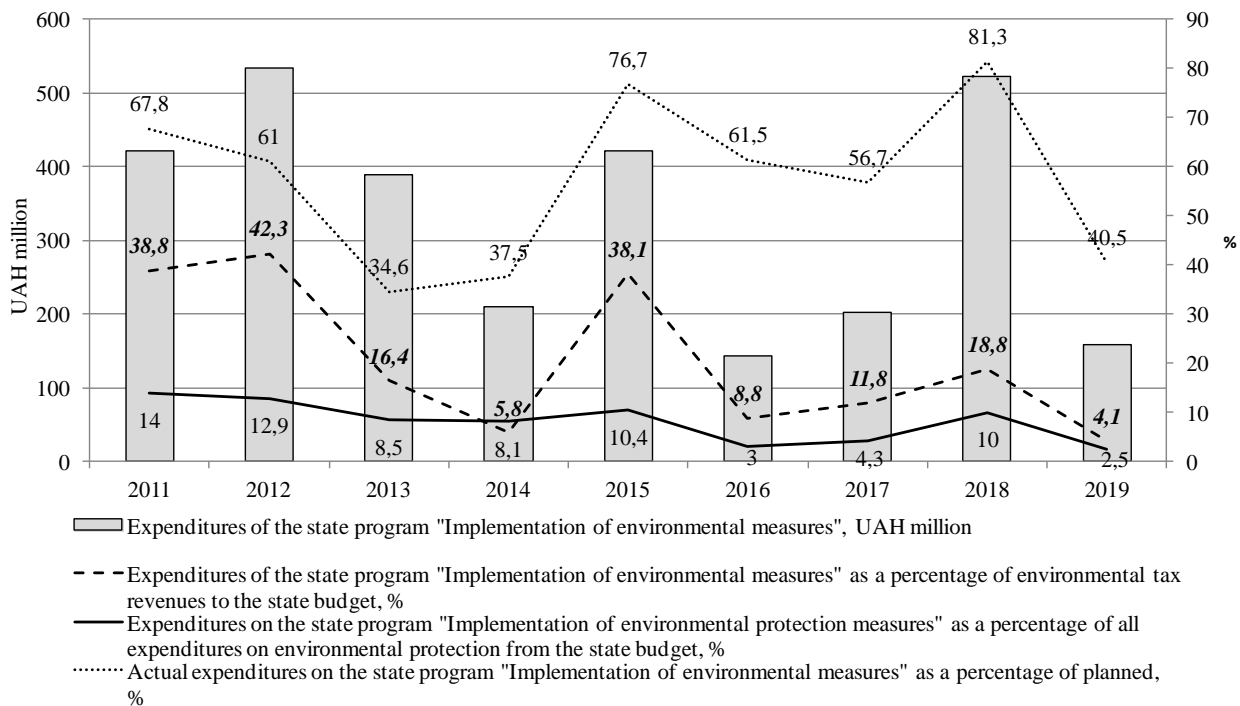
The efficiency of financing environmental expenditures in Ukraine is very low – underfunding of the planned amount of environmental expenditures in the consolidated budget is from 24% to 50% (Fig. 2). There is a negative trend of reducing the share of expenditures to improve the environment, and expenditures for the state program "Implementation of environmental measures" in the total state budget expenditures on environmental protection (Fig. 3) is significantly reduced from 14% (in 2011) to 2.5% (in 2019). Only 4.1% in 2019 of the environmental tax's actual revenues to the state budget is spent on financing the state program "Implementation of environmental measures" (Fig. 3). Simultaneously, the unfulfillment of planned expenditures for realizing the state program "Implementation of environmental measures" is up to 60% (Fig. 3).

The environmental tax funds are not used transparently and efficiently enough, which does not improve the state of the environment.

Environmental measures in the field of nuclear and radiation safety, based on the nature of the environmental tax, should be financed exclusively from the state budget, funding for other environmental measures should be delegated to local budgets. In recent years, the largest share of environmental taxes (about 57%) goes to the state budget, which indicates the centralization of budget resources, which began in 2013 (Table 1).

The main part of revenues from the environmental tax at the disposal of local budgets is the tax on pollutants' emissions into the atmosphere (74% in 2016). Reflecting further centralization of revenues from the environmental tax is the inclusion of the environmental tax in terms of carbon dioxide emissions into the atmosphere (15.6% in the structure of revenues from the environmental tax) from 2019 to the general fund of the state budget. Consequently, the implementation of this tax is exclusively a fiscal function.

Earnings of the environmental tax to the special fund of local budgets also do not guarantee the targeted use of funds. The results of regional investigations conducted by ECOBUSINESS Group in 2017 (ECOBUSINESS Group, 2020) show that most regions use no more than 10% of environmental tax revenues for their intended purpose, placing the remaining temporarily free budget funds on bank deposits to generate development fund revenues. Revenues from the environmental tax at the local level are used mainly to reconstruct sewers, control quarantine plants, reconstruct urban parks, and not for purposes identified by environmentalists as a priority.



Built by the authors according to the reports of the State Treasury Service of Ukraine (State Treasury Service of Ukraine, 2020)
Fig. 3. Dynamics of expenditures for implementing the state program "Implementation of environmental measures" during 2011-2019.

Regulating the size of environmental tax rates is the only instrument of environmental policy in Ukraine. Several bills under consideration in the Verkhovna Rada of Ukraine provide for further increase of eco-tax rates, particularly the bill of 2020 registration – 2–3 times, including a gradual increase to 10 times by 2029; bill of 2019 registration – 4 times. The order of distribution and use of the collected funds does not change. The distribution of a significant part of the environmental tax revenues in the general fund with simultaneous planning expenditures on environmental measures in the minimum amount indicates a significant inconsistency in environmental policy and, to a greater extent, the fiscal nature of the environmental tax. Therefore, we consider that environmental tax rates raising will not ensure the realization of the function of environmental protection.

The fiscal function of the environmental tax in Ukraine is also insufficiently performed. The fiscal role of the environmental tax is not significant for both local and state budgets. In the State Budget of Ukraine, the share of environmental tax in tax revenues ranges from 0.3 to 1.2%, in local budgets – less than 3%. The level of tax payments from the payment of environmental tax in Ukraine is much lower than in all EU countries - the share of environmental tax in tax revenues of the budget in Ukraine is also the lowest – 0.41 – 1.06%, while in other European countries this figure ranges from 4 to 12%, for example, in Germany and France 4 - 5%, in Poland almost 8% (Kanonishena-Kovalenko, 2017). In European countries, the environmental tax performs both a compensatory function (tax revenues are several times higher than government spending on environmental measures) and fiscal (environmental taxes form up to 10% of all tax revenues).

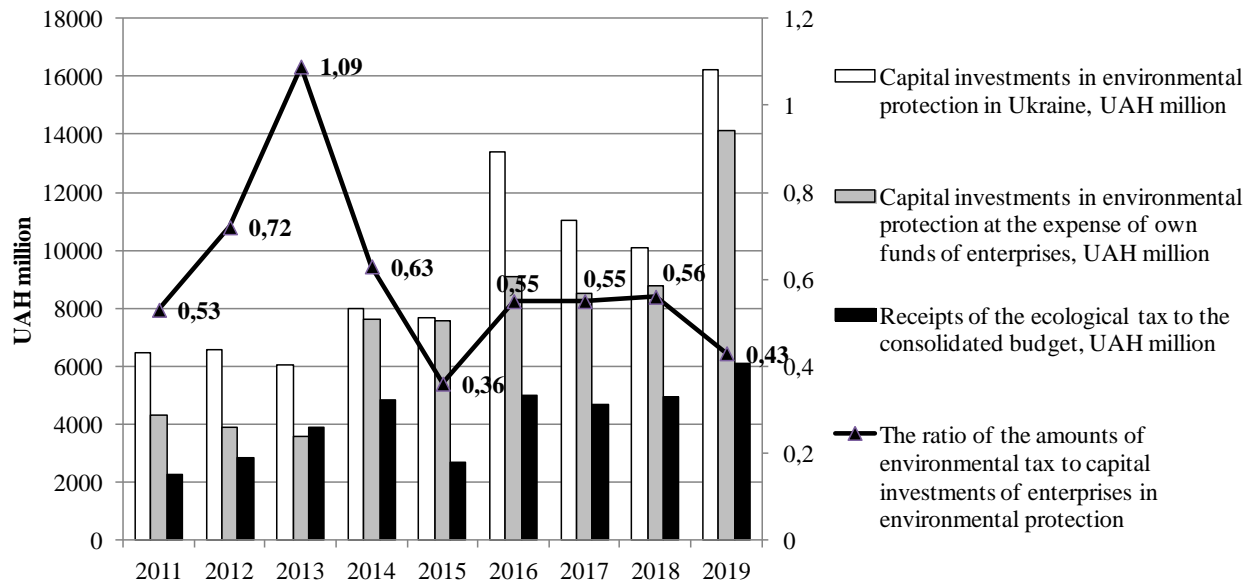
Most environmental taxes and fees' main purpose is not to fill the state budget but payer stimulation to positive from environmental protection (preventive function).

The size of environmental tax rates should be an incentive for Ukrainian producers to use more environmentally friendly technologies. Environmental taxation's preventive function is to stimulate investment by companies "polluters" in environmental measures and conservation technologies. Modernization of production should reduce emissions, pollution, and waste. In perspective, it should reduce the cost of paying environmental tax and liberalize the conditions associated with pollution - simplification of obtaining permits and licenses, increasing standards.

In general, in Ukraine, there is a decrease in the number of pollutants emitted into the atmosphere by stationary sources and a decrease in discharges of polluted return water into water bodies, as well as the total amount of discharged water. However, the tendency to reduce emissions and discharges is caused not by the stimulating function of environmental taxation (modernization of production and implementation of environmental technologies) but by reducing business activity (Kanonishena-Kovalenko, 2017). The dynamics of the number of enterprises that emit pollutants into the atmosphere and the number of enterprises that discharge polluted water into surface water bodies in Ukraine is also declining. The objects of the environmental tax in the natural dimension are decreasing, i.e., the environmental tax base is decreasing. Simultaneously, the amount of revenues from the environmental tax (except for 2015) increases (more than twice in the last ten years).

With the action of stimulating the function of taxes, the growth of tax rates (revenues) should motivate enterprises to modernize production and, consequently, increase capital investment, which will reduce environmental pollution and, consequently, the amount of environmental tax payable. In Ukraine, there is a steady increase in both capital (Fig. 3) and current costs of

environmental protection enterprises and a steady increase in environmental tax rates, but there is no direct link between the dynamics of their growth (Fig. 3).



Built by the authors according to the reports of the State Treasury Service of Ukraine (State Treasury Service of Ukraine 2020), and the State Statistics Service (State Statistics Service 2020)

Fig. 4. Capital investments for environmental protection in Ukraine, the earnings of environmental tax to the consolidated budget, and the ratio of environmental tax amounts to enterprises' capital investments for environmental protection for 2011-2019.

An indicator of the environmental tax's stimulating function is proposed to be a decrease in the ratio of the amount that companies spend on environmental tax (environmental tax earnings) to the amount of capital investment of enterprises in environmental protection (formula 1). Capital investment growth rates for protecting the natural environment must exceed the growth rate of environmental tax revenues to the consolidated budget. The ratio of environmental tax revenues to capital investments of enterprises will decrease, and in this case, it can be confirmed that the stimulating function of the environmental tax acts. In Ukraine, there is no constant decline in this indicator (Fig. 3), and therefore the environmental tax performs an incentive function to an incomplete extent.

Despite the constant increase in environmental tax rates, polluters' financial motivation in Ukraine to reduce emissions, discharges, and waste disposal is insufficient. The biggest polluters, both atmospheric air and water bodies, are business entities of industrial production and economic entities in the production and electricity supply. The environmental tax, which is included in the cost, concerning the income of such entities, is insignificant – from 1% to 2.16% (Mykytenko, 2015); in some sectors of the economy, the amount of payment of environmental tax is at the level of 0.1% of total output. Under such conditions, the minimization of environmental tax for the payer does not provide an additional incentive to modernize and green production. Only one enterprise of PAS "Zaporizhstal" of the group "Metinvest" from the list of "TOP-100 the largest pollutants" in 2016 to replace the furnace filter used a preferential eco credit under the program of the Ministry of Ecology and natural resources together with "UkrGasbank" and international partners (Ministry of Environmental Protection and Natural Resources of Ukraine, 2017), which also indicates low motivation of polluters.

Despite the constant increase in environmental tax rates for almost 30 years (since 1992), in Ukraine, about 95% of industrial production is carried out within the outdated III and IV technological modes, the energy intensity of GDP is 2.5 times higher than the world average, and four times higher than the EU average. The cleaning equipment is worn out by 50–70%, and its restoration is not carried out due to lack of funds; the pace has been reduced, and in some cases, capital construction, reconstruction, and modernization of ecological facilities, the introduction of environmentally friendly and resource-saving technologies have been suspended (Pohorelov & Vakhlyakova, 2016). In waste management in many countries, such as Germany, France, and Poland, more than 60% of treated waste is recoverable, with waste disposal accounting for no more than 30%. At that time in Ukraine, waste disposal is the primary waste management method; its share is 65% (Kanonishena-Kovalenko, 2017). All this confirms the insufficient completion of the vital function in environmental taxation in Ukraine.

At the present stage of development of the national economy, economic incentives are not developing for environmental activities, but there is a gradual departure from this principle. They were setting environmental tax rates based on the real scale of the negative influence on the environment associated with state control over compliance with environmental standards. In the absence of a developed monitoring and control system over emissions and discharges, the increase in environmental payments is ineffective.

Tax control over the payment of the tax and the accrued tax's compliance with the actual emissions into the atmosphere, which is carried out by all 55 thousand business subjects (according to the Accounting Chamber) is complicated, and the economic efficiency of the environmental tax is rapidly declining. The situation requires simplification and transparency of mechanisms

for calculating environmental taxes. In the EU, on the other hand, pollution taxes account for a relatively small share of total environmental tax revenues - up to 10%, in some countries, such as Germany, are absent at all (Kanonishena-Kovalenko, 2017). The low efficiency of environmental taxation in regulating the level of environmental safety in Ukraine forces us to turn to developed countries' experience, especially the European Union, where the use of such taxes is more effective, and in the realization of environmental policy are widely used incentive tax levers. The system of environmental taxation in Ukraine differs significantly from the European Union system in its functions and objectives. In the EU, taxes are increasingly being used to influence all economic subjects' behavior, both producers and consumers. There is no single unified system of environmental payments in European countries. The environmental tax in the EU includes the following groups of payments: energy taxes (taxes on energy products, including coal, petroleum products, gas, electricity, fuel); transport taxes (payments for import, exploitation, utilization of vehicles, their sales, and resales); taxes on environmental pollution (payments for direct emission of pollutants into the air, discharges into water bodies, noise pollution); taxes for the use of natural resources (for extraction of minerals, water intake).

The European Union prefers environmental-based tax instruments because they provide flexible and cost-effective means of strengthening the "polluter pays" principle and achieving environmental policy goals. Earnings from the environmental tax are directed to the issuance of environmental grants and soft loans; tax rebates and specialized funds are created.

In Ukraine, non-tax financial instruments of environmental incentives, such as soft loans, quotas, and permits for emissions trading, targeted environmental subsidies, are practically not used; and also tax instruments of ecological stimulation are not used – tax privileges from the ecological tax; payments and fees from consumers. Implementing the environmental tax in Ukraine of compensatory, stimulating, and fiscal functions is currently insufficient. This situation needs significant changes. It should be borne in mind that the improvement of the environmental tax should happen to take into account Ukraine's existing obligations to the EU, possible risks and the potential of the national economy, and features of financial behavior of households in Ukraine, described in the study of Shkvarchuk and Slav'yuk (2019).

On the one hand, the low level of environmental payments cannot correctly stimulate enterprises to modernize production. On the other hand, the small amount of environmental tax revenues to the budget does not provide a solution to existing environmental problems. It is necessary to take into account the risks of introducing stricter conditions for environmental taxation – a decrease in business activity due to the loss of permits, licenses or too high rates of environmental tax, reducing the profitability of production; rising prices for goods and services due to the desire of producers to maintain the level of profitability; increasing the level of unemployment as a result of termination or reduction of activities of business entities; threats to energy and industrial security due to the cessation or reduction of business entities.

Raising payments to a level comparable to the magnitude of environmental damage is impossible even in terms of a sustainable economy. It is known that in industrialized countries, the damage from environmental pollution ranges from 4 to 8% of GDP. Setting environmental charges at this level will lead to a sharp rise in prices, reduce its competitiveness, and reduce business activity level. For an effective reform of environmental taxation, only increasing environmental payments by adjusting environmental tax rates is not enough. It is necessary to shift the tax charge from the taxation of labor and capital, or only labor or only capital, to environmental taxation, particularly electricity production. This requires independent research.

The question of the consequences and possibilities of introducing environmental taxes in an imperfect market economy and suboptimal tax system has been studied by scientists in Croatia (Hodžić & Bratić, 2015), Romania (Andrei et al., 2016), China (Song et al., 2018; Liu et al., 2019; Fan et al., 2019). Chinese scientists who researched the influence of environmental tax on environmental improvement (Song, 2018) concluded that despite the positive influence of environmental taxation on reducing environmental pollution and economic growth, environmental taxation alone is not enough. Strict state control, active consumer awareness, and innovative technologies that reduce the national economy's resource intensity are also needed. Despite the long and positive experience of environmental tax reform in Denmark, research by J. Klok et al. (2006) shows that awareness of environmental taxation principles is low among both businesses and the general public, and attitudes towards environmental taxation are negative.

Many research types have been devoted to determining the optimal rates of environmental taxation in the tax system. In particular, A. L. Bovenberg & L. H. Goulder (1994) concluded that the optimal tax rate on pollutant emissions is lower and not equal to the marginal environmental damage, as established by A. C. Pigou (1932). The less optimal the tax system without environmental taxes, the lower the rate of environmental taxes that are introduced. The theory of optimal taxation by the English economist and mathematician F. Ramsey (1927), which focused on how to get a certain amount of tax revenue with minimal loss of efficiency for the economy as a whole, derived the concept of optimal tax rates based on demand elasticity. Environmental factors are neglected. Environmental pollution can occur both in the production and consumption of goods. Environmental taxes do not directly affect the state of the environment but affect the volumes of goods and services whose production and consumption need to be reduced. Researches have shown that in the production of goods with very high demand elasticity, a significant influence on the environment can be achieved with a low tax rate. Conversely, when demand elasticity is low, the environment's influence can be minimal, although the tax can bring significant budget revenues (Sandmo, 2009).

Some researchers consider environmental taxes a factor that improves the environment and as a factor in the growth of macroeconomic indicators. There is a third "dividend" hypothesis, which argues that higher environmental taxes, combined with lower payroll taxes, also lead to higher employment. A. L. Bovenberg & L. H. Goulder (2002) investigated the circumstances in which the use of environmental taxation causes an employment dividend. Scientists E. Koskela & R. Schöb (1999), A. Bovenberg & F. Van der Ploeg (1998), S. B. Nielsen et al. (1995) concluded that the decisive factor for increasing employment is the transfer of the tax burden from labor to other primary factors. In particular, in models with capital and labor, the

employment dividend may arise if (1) industries from which the environmental tax is levied have a relatively low complexity than other industries; (2) environmental tax revenues are mainly used to reduce taxes on labor, not capital.

The condition for the greening of the tax system of Ukraine should be a reduction in income taxes of business entities (to increase investment resources) and / or personal income taxes (to increase the solvency of demand). Increasing the tax loading from environmental payments while reducing the tax loading on profits and income should stimulate business to capital investment in the modernization of production without reducing business activity. When forming the tax policy of Ukraine in the field of environmental taxation, it is necessary to take into account not only modern world trends but also tendencies and deformations in the tax system of Ukraine, in particular in terms of significant fragmentation of enterprises for tax optimization (Yaroshevych et al., 2019) and reducing the tax loading on capital.

Conclusion

The results of our research of the state of environmental taxation in Ukraine as a tool for implementing state environmental policy allowed us to draw the following conclusions.

1. The absence of a targeted direction of the environmental tax due to the inclusion of a significant part of its earnings in the budget's general fund makes it impossible to direct such payments to measures to solve environmental problems. It is necessary to ensure the direction of earning from the environmental tax to a particular budget fund, the proceeds of which will be used exclusively for environmental measures. In the long term, systemic reform is needed by analogy with the countries of Central and Eastern Europe, which have special extra-budgetary funds with the status of a legal entity. Such funds will have guaranteed revenues from the environmental tax, programs of priority areas, and transparent mechanisms for decision-making and directing funds for their realization.

With the constant growth of environmental tax rates in Ukraine since its introduction, the number of revenues from this type of taxation and its share in tax revenues remains insignificant and insufficient to finance the necessary environmental measures. Simultaneously, the total expenditures on environmental protection exceed the revenues of the environmental tax as a whole, and these expenditures are financed from other budget revenues.

The constant change of distribution of means from payment of the ecological tax between the state and local budgets and between special and general funds of budgets makes it impossible to form a consistent policy of environmental protection and implementation of long-term programs in this area.

2. The environmental tax performs an insufficient incentive function. Low environmental tax rates do not motivate business entities to modernize their production and use alternative energy sources. The amount of environmental tax paid by enterprises is insignificant, which does not increase capital investment. Therefore, the state programs of preferential crediting of eco-programs of modernization of production, introduced in Ukraine, did not interest business.

3. The environmental tax does not fully perform its fiscal function. In the EU, tax revenues from environmental taxes exceed expenditures, and environmental taxes account for 8–13% of all tax revenues. According to the analyzed indicators, Ukraine is not even close to the EU countries with the lowest level of them, and the amounts of environmental tax payments are insufficient to implement environmental measures.

The current practice of environmental taxation in Ukraine does little to ensure the growth of an environmentally oriented economy and environmental safety. The applied tax mechanisms do not sufficiently stimulate the introduction of innovative resource-saving efficient technologies. The existing system of environmental taxation is not sufficiently focused on solving strategic tasks of state policy in the field of environmental development.

Environmental tax policy in Ukraine does not sufficiently develop approaches to tax incentives to introduce environmental innovations and environmental safety. The system of environmental taxation in Ukraine needs to be significantly improved to fulfill its functions as an environmental tax.

To achieve the set benchmarks in the environmental sphere, it is necessary to ensure the targeted and effective use of funds from the environmental tax and improve the mechanisms for spending funds from environmental tax and environmental measures financing. Creating a tax and non-tax instruments system could stimulate the modernization of enterprises' production-"polluters" and increase environmental payment rates, considering possible negative consequences. State environmental policy should reduce the level of environmental pollution without causing a decrease in enterprises' level of business activity.

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