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*Samusevych Yaryna, Horodetska Maryna***ENVIRONMENTAL TAXATION IMPACT ON THE DEVELOPMENT OF UKRAINIAN
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The article reveals the main directions of influence of environmental taxation of enterprises in the mining industry. Using the correlation matrix, the relationship between resource taxation and financial indicators of their activity, as well as indicators of pollution and financing of protection by companies in the mining sector is determined. A complex of one-factor regression models was built to assess the impact of environmental taxes on the development of the mining industry. It is proposed to implement in Ukraine certain tax stimulating tools that are the most successful in the EU countries, so that environmental taxes stimulate investment and innovation activities in the field of environmental protection. The purpose of the article is to investigate the main areas of positive and negative impact of resource taxation on companies in the mining sector, as well as search for ways to improve environmental taxation, based on the experience of foreign countries. As a result of the conducted research by the methods of regression analysis, the impact of resource taxation on certain indicators of the mining activity in Ukraine was established. The obtained results indicate that the environmental tax is quite limited and has no potential to influence the analyzed indicators, instead, the rent fee has a good impact potential. Thus, the practical significance of the conducted research concerns to the development of recommendations regarding the mechanism of resource taxation the introduction of relevant tax incentive tools in Ukraine. These and many other measures will contribute to environmental taxes stimulating investment and innovation activities in the field of environmental protection. By the way, they are a means and a method for solving the problem of redistribution of funds in the direction of increasing the financing of programs aimed at rational use of nature and preservation of the quality of the natural environment.

Keywords: mining industry, resource taxation, environmental impact, environmental tax, rent fee, waste, emissions.

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Introduction and formulation of the problem

The rapid development of global production systems, in particular in the 21st century led to the aggravation of the problem of responsible storage and renewal of the world's resource potential. The relevance of this issue is becoming more and more important, namely in Ukraine, whose economy is characterized by a significant level of resource- and energy-intensive industries, outdated equipment, and a low level of use of innovations. The country's policy on resource taxation is one of the economic

management tools, allowing at the same time to solve issues related to the formation of funds of financial resources and the restoration of the environment, as well as the limitation of environmentally harmful activities. In addition, the application of environmental taxes will encourage business entities to renew production and technical bases and introduce non-threatening technologies. On the other hand, efficiency of the regulatory instruments is measured by the complex impact on the object of regulation. In case of environmental taxation their

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efficiency consists in the balancing of scales of regulated activity and providing additional financial source to state and local budget for future financing environmental protection. Ukrainian system of environmental taxation is not much diversified. This provides a necessity to complex assessment their efficiency and ground the measures to improve it in terms of the maximum effects ensuring.

Analysis and research of publications

The study of various aspects of environmental taxation was conducted by such Ukrainian scientists as: O.V. Budko [1], Yu.P. Kolbushkin [2], L.L. Lazebnyk and L.P. Gatska [3], and foreign scientists: O. Esen [4], T. Vandyk [5], V. Weslati [6], C. Tan [7], A. E. Liu [8] and others. In addition, a significant number of researchers devote their work to the issues of legislative regulation of the types and standards of tax payments during hydrocarbon extraction, the impact of the tax burden on the economy of specific enterprises, and the search for ways to optimize profitability and the level of tax payments. At the same time, the issues of stimulation of economic entities engaged in the development of depleted oil and gas fields, especially at its final stage, and ensuring state interests in the effective use of available reserves remain problematic and require detailed study. Therefore, the problems that exist in the field of environmental taxation require further research and resolution, which will contribute to the greening of social production.

Purpose of the article

The purpose and objectives of the article is an investigation of environmental taxation impact on the mining industry functioning to ground the directions of the improvement of the regulatory efficiency of environmental taxation, considering the experience of foreign countries.

Presentation of the main material

The mining industry is the basis for manufacturing industries, so it is important in the Ukrainian economy. The state and development of the mining industry is closely related to the entire country’s economy. Due to its geographical location, Ukraine is among the leaders of mining countries in terms of production large volumes of minerals, the surplus of which is exported. The agreement with the European Union and the entry into force of the Free Trade Zone created conditions for economic development in Ukraine. The level of the mining industry development can be assessed through its contribution to GDP. Comparing GDP from 2010 to 2021, it grew by 16.2% annually on average [9]. However, the share of the mining industry comparing 2010–2020, decreased from 5.7% to 4.5% (Fig. 1).

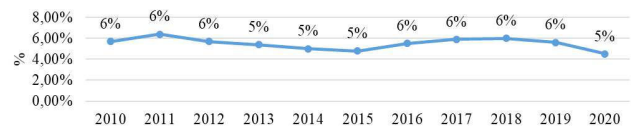


Fig. 1. Dynamics of the share of the extractive industry in the GDP structure for 2010–2020

Source: authors’ development according to data [10]

It can be assumed that the indicators will show a downward trend. After all, since 2014, in connection with the military conflict in the east of the country, the annexation of the territory of the Autonomous Republic of Crimea and the full-scale war in 2022, the mining industry has lost its positions, therefore the study of the analysis of the mining industry is especially relevant at the current stage of the economic development of the country.

Today, 117 types of minerals are present in the bowels of Ukraine out of 120 that are consumed in the world. Our country is rich in titanium, manganese, iron, germanium, kaolin, gallium and zirconium and is one of the leaders in terms of their reserves, but the greatest economic importance is hard coal, oil, gas, iron and manganese ores, stone sodium and potassium salts, non-metallic building materials, etc. According to the Register of Large Taxpayers for 2022, the largest amount of taxes in terms of the extractive industry was paid by Naftogaz of Ukraine, which produces about 90% of oil and gas in Ukraine. In addition, this list includes several other mining enterprises, including: JSC “Ukrgezvydobuvannya” (mining of natural gas), PJSC “Uknpafta” (mining of crude oil), PJSC “Poltava Mining and Processing Plant” (mining of iron ores), PJSC “DTEK Pavlogradvugillia” (hard coal mining) and others [11].

However, to investigate the development of the mining industry in Ukraine, it is necessary to first analyze the volume of mineral extraction. Considering Fig. 2, we can observe how mineral

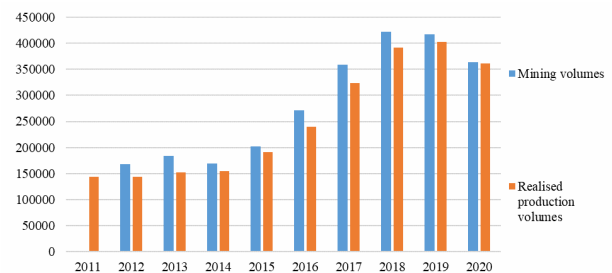


Fig. 2. Dynamics of volumes of mineral extraction and sold industrial products of enterprises in the extractive industry of Ukraine for 2011–2020, UAH mln

Source: authors’ development according to data [11]

extraction gradually increased during 2012–2018, and then the indicator decreased until 2020, but not critically, however, in general, over the entire analyzed period, it increased by 116.9%, which is a positive phenomenon.

Looking at the graph, we can say that on average the volume of mining increased by 10.2% annually, and the volume of sold industrial products (goods, services) in 2020 compared to 2011 increased by 151.6%, and on average increased by 10.8% annually. The maximum value was recorded in 2019, and the minimum value was recorded in 2011. The reason for such high indicators is the influence of investment activity because the mining industry is one of the most attractive industries in Ukraine for foreign and domestic investors. They are satisfied with cheap labor and geographical proximity to the European market. However, among the reasons for the slight decline in indicators in 2020 is the COVID-19 pandemic.

According to the Report of the Ministry of Economy of Ukraine, the drop in production indicators in the mining industry (minus 3% in January 2020 compared to the previous year) occurred due to a decrease in demand for coal from thermal power plants in the conditions of repair work and technical re-equipment at individual power plants projects, as well as a high level of natural gas reserves in underground storage facilities. In turn, the depletion of existing gas and oil deposits and coal mines restrained the development of the industry. In addition, the report also stated a decline of 4.0% in January 2021 after the growth in December 2020 (by 5.3%). This happened in the context of systemic negative factors, intensified by the effect of the January lockdown, which led to a slowdown in production activity [12].

A general analysis of the dynamics of financial results, added value based on production costs and capital investments of enterprises for several years makes it possible to understand not only the general availability of profit (loss), but also to determine the development trends of the selected industry (growth, decline) (Fig. 3). In addition, capital investments, as evidenced by world practice, are an important catalyst for production, the foundation for the stable economic rise of enterprises, as well as the country's economy.

Fig. 3 shows that financial results have had a slight decline since 2012, but 2015 was the impetus for the growth of the indicator for 4 years in a row, but in 2020, a decline in dynamics was recorded due to the COVID-19 pandemic. However, in 2020 compared to 2011, this indicator increased by 90.4%,

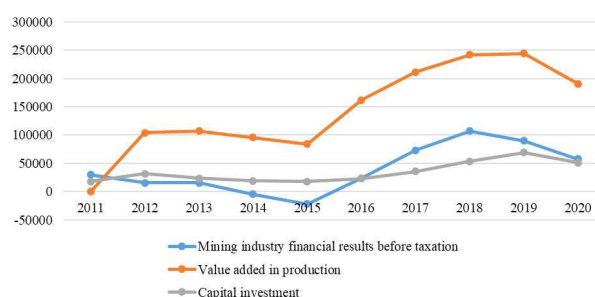


Fig. 3. Dynamics of financial results before taxation, added value based on production costs and capital investments of enterprises in the mining industry of Ukraine for 2011–2020, UAH mln

Note: For the years 2011–2013, the data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014–2020, without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source: authors' development according to data [10]

which indicates the efficiency of the mining industry of Ukraine.

The added value by production costs logically goes in parallel with the indicators of financial results, and in 2020, compared to 2012, it increased by 83.2%, that is, it grew by 7.9% annually. In addition, the maximum value was observed in 2019, and due to the impact of the pandemic, the indicator began to fall. A high level of added value becomes a necessary condition for enterprises in this industry to achieve sustainable and long-term business success and is also one of the key factors of competitiveness both in the domestic and foreign markets.

As we can see, during 2011–2016, capital investments had a rather low and constant value, because the process of attracting capital investments to the economy of Ukraine to the mining industry, was rather inhibited by the influence of the political and economic crisis. On average, capital investments grew by 12.5% annually, but this, as it turned out, was not enough, as inflationary processes intensified in the country. In addition, to a large extent, the restraint of the investment process in Ukraine is caused by corruption of state authorities, a high tax burden, and an imperfect legal framework, primarily in the area of investor rights protection.

The State Statistics Service of Ukraine publishes open statistical data on the impact of the mining industry on the environment and the implementation of environmental protection measures (Table 1). It is interesting that, despite the decrease in the volume of production in 2020, the amount of waste generated and removed to specially designated places and

Table 1

Indicators of environmental pollution by enterprises of the extractive industry of Ukraine during 2011–2022 (thousand tons)

Indicator/Year	Volume of generated waste	Volume of disposed waste	Volume of incinerated waste	The amount of waste removed to specially designated places and objects	The total amount of waste accumulated during operation in specially designated places and objects
2011	443795.5	153368.2	1039.2	251352.0	14372055.1
2012	446716.9	143110.3	1201.1	263562.6	14856638.5
2013	445262.1	146733.1	917.9	264665.6	15111636.2
2014	355000.4	109280.1	944.7	203698.0	12205388.8
2015	312267.6	92463.7	1134.7	152295.0	12505915.8
2016	295870.1	84630.3	1106.1	157379.3	12393923.1
2017	366054.0	100056.3	1064.3	169801.6	12442168.6
2018	352333.9	103658.1	1028.6	169523.8	12972428.5
2019	441516.5	108024.1	1059.0	238997.2	15398649.4
2020	462373.5	100524.6	1008.0	275985.3	15635259.6

Note: For the years 2011–2013, the data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014–2020, without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source: authors' development according to data [10]

facilities and, accordingly, the total amount of waste accumulated during operation in specially designated places and facilities increased. However, in 2020, such indicators as the volume of disposed and incinerated waste decreased.

So, in 2020 compared to 2011 the amount of generated waste increased by 18,578 thousand tons or by 4.2%. The maximum increase was observed in 2019 (89,182.6 thousand tons), but the minimum was recorded in 2014 (–90,261.7 thousand tons). On average, this indicator increased by 0.5% annually. Such an indicator as the volume of disposed waste in 2020 compared to 2011 decreased by 52843.6 thousand tons or by 34.5%. The maximum increase was in 2017 (15,426 thousand tons), and the minimum was in 2014 (–37,453 thousand tons). So, on average, annual income decreased by 4.6%. A similar situation occurred with the indicator of the amount of incinerated waste. In 2020, compared to 2011, it decreased by 31.2 thousand tons or by 3%. Therefore, the maximum increase was noted in 2015 (190 thousand tons), but the minimum – in 2013 (–283.2 thousand tons). On average, the volume of incinerated waste decreased by 0.3% annually. The analysis of the indicators shows the conscious handling of waste.

However, a different trend was shown by the amount of waste removed to specially designated places and objects, namely, in 2020 compared to 2011, it increased by 9.8%. In addition, the total amount of waste accumulated during operation in specially designated places and objects in 2020 compared to 2011 also increased by 8.8%. Therefore,

extractive enterprises should be more responsible with the generation of waste and optimize the process of their disposal.

In addition, we will separately analyze the volumes of emissions into the atmospheric air by stationary sources of pollutants and carbon dioxide (Fig. 4).

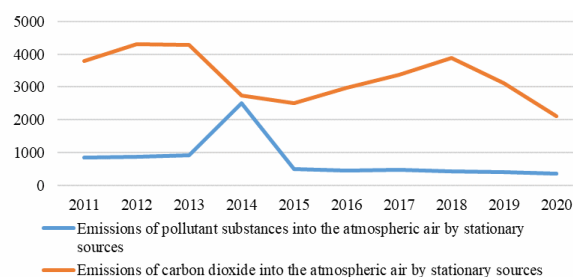


Fig. 4. Dynamics of emissions into the atmosphere by stationary sources of pollutants and carbon dioxide during 2011–2020, t thousand

Note: For the years 2011–2013, the data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014–2020, without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source: authors' development according to data [10]

The largest volume of emissions of polluting substances was recorded in 2013 according to the data of the State Statistics Service, Donetsk, Dnipropetrovsk, and Luhansk regions had significant indicators of emissions of such substances by

stationary sources of pollution. However, in general, this indicator gradually decreased during 2011–2020, and in 2014 there was a noticeable decline. This phenomenon can be explained by the fact that since 2014, the statistical data of parts of the occupied territories of the eastern regions of Ukraine are not considered due to the armed aggression of the Russian Federation, the change in the structure of export and production of industrial products.

Carbon dioxide is a natural component of the atmosphere, but it has greenhouse properties, so it helps retain heat on the Earth's surface and makes the main contribution to global warming. In 2012, the maximum value of the indicator of emissions of this type of substance was recorded, the leaders were such regions as: Donetsk, Luhansk, Zaporizhzhya and Kharkiv regions. Thus, emissions increased during 2011-2013, but fell sharply in 2014, and decreased during the year due to events in the east of the country. However, the state of the mining industry stabilized, hence, the volumes of mining increased until 2018, and this entailed an increase in carbon dioxide emissions, approximately to the same level as in 2011.

However, in 2018, the volume of carbon dioxide emissions into the atmosphere began to decrease. This is explained by the fact that during this period the Cabinet of Ministers of Ukraine approved the “Strategy of low-carbon development of Ukraine until 2050” [13]. The strategy establishes the need to separate economic growth and social development from the problem of growing greenhouse gas emissions.

In addition, the European Industrial Strategy [14] was adopted in 2019, which provides for the modernization of energy-intensive industries, the reduction of greenhouse gas emissions, and the creation of carbon control tools. This strategy has created a basis for national and corporate long-term policies that provide for carbon-free development.

Thus, at the end of 2019, the Law of Ukraine “On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions” was adopted [15]. In order to implement the provisions of this law, the Cabinet of Ministers of Ukraine adopted the following resolutions: “On approval of the list of activities, greenhouse gas emissions as a result of which are subject to monitoring, reporting and verification”, “On approval of the procedure for monitoring and reporting on greenhouse gas emissions” and “On approval of the procedure for verification of the operator’s report on greenhouse gas emissions” [15].

Also in 2020, the legislation of Ukraine was

updated on the simplification of attracting investments and the introduction of new financial instruments, namely the introduction of green bonds [16] as a separate subtype of securities. The specified instrument contributes to the creation of conditions for attracting funds to environmental projects aimed at reducing emissions into the atmosphere and modernization in accordance with the goals of the adopted strategy.

In addition, during this period, the project of the National Action Plan on Energy Efficiency until 2030 was updated [17], which determine the introduction of financial incentives for industrial enterprises, the modification of the tax on carbon dioxide emissions, as well as the use of funds collected at the expense of the tax on carbon dioxide emissions, for soft loans for measures to improve energy efficiency. According to this document, on July 30, 2021, the government approved a new climate goal for Ukraine, which requires reducing greenhouse gas emissions to 35% by 2030 compared to 1990. In addition, the Strategy for Environmental Security and Adaptation to Climate Change was adopted for the period up to 2030 [18].

Therefore, such actions on the part of the government are evaluated positively, because concrete goals and steps to overcome problems with large volumes of emissions are visible. In this regard, within the framework of the fulfillment of the terms of the Paris Agreement and Ukraine’s goals for reducing greenhouse gas emissions, some companies in the extractive industries have taken the goal of technological implementation of innovative solutions for economic growth and reduction of greenhouse gas emissions into the atmosphere.

Important for the analysis of the development of the extractive industry of Ukraine in the aspect of taxation are the volumes of tax revenues from the environmental tax and rent for the use of subsoil for the extraction of minerals (Fig. 5).

Considering Fig. 5, it should be noted that the average value of tax revenues from the environmental tax from 2012 to 2021 was UAH 4,632.42 million. Therefore, on average, this indicator grew by 8.7% annually. However, the average value of rent for the use of subsoil for the extraction of minerals for the same period amounted to UAH 38,121.59 million, which grew by 43.1% on average annually. The constant increase in revenues from the environmental tax can be explained by the growth of environmental tax rates, which have been constantly increasing throughout the entire period of the tax’s existence.

Let’s move on to the analysis of costs for environmental protection of enterprises in the

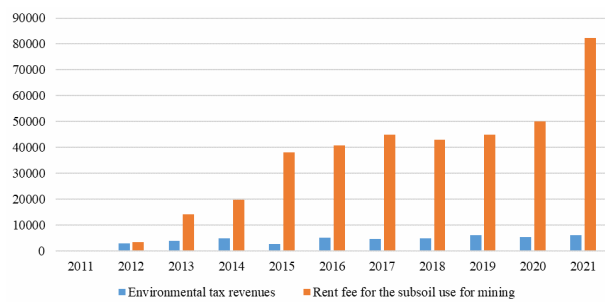


Fig. 5. Volumes of tax revenues from the environmental tax and rent payment for the subsoil use for the mining industry of Ukraine, UAH mln

Note: For the years 2011–2013, the data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014–2020, without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source: authors’ development according to data [10]

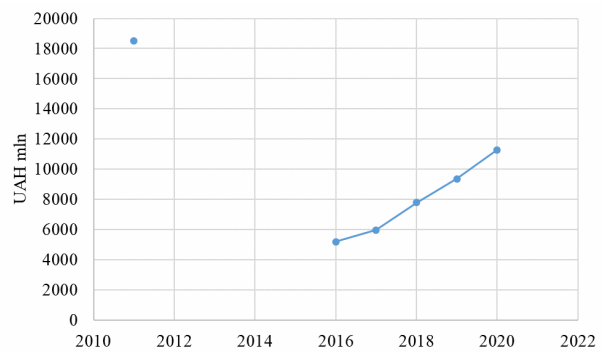


Fig. 6. Dynamics of costs for environmental protection of enterprises in the extractive industry of Ukraine for 2011–2020

Note: For the years 2011–2013, the data are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, for 2014–2020, without a part of the temporarily occupied territories in the Donetsk and Luhansk regions

Source: authors’ development according to data [10]

extractive industry of Ukraine for 2011–2020 (Fig. 6).

Analyzing on the graph the value of the indicator of costs for environmental protection, we can say that in 2020, compared to 2011, it decreased by 38.9% (7200.8 million UAH). It should be noted that in the period 2012–2015 and in 2021, the data is unknown, however, it is known that the maximum increase in the indicator was observed in 2016 (5192.8 million UAH), and the minimum – in 2012 (–18490.7 million UAH). Thus, on average, it annually decreased by 5.3%.

To assess the impact of environmental and resource taxes on the development of the mining industry, a complex of univariate regression dependencies was constructed. Factor variables of the model became indicators of tax revenues from the environmental tax or from rent payments.

Performance indicators are indicators of the development of the extractive industry of Ukraine.

First, the impact of resource taxation on the financial performance of mining companies was analyzed because they are used to characterize their financial structure (Table 2).

The evaluation results proved that the built model for assessing the impact of environmental taxes on the financial results of mining companies is adequate. According to Table 2, it can be concluded that the impact of the environmental tax is quite significant. Thus, the increase in revenues from environmental taxes by UAH 1,000 is associated with the increase in financial results by UAH 26 million, added value by UAH 43 million, mining volumes by UAH 69 million, the volume of sold products by

Table 2

Results of the assessment of the impact of resource taxes on the financial performance of mining companies in Ukraine

Resultant variable of the model	Factor variable of the model			
	Ecological tax		Rent for mining	
	Impact factor	Adequacy parameters of model ¹	Impact factor	Adequacy parameters of model ¹
Financial results before taxation	26.5235**	6.06 (0.0434)	1.51803*	3.29 (0.1128)
Added value based on production costs	43.29925**	9.86 (0.0164)	2.809869**	7.52 (0.0289)
Mining volumes	69.20274**	8.09 (0.0249)	5.322622***	14.00 (0.0072)
Volume of realized industrial products	69.99243**	8.39 (0.0231)	5.463964*	16.20 (0.0050)
Number of employed workers	-61.00864**	6.57 (0.0373)	-5.650029	48.20 (0.0002)
Capital Investments	10.52493*	5.53 (0.0509)	0.5575376	2.47 (0.1604)

Note: ¹ – Fisher’s test (prob > F value is presented in parentheses); *** – statistical significance level 99%; ** – 95%; * - 90%

Source: authors’ calculations based on data [10]

almost UAH 70 million, as well as capital investments for 10 million hryvnias.

On the contrary, the rent has a rather lower impact on the activity indicators of mining companies the growth of income from the rent relates to the growth of the above-mentioned categories by UAH 1-5 million. However, the most significant impact on income from rent is the volume of extraction. In addition, the increase in revenues from analyzed taxes by UAH 1,000 is due to a decrease in the number of employees, but this is not critical.

Now it is necessary to analyze the elements of environmental taxes in accordance with their possible correlation with indicators of environmental pollution during 2011-2020 (Table 3).

Analyzing the impact of environmental tax and rent on environmental pollution indicators, the statistical significance of the equation is not confirmed. It was established that in the studied

situation their general change does not depend on the change in the amount of revenue from resource taxes. The next stage of the research is the analysis of the impact of these taxes on the indicators of environmental protection financing by extractive enterprises of Ukraine for the period 2011–2020 (Table 4).

According to the obtained results, the statistical significance of the equation is also not confirmed. Thus, it was established that the overall change in environmental protection financing indicators was not caused by the change in environmental tax revenues at all. However, in some way, the dependence between income from rent and expenses for the protection of the natural environment and the capital investments included in them is traced.

Thus, the conducted regression analysis made it possible to establish the impact of resource taxation on certain indicators of the activity of the extractive

Table 3

Results of assessment of the impact of resource taxes on indicators of environmental pollution as a result of the activities of mining companies in Ukraine

Resultant variable of the model	Factor variable of the model			
	Ecological tax		Rent for mining	
	Impact factor	Adequacy parameters of model ¹	Impact factor	Adequacy parameters of model ¹
The total amount of waste accumulated during operation in specially designated places and facilities	204.7512	0.18 (0.6849)	-11.95051	0.13 (0.7318)
Volumes of emissions into atmospheric air of pollutants by stationary sources of pollution	-0.0465883	0.04 (0.8427)	-0.0234668	3.32 (0.1114)
Volumes of emissions into the atmospheric air of carbon dioxide pollution by stationary sources	-0.2225863	0.85 (0.3869)	-0.0288455*	4.34 (0.0757)

Note: ¹ – Fisher’s test (prob > F value is presented in parentheses); *** – statistical significance level 99%; ** – 95%; * – 90%
Source: authors’ calculations based on data [10]

Table 4

Results of assessment of the impact of resource taxes on environmental protection financing indicators by mining companies in Ukraine

Resultant variable of the model	Factor variable of the model			
	Ecological tax		Rent for mining	
	Impact factor	Adequacy parameters of model ¹	Impact factor	Adequacy parameters of model ¹
Costs for environmental protection	2.945571	2.21 (0.2340)	0.6095168*	7.49 (0.0715)
Capital investment in environmental protection costs	0.9387241	0.69 (0.4667)	0.3313048**	33.51 (0.0103)

Note: ¹ – Fisher’s test (prob > F value is presented in parentheses); *** – statistical significance level 99%; ** – 95%; * – 90%
Source: authors’ calculations based on data [10]

sector of Ukraine. The obtained results indicate that the environmental tax is quite limited and has no potential to influence the analyzed indicators, instead, the rent still has a good impact potential.

Conclusions

During the conducted research, it was established that the current mechanism of environmental tax does not stimulate business entities to reduce the volume of emissions of polluting substances. Therefore, in order to solve this problem, it is possible to rely on the experience of the EU countries and introduce certain tax incentives in Ukraine, namely:

- compensation of a significant part of tax costs (up to 80%) in case of implementation of energy-saving technologies and energy management system;
- “hyperamortization” of the latest technologies to reduce the negative impact on the environment (up to 270% of the value of assets);
- partial refund of tax or exemption from its payment, in case of implementation of resource-efficient technologies;
- reduction of the tax burden on the wage fund;
- overall reduction of tax pressure on business.

These and many other measures are used by foreign countries for environmental taxes to stimulate investment and innovation activities in the field of environmental protection. In addition, they are a means and a method for solving the problem of redistribution of funds in the direction of increasing the financing of programs aimed at rational use of nature and preservation of the quality of the natural environment. On the other hand, in Ukraine, these taxes perform only the role of fiscal orientation of the resource payment collection system.

The foundations of such legislation have already been created in our country, but they need further improvement. However, the growth of the tax burden and the regulation of the sale price of products do not make it possible to replace outdated technologies of mining enterprises and compete in the domestic market due to the excessive amount of overhead operating costs.

Therefore, it is necessary to approach the solution of this problem, setting as a goal not only the fight against environmental pollution, but also to apply a new comprehensive approach to the greening of economic development, which involves the introduction of a system of measures to reduce the burden on the environment.

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REFERENCES

1. Budko, O. V. (2015). Udoskonalennia ekologichnoho opodatkovannia yak skladova staloho rozvytku pidprijemstva [Improvement of environmental taxation as a component of sustainable development of the enterprise]. *Ekonomichna nauka. Investytsiï: praktyka ta dosvid –Economics. Investments: practice and experience*, 22, 46–50 [in Ukrainian].
2. Kolbushkin, Y. P. (2016). Znyzhennia podatkovoho navantazhennia na naftovydobuvni pidprijemstva yak factor pidvyshchennia rivnia ekonomiky kraïiny [Lowering the tax burden on oil and gas production enterprises as a factor in raising the level of the country's economy]. *Naftova galuz Ukrainy – Oil industry of Ukraine*, 2, 3–4 [in Ukrainian].
3. Lazebnyk, L. L., & Gatska, L. P. (2016). Vplyv ekologichnoho rehuliuwannia na konkurentozdatnist pidprijemstv hirnycho-dobuvnoïi promyslovosti [The impact of environmental regulation on the competitiveness of enterprises in the mining industry]. *Ekonomichniy buleten – Economics bulletin*, 1, 138–146 [in Ukrainian].
4. Esen, O., Yeldərəm, D.C., & Yeldərəm, S. (2021). Pollute less or tax more? Asymmetries in the EU environmental taxes – Ecological balance nexus. *Environmental impact assessment review*, 91, 106662. DOI: <https://doi.org/10.1016/j.eiar.2021.106662> [in English].
5. Vandyck, T., & Van Regemorter, D. (2014). Distributional and regional economic impact of energy taxes in Belgium. *Energy policy*, 72, 190–203. DOI: <https://doi.org/10.1016/j.enpol.2014.04.004> [in English].
6. Oueslati, W. (2015). Growth and welfare effects of environmental tax reform and public spending policy. *Economic modelling*, 45, 1–13. DOI: <https://doi.org/10.1016/j.econmod.2014.10.040> [in English].
7. Tan, Z. (2022). An overview on implementation of environmental tax and related economic instruments in typical countries. *Journal of cleaner production*, 330, 129688. DOI: <https://doi.org/10.1016/j.jclepro.2021.129688> [in English].
8. Liu, A. A. (2013). Tax evasion and optimal environmental taxes. *Journal of environmental economics and management*, 66(3), 656–670. DOI: <https://doi.org/10.1016/j.jeem.2013.06.004> [in English].
9. Valovy vnutrischnii product (2002-2021) [Gross domestic product (2002-2021)]. *index.minfin.com.ua*. Retrieved from <https://index.minfin.com.ua/ua/economy/gdp/> [in Ukrainian].
10. Sait Derzhavnoi sluzhby statystryky Ukrainy [Site of State statistics of Ukraine]. *ukrstat.gov.ua*. Retrieved from <https://ukrstat.gov.ua/>. [in Ukrainian]

11. Sait Derzhavnoi podatkovoi sluzhby Ukrainy [Site of State Tax Service of Ukraine]. *tax.gov.ua*. Retrieved from <https://tax.gov.ua/>. [in Ukrainian]

12. Ohliad ekonomichnoii aktyvnosti [Review of economic activity]. *www.me.gov.ua*. Retrieved from <https://www.me.gov.ua/?lang=uk-UA> [in Ukrainian].

13. Stratehiia nyzkovuhletsevoho rozvytku Ukrainy do 2050 roku: vid 18.07.2018 [Low-carbon development strategy of Ukraine until 2050: from 18.07.2018]. (2018). *mepr.gov.ua*. Retrieved from <https://mepr.gov.ua> [in Ukrainian].

14. European industrial strategy. European Commission. (n.d.). *ec.europa.eu*. Retrieved from https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en#documents [in English].

15. Sait Verkhovnoi Rady Ukrainy [Site of Verkhovna Rada of Ukraine]. *rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/> [in Ukrainian].

16. Pro vnesennia zmin do deiiakykh zakonodavchikh aktiv Ukrainy schchodo sproschchennia zaluchennia investytsii ta zaprovadzhennia novykh finansovykh instrumentiv: Zakon Ukrainy vid 19.06.2020 №738-IX [On making changes to some legislative acts of Ukraine regarding the simplification of investment attraction and the introduction of new financial instruments: Law of Ukraine №738-IX from 19.06.2020]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/738-IX#Text> [in Ukrainian].

17. Pro natsionalnyi plan dii z enerhoefektyvnosti na period do 2030 roku: rozporiadzhennia Kabinetu Ministriv Ukrainy vid 29.12.2021 №1803-p [On the National Energy Efficiency Action Plan for the period until 2030: Order of the Cabinet of Ministers of Ukraine №1803-p from 29.12.2021]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/1803-2021-p#Text> [in Ukrainian].

18. Pro skhvalennia Stratehii ekolohichnoii bezpeky ta adaptatsii do zminy klimatu na period do 2030 roku: rozporiadzhennia Kabinetu Ministriv Ukrainy vid 20.10.2021 №1363-p [On the approval of the Strategy for Environmental Security and Adaptation to Climate Change for the Period Until 2030: Decree of the Cabinet of Ministers of Ukraine №1363-p from 20.10.2021]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/1363-2021-p#Text> [in Ukrainian].

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ВПЛИВ ЕКОЛОГІЧНОГО ОПОДАТКУВАННЯ НА РОЗВИТОК ДОБУВНОЇ ГАЛУЗІ УКРАЇНИ

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У статті виявлено основні напрями впливу ресурсного оподаткування підприємств видобувної галузі. За допомогою кореляційної матриці визначено взаємозв'язок між ресурсним оподаткуванням і фінансовими показниками діяльності, а також показниками забруднення і фінансування охорони компаніями видобувного сектора. Побудовано комплекс однофакторних регресійних залежностей для оцінювання впливу екологічних та ресурсних податків на розвиток видобувної галузі. Запропоновано впровадити в Україні певні податкові стимулюючі інструменти, які можна запозичити в досвіді країн-ЄС, щоб екологічні податки стимулювали інвестиційно-інноваційну діяльність у сфері охорони навколишнього природного середовища. Мета статті – дослідити основні напрями позитивного і негативного впливу ресурсного оподаткування на підприємства видобувного сектора, а також пошук шляхів удосконалення екологічного оподаткування, спираючись на досвід зарубіжних країн. У результаті здійсненого дослідження, зокрема за допомогою регресійного аналізу, встановлено вплив ресурсного оподаткування на певні показники діяльності добувної галузі України. Отримані результати свідчать, що екологічний податок є досить обмеженим та не має можливостей впливу на аналізовані показники, натомість рентна плата все одно має непоганий потенціал впливу. Таким чином, практична значущість здійсненого дослідження полягає в розробці рекомендацій щодо механізму ресурсного оподаткування, зокрема впровадження в Україні відповідних податкових стимулюючих інструментів. Ці та багато інших заходів сприятимуть тому, щоб екологічні податки стимулювали інвестиційно-інноваційну діяльність у сфері охорони навколишнього природного середовища. Між іншим, вони є засобом і методом для вирішення проблеми перерозподілу коштів у бік збільшення фінансування програм, націлених на раціональне природокористування та збереження якості навколишнього природного середовища.

Ключові слова: видобувна промисловість, ресурсне оподаткування, екологічний вплив, екологічний податок, рентна плата, відходи, викиди.

ENVIRONMENTAL TAXATION IMPACT ON THE DEVELOPMENT OF UKRAINIAN MINING INDUSTRY

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The article reveals the main directions of influence of environmental taxation of enterprises in the mining industry. Using the correlation matrix, the relationship between resource taxation and financial indicators of their activity, as well as indicators of pollution and financing of protection by companies in the mining sector is determined. A complex of one-factor regression models was built to assess the impact of environmental taxes on the development of the mining industry. It is proposed to implement in Ukraine certain tax stimulating tools that are the most successful in the EU countries, so that environmental taxes stimulate investment and innovation activities in the field of environmental protection. The purpose of the article is to investigate the main areas of positive and negative impact of resource taxation on companies in the mining sector, as well as search for ways to improve environmental taxation, based on the experience of foreign countries. As a result of the conducted research by the methods of regression analysis, the impact of resource taxation on certain indicators of the mining activity in Ukraine was established. The obtained results indicate that the environmental tax is quite limited and has no potential to influence the analyzed indicators, instead, the rent fee has a good impact potential. Thus, the practical significance of the conducted research concerns to the development of recommendations regarding the mechanism of resource taxation the introduction of relevant tax incentive tools in Ukraine. These and many other measures will contribute to environmental taxes stimulating investment and innovation activities in the field of environmental protection. By the way, they are a means and a method for solving the problem of redistribution of funds in the direction of increasing the financing of programs aimed at rational use of nature and preservation of the quality of the natural environment.

Keywords: mining industry, resource taxation, environmental impact, environmental tax, rent fee, waste, emissions.

REFERENCES

1. Budko, O. V. (2015). Udoskonalennia ekologichnoho opodatkuvannia yak skladova staloho rozvytku pidpryemstva [Improvement of environmental taxation as a component of sustainable development of the enterprise]. *Ekonomichna nauka. Investytsii: praktyka ta dosvid – Economics. Investments: practice and experience*, 22, 46–50 [in Ukrainian].
2. Kolbushkin, Y. P. (2016). Znyzhennia podatkovoho navantazhennia na naftovydobuvni pidpryemstva yak factor pidvyshchennia rivnia ekonomiky kraiiiny [Lowering the tax burden on oil and gas production enterprises as a factor in raising the level of the country's economy]. *Naftova galuz Ukrainy – Oil industry of Ukraine*, 2, 3–4 [in Ukrainian].
3. Lazebnyk, L. L., & Gatska, L. P. (2016). Vplyv ekologichnoho rehuliuвання na konkurentozdatnist pidpryemstv hirnycho-dobuvnoii promyslovosti [The impact of environmental regulation on the competitiveness of enterprises in the mining industry]. *Ekonomichnyi buleten – Economics bulletin*, 1, 138–146 [in Ukrainian].
4. Esen, O., Yəldərəm, D.C., & Yəldərəm, S. (2021). Pollute less or tax more? Asymmetries in the EU environmental taxes – Ecological balance nexus. *Environmental impact assessment review*, 91, 106662. DOI: <https://doi.org/10.1016/j.eiar.2021.106662> [in English].
5. Vandyck, T., & Van Regemorter, D. (2014). Distributional and regional economic impact of energy taxes in Belgium. *Energy policy*, 72, 190–203. DOI: <https://doi.org/10.1016/j.enpol.2014.04.004> [in English].
6. Oueslati, W. (2015). Growth and welfare effects of environmental tax reform and public spending policy. *Economic modelling*, 45, 1–13. DOI: <https://doi.org/10.1016/j.econmod.2014.10.040> [in English].
7. Tan, Z. (2022). An overview on implementation of environmental tax and related economic instruments in typical countries. *Journal of cleaner production*, 330, 129688. DOI: <https://doi.org/10.1016/j.jclepro.2021.129688> [in English].
8. Liu, A. A. (2013). Tax evasion and optimal environmental taxes. *Journal of environmental economics and management*, 66(3), 656–670. DOI: <https://doi.org/10.1016/j.jeem.2013.06.004> [in English].
9. Valovyi vnutrischnii produkt (2002–2021) [Gross domestic product (2002–2021)]. *index.minfin.com.ua*. Retrieved from <https://index.minfin.com.ua/ua/economy/gdp/> [in Ukrainian].
10. Sait Derzhavnoi sluzhby statystyky Ukrainy [Site of State statistics of Ukraine]. *ukrstat.gov.ua*. Retrieved from <https://ukrstat.gov.ua/>. [in Ukrainian]
11. Sait Derzhavnoi podatkovoi sluzhby Ukrainy [Site of State Tax Service of Ukraine]. *tax.gov.ua*. Retrieved from <https://tax.gov.ua/>. [in Ukrainian]
12. Ohliad ekonomichnoii aktyvnosti [Review of economic activity]. *www.me.gov.ua*. Retrieved from <https://www.me.gov.ua/?lang=uk-UA> [in Ukrainian].
13. Stratehiia nyzkovuhletsevoho rozvytku Ukrainy do 2050 roku: vid 18.07.2018 [Low-carbon development strategy of Ukraine until 2050: from 18.07.2018]. (2018). *mepr.gov.ua*. Retrieved from <https://mepr.gov.ua> [in Ukrainian].
14. European industrial strategy. European Commission. (n.d.). *ec.europa.eu*. Retrieved from https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en#documents [in English].
15. Sait Verkhovnoi Rady Ukrainy [Site of Verkhovna Rada of Ukraine]. *rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/> [in Ukrainian].
16. Pro vnesennia zmin do deiakykh zakonodavchikh aktiv Ukrainy schchodo sproschchennia zaluchennia investytsii ta zaprovadzhennia novykh finansovykh instrumentiv: Zakon Ukrainy vid 19.06.2020 №738-IX [On making changes to some legislative acts of Ukraine regarding the simplification of investment attraction and the introduction of new financial instruments: Law of Ukraine №738-IX from 19.06.2020]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/738-IX#Text> [in Ukrainian].
17. Pro natsionalnyi plan dii z enerhoefektyvnosti na period do 2030 roku: rozporiadzhennia Kabinetu Ministriv Ukrainy vid 29.12.2021 №1803-p [On the National Energy Efficiency Action Plan for the period until 2030: Order of the Cabinet of Ministers of Ukraine №1803-p from 29.12.2021]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/1803-2021-p#Text> [in Ukrainian].
18. Pro skhvalennia Stratehii ekolohichnoii bezpeky ta adaptatsii do zminy klimatu na period do 2030 roku: rozporiadzhennia Kabinetu Ministriv Ukrainy vid 20.10.2021 №1363-p [On the approval of the Strategy for Environmental Security and Adaptation to Climate Change for the Period Until 2030: Decree of the Cabinet of Ministers of Ukraine №1363-p from 20.10.2021]. *zakon.rada.gov.ua*. Retrieved from <https://zakon.rada.gov.ua/laws/show/1363-2021-p#Text> [in Ukrainian].