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THE NEXUS BETWEEN INTERNATIONAL TAX COMPETITIVENESS AND THE SHADOW ECONOMY: A CROSS-COUNTRIES ANALYSIS

Abstract. The article is devoted to the study of the essence and peculiarities of the growth of tax competitiveness of the country in the conditions of a significant amount of shadowing of incomes and legalization of illegally obtained funds. The object of the study is the levels of shadow economy and tax competitiveness of the country. In the paper the 5,348 publications in the Scopus database and 2,036 publications in the WoS database on tax competitiveness and 3,095 and 1,063 publications on the problems of shadowing, respectively, were analyzed. The time horizon of the research was in 1992—2021. On the basis of bibliometric analysis the main directions of research of tax competitiveness and shadowing of economy are defined, the comparative analysis of tendencies of change of quantity of publications on these questions is carried out. It is concluded that the level of research on these issues in international scientometric publications has been significantly intensified since 2003 and 2005. With the help of VOSViewer tools, the main economic categories that are most closely related to the country's tax competitiveness are identified. Based on the results of the analysis, a hypothesis about the connection between the level of tax competitiveness of the country and the shadowing of the economy was put forward. The article identifies the leading scientific journals indexed by Scopus and WoS databases, in which the most frequently published research questions. It is determined that the majority of the papers on tax competitiveness have been published in high-ranking journals in the first and second quarters. A methodical approach to assessing the relationship between tax competitiveness of the country with the level of its shadow economy is proposed. On the example of EU countries a significant negative impact of economic shadowing on the competitiveness of the country's tax system has been proven. It is concluded that the implementation of shadow schemes of concealment of income and legalization of illegally obtained income causes significant damage to the amount of tax revenues to the budget. The methodical approach to estimation of losses of the economy from shadow activity is offered in the work. According to the results of the study, measures to de-shadow the economy in the context of increasing the country's tax competitiveness are proposed, in

particular: bringing the domestic regulatory framework to the requirements of the international community, reducing corruption, reducing time spent on filing and filing tax reports, optimizing the tax burden.

Keywords: tax competition, shadow economy, state policy, money laundering, bibliometric analysis.

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ЗВ'ЯЗОК МІЖНАРОДНОЇ ПОДАТКОВОЇ КОНКУРЕНТОСПРОМОЖНОСТІ З ТІНЬОВОЮ ЕКОНОМІКОЮ: МІЖКРАЇННИЙ АНАЛІЗ

Анотація. Присвячено дослідженню сутності та особливостям зростання податкової конкурентоспроможності країни в умовах значного обсягу тінізації доходів і легалізації незаконно отриманих коштів. Об'єктом дослідження є рівні тінізації та податкової конкурентоспроможності країни. З цією метою в роботі було проаналізовано 5 348 публікацій у БД Scopus і 2 036 публікацій у БД WoS, присвячених податковій конкурентоспроможності, та 3 095 і 1 063 публікації з проблем тінізації економіки відповідно. Часовим горизонтом дослідження обрано 1992—2021 роки. На основі бібліометричного аналізу визначено основні напрями дослідження податкової конкурентоспроможності та тінізації економіки, проведено порівняльний аналіз тенденцій зміни кількості публікацій з цих питань. Зроблено висновок про суттєву активізацію рівня дослідження цих питань у міжнародних наукометричних виданнях, починаючи із 2003 і 2005 років. За допомогою інструментарію VOSViewer виділено основні економічні категорії, які найбільш тісно пов'язані з податковою конкурентоспроможністю країни. За результатами аналізу висунуто гіпотезу про зв'язок рівня податкової конкурентоспроможності країни з тінізацією економіки. Визначено провідні наукові журнали, проіндексовані базами даних Scopus і WoS, у яких найчастіше публікувались досліджувані питання. Визначено, що

більшість робіт з питань податкової конкурентоспроможності опубліковані у високорейтингових журналах, що входять до першого і другого кварталів. Запропоновано методичний підхід до оцінювання зв'язку податкової конкурентоспроможності країни з рівнем її тінзації. На прикладі країн ЄС, за результатами розрахунків, доведено суттєвий негативний вплив тінзації економіки на конкурентоспроможність податкової системи країни. Зроблено висновок про те, що реалізація тінювих схем приховування доходів та легалізація незаконно отриманих доходів завдає значної шкоди обсягам податкових надходжень до бюджету. Запропоновано методичний підхід до оцінювання втрат економіки від тінювої діяльності. За результатами дослідження запропоновано заходи детінзації економіки в контексті підвищення податкової конкурентоспроможності країни, зокрема: приведення вітчизняної нормативної бази до вимог міжнародного спільноти, зниження рівня корупції, зменшення витрат часу на оформлення і подання податкової звітності, оптимізація податкового навантаження.

Ключові слова: податкова конкурентоспроможність, тінюва економіка, державна політика, легалізація незаконно отриманих доходів, бібліометричний аналіз.

Формул: 1; рис.: 4; табл.: 4; бібл.: 21.

Introduction. Peculiarities of economic development of a large number of countries with medium and low levels of development are budget deficits, constant capital outflows, high levels of labor migration and soon. The precondition for these processes is the low efficiency of certain components of public policy, the reform of which does not ensure the formation of sustainable competitive advantages of economies over other economies, and leads to the outflow of highly skilled workers, relocation of tax bases in countries with more favorable tax conditions in terms of starting and running a business, investing money.

Ukraine's constantly growing need for financial resources highlights the need to find additional and monitor existing sources of filling the state budget, attract financial resources by increasing the country's investment attractiveness, registration and business in Ukraine by non-residents and more. One of the indicators that characterizes the country's attractiveness to international investors and business partners, the favorableness of its business environment is the level of tax competitiveness. The understanding of the governments of most countries of the world of the importance of this indicator in the implementation of international economic and investment policy necessitates the government to intensify its efforts to form a competitive advantage in the process of implementing its tax policy.

Literature review and the problem statement. Today, the definition of «tax competitiveness of the country» is characterized by inconsistent approaches to its understanding, low level of research and a wide variety of interpretations. C. Tibou [10] in his research considers the concept of tax competitiveness of local governments, which means the process of reducing the level of local government tax burden in their territories. According to the author, this concept should be equated with the tax autonomy of local governments. A sufficient level of tax autonomy allows local governments to compete for the right to register business in their territory by manipulating the size of tax rates and fees, the introduction of preferential tax regimes, exemption from taxation of certain tax bases.

D. Bradford and W. Oates [2] emphasized that along with the economic benefits, these manifestations of tax competition have a number of negative consequences for the economy. According to the authors, one of the main threats to the implementation of the measures by public authorities, in the framework of increasing tax competitiveness, is to reduce the state's ability to provide the population with a sufficient level of public goods.

A. Boyko and J. Samusevych [1], I. Tiutiunyk, O. Mazurenko [6] considered tax competition as a prerequisite for economic growth and de-shadowing of the economy. Tax-competitive jurisdictions receive significantly greater economic benefits due to more favorable conditions for business registration and profit in their territory compared to competitors. Ultimately,

this leads to a significant increase in the level of tax burden in other jurisdictions and an even greater evasion of taxes by economic entities [7].

Thus, the lack of a common understanding of the nature and role of tax competitiveness in the economic development of the country highlights the need for more detailed study of the content of this concept and its relationship with the shadow economy.

The purpose of this research is to estimate the nexus between tax competition and shadow economy.

Research results. The results of bibliometric analysis of the dynamics of changes in the number of publications on tax competitiveness and the shadow economy in the Scopus and WoS databases show its gradual growth. In 2003, the number of publications on tax competitiveness indexed by the WoS database increased significantly to 124 from 71 in 2002. A similar situation is observed in 2015 with publications on the problem of shadowing the economy in the WoS database and in 2011 — in the Scopus database. These trends are related to the actualization of the problems of permanent growth of shadow financial transactions and legalization of proceeds from crime, the adoption in 2015 by the International Labor Organization «Recommendations for the transition from informal to formal economy» (Fig. 1).

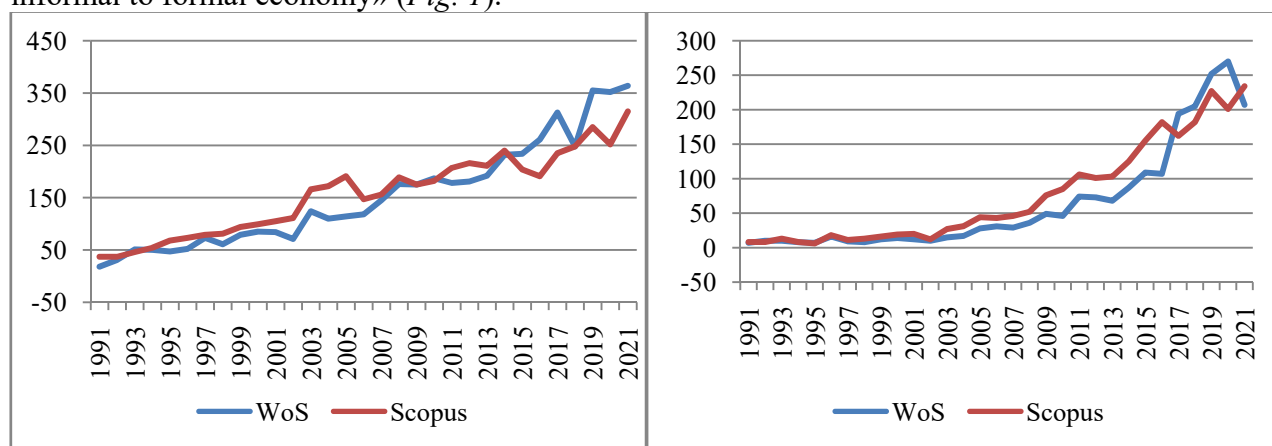


Fig. 1. Number of articles in the Scopus and WoS databases on: a) tax competitiveness and b) shadow economy

Source: compiled by the authors on the basis of the Scopus database.

According to the WoS and Scopus databases, the vast majority of publications on tax competitiveness are published in high-ranking journals in the first and second quarters (Table 1). The largest number of works (217 for the WoS database and 176 for the Scopus database) was published in International Tax and Public Finance journal.

Table 1

The top 10 Scientific Journals, indexed by Scopus / Web of Science, which published the papers on tax competition

Source title	Number of the papers		Quartile
	Web of Science	Scopus	
International Tax and Public Finance	217	176	Q1
Journal of Public Economic	210	146	Q1
Regional Science and Urban Economics	113	75	Q1
Journal of Urban Economics	92	58	Q1
National Tax Journal	87	-	Q2
Journal of Public Economic Theory	63	47	Q1
Public Choice	53	39	Q1
European Economic Review	51	40	Q1
Environmental and Resource Economics	49	40	Q1
Canadian journal of economics	46	-	Q3
Energy Policy	-	50	Q1
Public Finance Review	-	49	Q3

Sources: compiled by the authors using the Scopus and Web of Science data.

The analysis of publications on the problems of shadowing the economy allowed us to identify the top 10 journals in which these issues are most often considered. At the same time, the number of publications in these journals is significantly lower compared to issues of tax competitiveness. The ratings of the journals in which these issues are published are also much lower. Thus, only 3 of them belong to the first quarter of Q1, 4 — the second, 1 — the third and 1 — the fourth. 6 magazines do not belong to any of the quarters (*Table 2*).

Table 2

The top 10 Scientific Journals, indexed by Scopus/Web of Science, which published the papers on shadow economy

Source title	Number of the papers		Quartile
	Web of Science	Scopus	
Financial and credit activity problems of theory and practice	28	-	-
Baltic journal of economic studies	25	-	-
Sustainability	22	18	Q1
Applied economics	20	17	Q2
International tax and public finance	17	14	Q2
Actual problems of economics	14	26	-
Handbook on the shadow economy	14	13	-
Economic systems	13	-	Q2
AEBMR advances in economics business and management research	12	-	-
Journal of cleaner production	12	-	-
International Journal of Entrepreneurship and Small Business	-	13	Q2
Economic Analysis and Policy	-	13	Q1
Contributions to Economics	-	14	Q4
Journal of Public Economics	-	16	Q1
International Economic Journal	-	16	Q3

Sources: compiled by the authors using the Scopus and Web of Science data.

The results of the bibliometric analysis conducted with the help of VOSviewer tools testify to the close connection of tax competitiveness with different economic categories (*Fig. 2*).

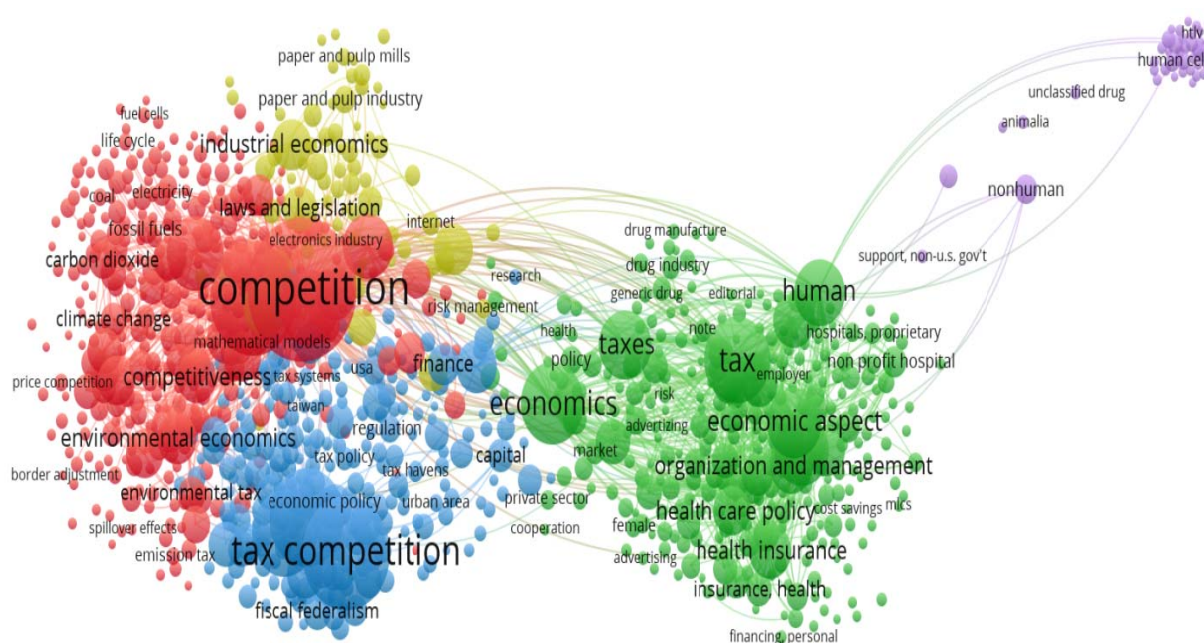


Fig. 2. Network visualization of the relationship between tax competitiveness and different economic categories

Sources: compiled by the authors using data from Scopus and WoS by VOS viewer tool.

According to the results of the analysis, a very close relationship between tax competitiveness is observed with the concept of shadowing of the economy. In order to confirm the hypothesis of the existence of this relationship, we will analyze the relationship between these indicators using the Ordinary Least Squares method. The results of the cross-country analysis are shown in *Table 3*.

Table 3

OLS test for tax competition and shadow economy

	Value	Statistic	Cons
Austria	Critical Value	1.2145	1.8542
	Prob.	0.8512***	0.1236***
Belgium	Critical Value	1.6589	0.8512
	Prob.	0.8574**	0.0658**
Bulgaria	Critical Value	0.2345	2.4012
	Prob.	0.6674*	0.1065*
Switzerland	Critical Value	0.5589	1.2547
	Prob.	0.6636**	0.9658**
Cyprus	Critical Value	1.9854	2.3025
	Prob.	2.0125**	0.4589**
Czech Republic	Critical Value	1.1268	1.4425
	Prob.	0.6284***	0.3302***
Germany	Critical Value	2.5318	2.5478
	Prob.	0.3256*	1.9305*
Denmark	Critical Value	0.5894	2.1245
	Prob.	0.5468*	0.3325*
Spain	Critical Value	0.7548	0.6589
	Prob.	0.3698**	0.5214**
Estonia	Critical Value	1.2145	2.8547
	Prob.	0.4785**	0.5689**

Source: Authors' calculations based on [13].

The results of the Ordinary Least Squares test confirmed a statistically significant nexus between tax competition and shadow economy. Thus, the de-shadowing of the economy can be considered as an effective tool to increase the level of tax competitiveness of the country.

Today, among the whole set of tools to increase the level of tax competitiveness of the country, the use of incentive tax benefits is widely used [14; 15]. Most often, these tools are used by: 1) countries with economies in transition, which have not yet completed the transition from a socialist to a market tax system and which use these incentives as an alternative to other mechanisms to withdraw funds from the shadows; 2) in developing countries, these incentives are aimed at neutralizing other short comings (low level of infrastructural development, out dated regulatory frame work, high level of bureaucracy, etc.), which stimulate economic entities to shadow activities (*Fig. 3*).

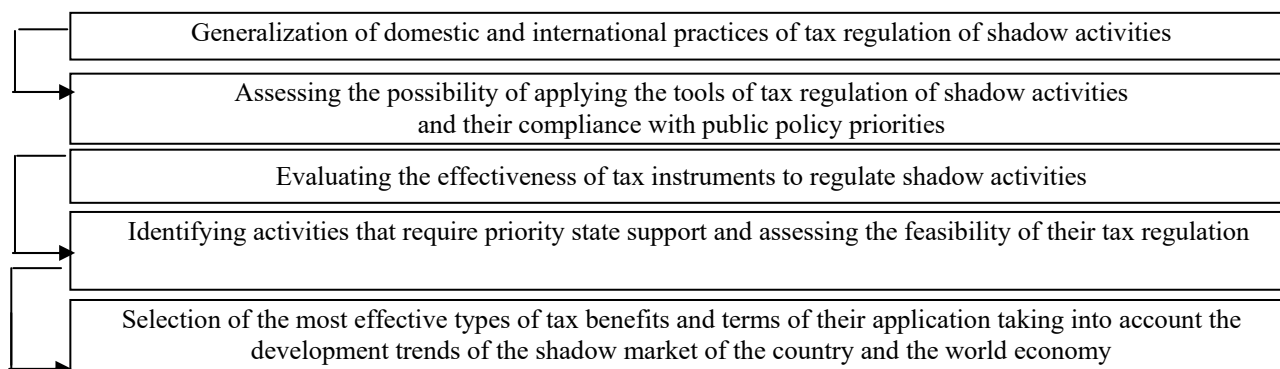


Fig. 3. Stages of selection of tax instruments to regulate the country’s shadow activities

Source: developed by the authors.

At the same time, tax incentives themselves can not serve as a catalyst for shadow activities, as the general features of the tax system (tax base, tax rates, etc.) are more important for participants in shadow operations [7; 11].

Countries with economies in transition are quite attractive for shadow with drawals. A number of their legislative provisions still correspond to the conditions of the socialist economy and do not fully correlate with the conditions of taxation of market economies.

This leads to a gap between the tax bases, which must be accrued in accordance with the standards of a market economy and actually accrued in these countries, and thus reduce the level of tax competitiveness of the country.

At the same time, the lack of a coherent and stable regulatory framework is a stimulus for the growth of shadow activities and reduce the level of tax competitiveness of the country. The main feature of the tax legislation of many developing countries and countries with economies in transition is its constant revision and amendment. This increases the risk of shadow activity in the implementation of capital-intensive projects and complicates the procedures for monitoring and controlling the movement of resources.

Despite the additional difficulties for government regulators in incurring additional costs for both the government (planning and forecasting tax revenues) and taxpayers, growing uncertainty about future tax results, their existence intensifies the flow of investment to the country to obtain additional benefits.

Thus, the reduction of shadow operations is possible due to increased control over economic entities. Given the important role of tax payments in the economic development of the country, one of the components of the roadmap for de-shadowing the economy is forecasting the amount of tax evasion from changes in the level of macroeconomic stability in the country.

The basis of this process should be the introduction of tools for estimating and forecasting the amount of tax arrears received by the budget due to the implementation of shadow schemes of tax evasion. The consequences of these actions, as a rule, have a destructive effect on the country's economic development, which is growing every year (including due to the cumulative and synergistic effect).

Fig. 4 shows the dynamics of changes in tax evasion (TI) as the difference between the total amount of uncollected tax payments and the amount of losses due to tax benefits, tax exemptions, errors and miscalculations of tax payments.

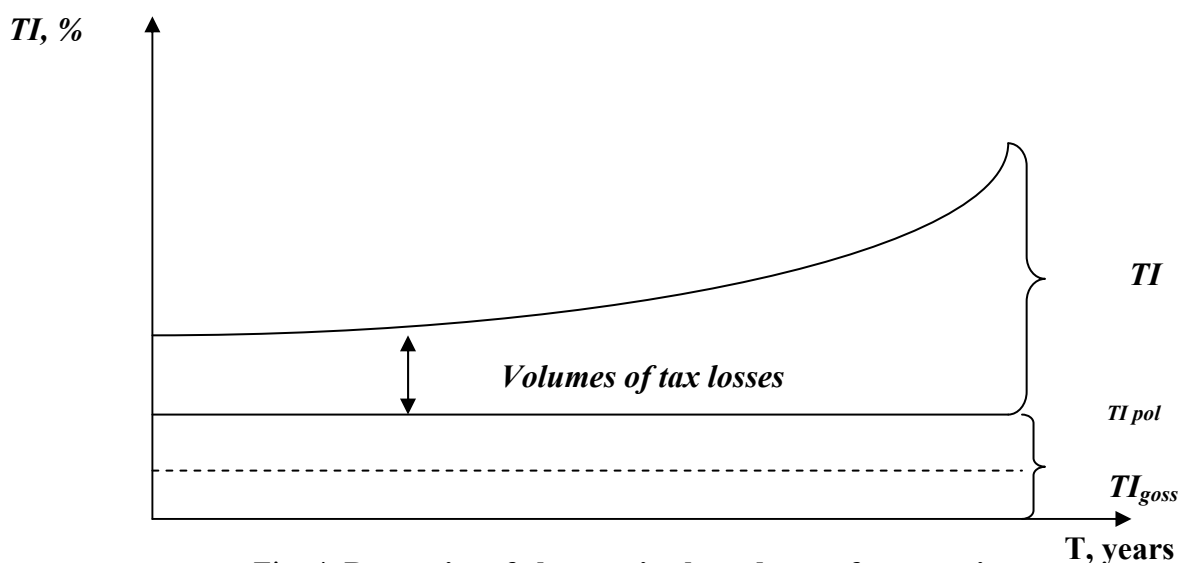


Fig. 4. Dynamics of changes in the volume of tax evasion

Source: developed by the author.

Forecasting the amount of tax losses through the use of shadow schemes can be done using a continuous function, which has the following form:

$$TI_t = TI_0 \cdot e^{\alpha T},$$

where TI_t — the amount of tax losses due to the use of shadow schemes in the period t , %;

TI_0 — the amount of tax losses due to the use of shadow schemes in the base period, %;

α — a function that reflects the impact of tax losses on the level of tax competitiveness of the country.

The α function takes into account the threats and benefits of using shadow schemes to conceal income. At the same time, according to the results of the analysis of the threat of shadowing of incomes, they are usually long-term, and the refore in the evaluation process should take into account their future value. The benefits of income shadowing due to value added in the economy by increasing employment (even in the shadow economy), GDP growth through the sale of shadow products (in the official and shadow markets) are more valuable now than in the future.

Thus, the established patterns can form the basis for determining the projected values of budget losses from the use of shadow operations and will serve as a basis for implementing the road map for de-shadowing the economy in the context of improving macroeconomic stability.

The generalization of the analyzed measures of de-shadowing of the economy carried out in *Table 4* forms the basis for the formation of a road map of de-shadowing of the economy. Their implementation will increase the level of publicity and transparency in the work of state bodies, financial monitoring and control bodies, reduce bureaucracy and corruption in the country, simplify financial monitoring and control over tax administration processes, increase the stability of the national economy by removing some illegally obtained income and, ultimately, an increase in the country's level of tax competitiveness.

Table 4

**Systematization of tools to increase the level of tax competitiveness of the country
by de-shadowing the economy**

Factors	Manifestation	Tools
Obsolete regulatory framework, contradictions of regulations	Manipulation of certain provisions of regulations	Alignment of regulations with each other, with international law, eliminating the possibility of different interpretations of certain provisions by different persons
Low level of separation of powers of individual authorities	Manipulation of their official powers, corruption	Coordinating the responsibilities of individual officials, delimiting their areas of responsibility, introducing e-government services, etc.
Low level of openness of data on the activities of public authorities	The population is not aware of the directions of spending budget funds	Increasing the level of transparency of public authorities, introduction of e-government services.
Low tax morale of the population	Not aware of the damage done to society as a result of shadow activities	Implementation of social measures that contribute to the formation of the population's responsibility for the country's development, raising the level of tax morale and tax culture of society.
Low administrative penalties for shadow activities	Impunity of economic entities for crimes committed	Strengthening administrative and criminal liability for violations of tax legislation, improving the efficiency of regulatory bodies, the judiciary, reducing the length of proceedings, reducing corruption in the judiciary.
Excessive tax burden	Excessive pressure on taxpayers forces them to use various schemes to increase their income	Optimization of the level of tax burden, bringing it in line with the realities of economic development of the country, reviewing the validity of the application of preferential tax regimes
Variability of the country's development indicators, instability of its economic and financial system	Low level of trust in the government, deterioration of the material well-being of the population	Implementation of a set of measures to ensure macroeconomic stability of the country, attract investment to the country, counteract the emergence of economic imbalances and more.

Source: developed by the authors based on [3—5; 8; 9; 12].

Conclusions. The results of the study form the basis for the development of new and improvement of existing recommendations for the prevention of the use of shadow schemes of with drawal and their further legalization in Ukraine in terms of the tax channel of shadowing the economy.

The priority measures should be: increasing the efficiency of tax and customs services by conducting impartial inspections, reducing corruption in government agencies; organization and systematization of the relationship between individual agencies by establishing cooperation between individual entities of the financial sector and government institutions; development of the system of international cooperation in the direction of prevention of participation of domestic economic entities in transnational schemes of concealment of incomes and their removal to the territory of other states; improving the procedure for calculating and paying taxes, reducing the time spent on filling out and maintaining tax reporting; strengthening the responsibility for tax evasion, including increasing the amount of material and the introduction of criminal liability for the shadowing of income in particularly large amounts in the event of damage to the state in particularly large amounts; to introduce electronic cashflow monitoring services (including through the use of artificial intelligence and machine learning), development of a methodology for identifying risky financial transactions, improving the tools for implementing the tax system, etc.

Improving the tax system can be seen as a guarantee of economic growth and development of the country, stimulating the development of certain sectors of the economy, bringing out of the shadows a significant amount of financial flows. Such measures include a review of individual vectors of taxpolicy, rates and objects of taxation, types and amounts of tax benefits, etc.

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