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**FINANCIAL POLICY
OF UKRAINE
IN THE CONTEXT OF
EUROPEAN INTEGRATION:
TRENDS OF MARTIAL STATE
AND POST-WAR REVIVAL**

Edited by **Ryszard Pukala & Viktoriia Tyschenko**

monograph

State University of Applied Sciences in Jaroslaw

Simon Kuznets Kharkiv National University of Economics

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TRENDS OF MARTIAL STATE
AND POST-WAR REVIVAL
MONOGRAPH**

Editors:

**Ryszard Pukala,
Viktoriia Tyshchenko**

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Reviewers

Doctor of Science (Economics), professor *Krupka Mykhailo*

Doctor of Science (Economics), professor *Yuliia Kovalenko*

Doctor of Science (Economics), professor *Iryna Vasylchuk*

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International Project Head

Ryszard Pukala (State University of Applied Sciences in Jaroslaw)

Editors

Ryszard Pukala – State University of Applied Sciences in Jaroslaw

Viktoriia Tyshchenko – Simon Kuznets Kharkiv National University of Economics

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PREFACE

The collective monograph is the result of the International Project “Financial policy of Ukraine in the context of European integration: trends of martial law and post-war revival” in the form of the scientific study.

The International Project was implemented in accordance with the Cooperation agreement between the Bronislaw Markiewicz State Higher School of Technology and Economics (Jaroslaw city, Poland) (now – the Bronislaw Markiewicz State University of Applied Sciences in Jaroslaw) and Simon Kuznets Kharkiv National University of Economics (Ukraine), dated November 24, 2014.

The collective monograph «Financial policy of Ukraine in the context of European integration: trends of martial law and post-war revival» is based on the results of scientific studies within the framework of the International Project, executed as part of the agreement between the Bronislaw Markiewicz State Higher School of Technology and Economics (Jaroslaw city, Poland) (now – the Bronislaw Markiewicz State University of Applied Sciences in Jaroslaw) and Simon Kuznets Kharkiv National University of Economics (Ukraine).

The monograph contains a systematic approach to the consideration of problems and consequences in the field of financial policy that Ukraine faced during the period after the beginning of the military aggression of the Russian Federation. In the sections of the monograph, the main emphasis is on the direct development of institutional ambushes of financial policy in the post-war period in the context of European integration, on achieving greater clarity and close interaction connection with the practice of strategic planning of the national economy of Ukraine. It is important to note that the monograph pays close attention to the institutional and economic-legal foundations of anti-crisis economic management based on a risk-oriented approach.

The monograph is aimed at scientists, scholars, graduate students and students of economics universities and faculties, business schools, businessmen and managers, as well as graduates, I How do they look at the nutrition of the economic strategy and the development of financial policy, including in the context of world globalization processes.

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AUTHOR CREDENTIALS

RYSZARD PUKALA (general management, scientific editor), is prof. PANS, habilitated doctor, Ph.D. (Economics), The Bronislaw Markiewicz State University of Applied Sciences in Jaroslaw, Poland. The main issues he deals with as part of the conducted research work focus on systemic risk, financial markets, identifying and managing business activity risks, using instruments aimed at financing the effects of risk materialization, with particular attention paid to insurance and the issues of innovation in the economy and enterprises. An author of many scientific publications and conference materials issued in prominent magazines as well as domestic and foreign publishing houses as well as a head of national and international research projects. Member of the Polish Economic Society.

VIKTORIYA TYSHCHENKO (subsection 2.2, volume – 1.5 author’s sheets), is Doctor of Science (Economics), Professor, Head of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics. She is a member of the editorial board of Business Inform and Youth Economic Bulletin of Simon Kuznets Kharkiv National University of Economics. Author of more than 100 scientific and educational works, many of which are devoted to the problems of interaction between public authorities and representatives of private entrepreneurship in order to improve the efficiency of activities, in particular in the context of European integration. Her research interests include the development of the knowledge economy and the use of public-private partnerships as a tool that can provide the necessary level of funding for all components of the knowledge economy (innovation, education, ICT); studying the mechanism of interaction between business and government as one of the most important conditions for successful socio-economic development in general and in particular regions).

NATALIYA VNUKOVA (subsections 3.3, volume – 1.5 author’s sheets), Honored Economist of Ukraine, is Doctor of Science, Professor, Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics, Leading Researcher of Scientific and Research Institute of Providing Legal Framework for the Innovative Development of National Academy of Law Sciences of Ukraine. Research refers to development of market for financial services, the main areas of prudential supervision, anti-money laundering (AML) and development of financial monitoring. Has been a member of the Union of Economists of Ukraine, corr.-member of the Academy of Technological Sciences of Ukraine, a member of the Union of Entrepreneurs of the Kharkiv region, member

Author credentials

of specialized council on defense of dissertations on specialty «Money, Finance and Credit», a member of the editorial «Insurance Business».

OLEH KOLODIZIEV (subsections 2.1, volume – 2.04 author's sheets), is Doctor of Science (Economics), Professor, Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics, Academician of the Academy of Economic Sciences of Ukraine on specialty of finances. Member of the editorial board of scientific journals: «Banks and Bank Systems», which is indexed in scientific base Scopus; «Economic Theory and Law». Deputy Chairman of the Academic Council Д 64.055.02 at Simon Kuznets Kharkiv National University of Economics according to specialties 08.00.07 – Demography, labor economics, social economy and politics; 08.00.08 – Money, Finance and Credit. Research interests: innovative development of national economics; ensuring the stable functioning of the banking sector; building up a regional finance policy; risk-oriented approach in the system of combating money laundering, terrorist financing and proliferation of weapons of mass destruction; compliance control of the subjects of primary financial monitoring.

OLGA RATS (subsection 2.3, volume – 1.5 author's sheets), is Ph.D. (Economics), Associate Professor, Associate Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics (Ukraine). Her research is focused on theoretical and methodological support evaluation of the efficiency of the company, assessment of the efficiency of strategic bank management, forming a strategy of crisis management banking institution, technology benchmarking as a tool to ensure the financial security of the bank, organisation of fraud monitoring in the system of bank economic security management.

SVITLANA ACHKASOVA (subsection 1.4, volume – 1.5 author's sheets), is Ph.D. (Economics), Associate Professor, Associate Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics (Ukraine). Research interests: development of the infrastructure of financial services markets on the basis of social responsibility, financial mediation, partnership relations; financial market when using digital tools; accumulative pension provision to ensure social and economic security of the state; development of the risk-oriented approach in the system of financial monitoring, study of the mechanism of development of financial and economic aspects of management of educational institutions, enterprises. Member of the editorial board «Revue Algerienne De Finances Publiques (RAFIP)», «Financial Statistical Journal. Section. Stress Testing and Risk Integration in Banks», «Development Management».

Author credentials

VIKTORIYA OSTAPENKO (subsection 3.2, volume – 0.8 author’s sheets), is Ph.D. (Economics), Associate Professor, Associate Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics (Ukraine). Published author of 200 publications and objects of intellectual property, including a textbook with innovative teaching strategies that immerse students in the learning process. Her research interests include innovative economy, stakeholder interaction, integration of education, science and business, public-private partnership, financial stability of the economic system, customs risk management, regulation of foreign economic activity in customs.

YURIY IVANOV (subsection 4.1, volume – 3.02/1.51 author’s sheets) is Honoured Economist of Ukraine, Doctor of Science (Economics), Professor, Chief Researcher of Research Center for Industrial problems of Development of the National Academy of Science of Ukraine, Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics. Has been a Academician of the Academy of Economic Sciences of Ukraine, member of the Union of Entrepreneurs of the Kharkiv region, member of Academic Council Д 64.055.02 at Simon Kuznets Kharkiv National University of Economics and Research Center for Industrial problems of Development according to specialties 08.00.04 – Economics and enterprise management and 08.00.03 – Economics and Management of the National Economy, member of Science Council of Ministry of Finance of Ukraine, member of the editorial board of scientific journals: “Finance of Ukraine”, “Problems of economy”, “Economics of development”, “Business Inform”. Research interests: development of taxation and tax policy, tax regulation, anti-crisis economic policy.

VOLODYMYR VALIHURA (subsection 4.2, volume – 0.95 author’s sheets and 4.3, volume – 0.47 author’s sheets), is Ph.D. (Economics), Associate Professor, Associate Professor of the Department of Finance named after S. I. Yuriy at West Ukrainian National University (Ukraine). Member of the editorial board of the professional scientific publication of category «B» «Scientific Bulletin of the Odessa National University of Economics». Guarantor of the educational and professional program Customs and tax affairs (bachelor’s degree) at West Ukrainian National University. Research interests: theoretical foundations and pragmatics of property taxation, taxation of business activities in the conditions of martial law and post-war recovery, harmonization of universal excise taxes, harmonization of taxation of energy products, European experience of anti-crisis tax regulation

ANATOLII LUTSYK (subsection 1.2, volume – 0.8 author’s sheets), is Ph.D in Economics, associate Professor, associate Professor of the Department of Finance

Author credentials

named after S.I. Yuriy at West Ukrainian National University (Ukraine). An author of many scientific publications and conference materials in field of fiscal policy, taxation and customs. Research interests: fiscal policy, tax policy globalization, tax regulation, harmonization of direct and indirect taxes, fiscal aspects of addressing social inequalities.

VIACHESLAV LAPTIEV (subsections 4.1, volume – 3.02/1.51 author's sheets), is Doctor of Science (Economics), Professor, Associate Professor of the Department of Social Economics at Simon Kuznets Kharkiv National University of Economics (Ukraine). The author of more than 70 articles and conference theses dedicated to people management issue. The focus of scientific research is human resources at three economic levels (micro, mezzo and macro) and specifics of its management for the enterprise, region and country as well; professional development according to the problem-oriented methodology; human resources motivation.

OLGA IVANOVA (subsections 3.1, volume – 1.53 author's sheets), is Doctor of Science (Economics), Professor, Head of the Sector of Problems of regional development and decentralization, Department of Macroeconomic Policy and Regional Development, Associate Professor, Research Center for Industrial Development Problems National Academy of Sciences of Ukraine, Professor of the Department of Management, Public Administration and Personnel of the West Ukrainian National University (Ukraine). Council Д 64.251.01 at Research Center for Industrial Development Problems National Academy of Sciences of Ukraine. The author of more than 140 articles and conference theses. Research interests: regional development; spatial development of united territorial communities; state regulation and deregulation of the economy; regulation of fiscal and budgetary relations; fiscal decentralization; financial self-sufficiency and stimulation of self-development of regions; mechanisms of tax and budgetary stimulation of the development of the real sector of the economy; regulatory policy; human resources management.

VLADA KARPOVA (subsection 1.1, volume – 1.7 author's sheets), is Ph.D. (Economics), Associate Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics (Ukraine). The author of more than 100 articles and conference theses. Research interests: fiscal policy, tax regulation, tax management, tax planning, tax policy globalization, mechanisms of tax and budgetary stimulation of the development of the real sector of the economy; fiscal decentralization; taxation of business activities in the conditions of martial law and post-war recovery, European experience of anti-crisis tax regulation, transfer pricing.

Author credentials

OLEKSII NAIDENKO (subsection 1.3, volume – 0.9 author’s sheets), is Ph.D. (Economics), Associate Professor, Associate Professor of the Department of Customs and Financial Services at Simon Kuznets Kharkiv National University of Economics (Ukraine). More than 250 scientific and methodological materials in the field of taxation and customs affairs have been published. The field of scientific interests is tax regulation, tax benefits, customs regimes, customs regulation of foreign economic activity, non-tariff methods of regulating foreign economic activity.

INTRODUCTION

The full-scale war caused significant losses and undermined Ukraine's potential. However, the consequences of the war have changed beyond the territory of Ukraine. Russia's attack has disrupted global supply chains, exacerbated geopolitical fragmentation and provoked energy supply disruptions around the world, and triggered population migration unprecedented since World War II.

Assistance to Ukraine should include not only military and humanitarian aid, but also economic and financial, political and institutional support. This is an integral part of the policy of the democratic world, which is now not only a condition for victory, but also for ensuring global protection against the influence of authoritarian terrorist regimes and will help ensure security for the whole of Europe. Assistance to Ukraine strengthens global security and the dominance of the free world, and is much less costly. Strengthening the sanctions regime against the aggressor will bring the world closer to defeating a common enemy, the influence of authoritarian regimes and resource dependence.

It is now time to consider long-term strategies for post-war reconstruction and rapid and sustainable growth. Post-war reconstruction will require a comprehensive approach, including the attraction of funding in the form of grants or long-term loans, international cooperation, structural reforms, transparency and improved public administration. The financial system plays a key role in this process during the war and post-war reconstruction. The NBU ensured the proper functioning of the financial system, kept inflation under control, and balanced the exchange rate after the start of the full-scale invasion of the country. Macro-financial stability requires understanding and development of the concept of reconstruction, intensification of European integration processes, creation of a system of guarantees and insurance against war risks.

The aggressor's full-scale attack has caused significant negative effects that extend even beyond Ukraine's borders. Given the significant level of shock and limited access to official reporting at the beginning of a full-scale war, the full range of analytical and research capabilities provided by the advances in science and technology should be used to analyse the initial impact of the Russian attack on the Ukrainian economy. Of particular relevance is the study of the peculiarities of the functioning of the financial aspects of the economy and the formation of financial policy in wartime.

Fiscal decentralization plays an important role in shaping the financial capacity of local communities, especially in the post-war period. Fiscal decentralization allows for the redistribution of budget resources between central and local authorities. This

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can support regional and local initiatives and the recovery of the economy at the community level. It promotes economic development in the regions, enabling local authorities to invest funds more effectively in infrastructure, education, healthcare, and other areas that contribute to the economic well-being of communities. It increases the accountability of local authorities in managing budget resources and the quality of public services, leading to more efficient use of budget funds. It also contributes to attracting investments, which is crucial for the recovery of territories after a war, and allows local authorities to better respond to the population's needs for social services such as education, healthcare, and social protection.

Special attention should be paid to the possibility of using in the financial policy of Ukraine both during the period of martial law and at the stage of post-war economic recovery the best European practices of the anti-crisis preferential tax policy of 2022-2023, aimed at: redistributing windfall profits of mining and energy companies; curbing the growth of energy prices, stimulating energy efficiency and energy saving in the context of the implementation of the “green transition”.

Currently, there are no in-depth studies that would highlight the optimal financial policy in the context of external military aggression of this level. The monograph is dedicated to determining the impact of the war on the economy, the directions of rapid and sustainable recovery, the priorities of post-war reconstruction, as well as strengthening the support of Ukraine by the international community and strengthening financial sanctions against the aggressor country. The monograph should contribute to solving an important issue - modernisation of existing financial instruments of support and consolidation of resources, taking into account the nature, dynamics and level of development of the war in Ukraine.

Harmonization and improving of the legislative framework is a necessary condition for the country's entry into the European Union. It is especially important to research ways of harmonizing the value added tax, which is key to the financial policy of the European Union as an integration union. Improving the administration of value added tax is even more important for the future financial policy of Ukraine. The administration and harmonization of excise duties on alcoholic beverages, tobacco and other goods recognized by the world as harmful to human health and destructive to nature also require scientific research for the purpose of minimizing it. Another reason of research is find a ways of strengthening of tax control in the EU countries and Ukraine

PART 1.
FINANCIAL POLICY IN UKRAINE IN THE CONTEXT
OF EUROPEAN INTEGRATION: RISKS AND DETERMINANTS

1.1. Fiscal anti-crisis policy in Ukraine under martial law: trends and risks

Effective counteraction to large-scale military aggression of the Russian Federation against our country requires a radical reform of the entire system of state management of the economy. The new management system must be oriented towards the implementation of fundamentally new tasks and at the same time take into account not only the new realities of the destruction of infrastructure and the economy as a whole, but also the priorities of the post-war revival of Ukraine. All this fully refers to such an important area as foreign economic activity, the state regulation of which involves the active use of economic methods of regulation with the use of customs payments.

Tax policy is one of the most effective components of state regulation of the economy. This is due, first of all, to the fact that it is directly implemented through the economic interests of economic agents, creating their interest in achieving the desired results for the country or territorial unit (region, united territorial community). The complexity of using tax policy tools is related to the bifunctional nature of taxes, since along with the regulatory function, they also perform a fiscal function, providing revenue to the national and local budgets. At the same time, excessive emphasis on tax incentives entails certain budgetary risks both in the short-term and in the long-term.

The need for effective counteraction to the large-scale aggression of the Russian Federation against Ukraine objectively requires an adequate restructuring of the entire system of state regulation of the economy, including its tax component, which must not only meet all modern challenges, but also create prerequisites for the creation of real incentives for the post-war reconstruction of Ukraine.

Unlike direct taxes, indirect taxes, which include all three types of customs payments, have a limited regulatory impact on macroeconomic indicators. The most promising among fiscal factors is the decrease in the share of direct taxes in total tax revenues.

Changes in the taxation of foreign economic transactions were introduced practically in the first days of military operations – starting from March 2022, and this was an urgent response to new challenges and threats of wartime. In the future, legislative innovations were introduced repeatedly.

The analysis of the amendments to the current legislation, which were adopted in the period after the introduction of the legal regime of martial law in Ukraine, indicates a modification of the approach to the provision of tax benefits.

The introduced innovations are aimed at meeting the needs of the crisis state of the economy of Ukraine in connection with the occurrence of force majeure

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circumstances at the national level, namely, the introduction of the legal regime of martial law in Ukraine.

According to the letter of the Chamber of Commerce and Industry of Ukraine dated February 28, 2022 No. 2024/02.0-7.1, the military aggression of the Russian Federation against Ukraine, which was the reason for the introduction of martial law from 05:30 on February 24, 2022 until its official end, is extraordinary, unavoidable and objective circumstances for subjects of economic activity and/or natural persons under the contract, a separate tax and/or other obligation, the fulfillment of which has occurred in accordance with the terms of the agreement, contract, agreement, legislative or other regulatory acts and fulfillment in accordance which became impossible within the prescribed period due to the occurrence of such force majeure circumstances (circumstances of force majeure).

Taking into account the extremely difficult situation faced by Ukraine, the Chamber of Commerce and Industry decided to simplify the procedure for certification of force majeure circumstances (circumstances of force majeure). In order to eliminate the mandatory application to the Chamber of Commerce and Industry of Ukraine and the regional Chamber of Commerce and Industry authorized by it and the preparation of a package of documents during the period of martial law, a general official letter of the Chamber of Commerce and Industry of Ukraine regarding certification of force majeure circumstances (circumstances of force majeure)). Therefore, in the specified letter, the Chamber of Commerce and Industry certified that the introduced legal regime of martial law is a force majeure.

An analysis of changes made to the Tax Code of Ukraine during martial law shows that almost all legislative acts in the field of taxation were related to the establishment or adjustment of tax benefits. This shows the special importance of benefits, which are necessary to support individual taxpayers during martial law.

At the same time, the analysis shows the lack of a systematic approach to the introduction of tax benefits. Thus, the preferential norms regarding transactions for the taxation of charitable assistance, which were repeatedly introduced by individual laws of Ukraine and subsequently adjusted (see Laws No. 2120-IX), were not of a systematic nature [177], No. 2173-IX [178], No. 2516-IX [375], No. 2520-IX [376], No. 2747-IX [182]). Moreover, certain problematic moments in the application of preferential norms regarding the taxation of charitable assistance, despite the large number of adopted legislative acts, have not been resolved until now.

Some preferential norms were implemented without proper justification and subsequently canceled. In particular, this applies to those introduced by Law No. 2142-IX [179] benefits in the exemption from VAT of transactions involving the importation of goods into the customs territory of Ukraine under the customs regime of import by economic entities registered as payers of the single tax of the first, second

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and third groups; exemption from VAT taxation, excise tax for the period of martial law in the territory of Ukraine, transactions involving the importation by individuals into the customs territory of Ukraine of passenger cars, their bodies, trailers and semi-trailers, motorcycles, vehicles intended for the transportation of 10 people or more, vehicles for the transportation of goods under the customs regime of import; exemption from import duty taxation of goods imported (forwarded) to the customs territory of Ukraine by enterprises for free circulation. Later, these benefits were abolished by Law No. 2325-IX [180].

As stated in Pexplanatory note to the draft Law of Ukraine “On amendments to the Tax Code of Ukraine and other legislative acts of Ukraine regarding the revision of certain tax benefits” [89] according to the results of customs clearance by citizens of vehicles, benefits from the payment of customs payments during the period of validity of Law No. 2142 amounted to more than UAH 13 billion, the amount of benefits for customs clearance of telephones reached more than UAH 270 million, benefits for customs clearance of clothing and footwear – more than UAH 850 million. At the same time, premium class cars with a customs value of over 1 million hryvnias are registered without paying customs fees.

In addition, the reduction of taxation on imports creates competitive advantages for them compared to domestically produced products. As a result, domestic producers have additional obstacles to resume production.

In the conditions of martial law, when Ukraine has to consolidate all revenues to fight against the aggressor, the introduction of benefits for the import of goods that are not essential goods and at the same time are budget-forming should be re-evaluated and revised. This was implemented thanks to Law No. 2325-IX [180].

A similar situation also occurred with the establishment of Law No. 2120-IX [177] zero rate of excise tax on supply operations in the customs territory of Ukraine and importation of motor gasoline, heavy distillates and liquefied gas (clause 41 subsection 5 chapter XX of the PKU), which was canceled by Law No. 2618-IX [176]).

As stated in the Explanatory Note to the draft Law of Ukraine “On Amendments to Chapter XX “Transitional Provisions” of the Tax Code of Ukraine regarding excise tax rates for the period of the legal regime of martial law, state of emergency” [88], according to the information of the Cabinet of Ministers of Ukraine, there is currently a significant shortage of funds for financing the road industry. In particular, there is a need for funds to ensure the fulfillment of debt obligations for borrowings obtained by the state or under state guarantees for the development of the network of public roads, as well as for financing road works, including for ensuring the operational maintenance of roads and carrying out emergency repairs works on sections of roads and artificial structures that were destroyed and damaged as a result of the armed aggression of the Russian Federation. One of the possible ways to finance these

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needs is a partial increase in excise tax rates, which were previously reduced to 0.00 EUR per 1000 liters.

Taking into account the above, the introduction of some specific benefits precisely during the period of the legal regime of martial law raises certain doubts. In particular, this applies to implemented No. 2273-IX [377] benefits regarding the exemption from VAT of operations related to the supply, preparation (literary, scientific and technical editing, correction, etc.), production, distribution of audio books voiced in Ukrainian, except for publications of an erotic nature (clause 197.1.251 of the Code of Civil Procedure), as well as benefits established Law No. 2330-IX [181] for the operation of industrial parks in Ukraine.

After all, the introduction of such benefits can lead to additional budget losses, and the urgent need to support these operations precisely in the conditions of martial law is not obvious.

Currently, benefits related to the taxation of charitable assistance can also be attributed to the problematic category. Even after many changes introduced by the PKU regarding the procedure of taxation of charitable assistance (see Laws No. 2120-IX [177], No. 2173-IX [178], No. 2516-IX [375], No. 2520-IX [376], No. 2747-IX [182]), all problems at the regulatory level have not been resolved.

First of all, at the moment there is a lack of systematicity in the presentation of the relevant preferential norms. For example, separate norms regarding the “non-taxation” of charitable assistance are established in item 321 subpara. 2 ch. XX PKU, according to which: “as well as for the benefit of the central body of executive power, which ensures the formation and implementation of state policy in the field of civil protection, civil protection forces and/or health care institutions of state, communal ownership, and/or regional health care structural units, Kyiv and Sevastopol city state administrations, except in cases where such transactions for the supply of goods and services are taxed at a zero value added tax rate. The provisions of Clause 198.5 of Article 198 of this Code do not apply to the operations specified in this clause”.

In addition, similar norms are provided for in clause 69.5 subpara. 10 ch. XX PKU, according to which: “Operations on the voluntary transfer or alienation or seizure of goods, including excise goods, provision of services for the benefit of the Armed Forces of Ukraine and voluntary formations of territorial communities, the National Guard of Ukraine, the Security Service of Ukraine, the Foreign Intelligence Service of Ukraine, The State Border Guard Service of Ukraine, the Ministry of Internal Affairs of Ukraine, the Department of State Security of Ukraine, the State Service for Special Communications and Information Protection of Ukraine, other military formations formed in accordance with the laws of Ukraine, their units, military units, units, institutions or organizations that maintained at the expense of the state budget, for the needs of state defense, local self-government bodies, as well

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as for the benefit of the central body of executive power, which ensures the formation and implementation of state policy in the field of civil protection, civil protection forces and/or health care institutions of state and communal ownership, and/or regional health care structural units, Kyiv and Sevastopol city state administrations without prior or subsequent reimbursement of their value are not considered sales operations for tax purposes. “Therefore, it makes sense to unify the norms regarding the provision of tax benefits for charitable assistance and/or structural subdivisions on health care issues of regional, Kyiv and Sevastopol city state administrations without prior or subsequent reimbursement of their cost, are not considered sales operations for taxation purposes”.

At the moment, there is an urgent need to provide charitable assistance to both the Armed Forces and state organizations, as well as ordinary citizens. Therefore, it makes sense to exempt charitable assistance from taxation, which is provided not only to the bodies listed in p. 321 subpara. 2 ch. XX PKU, p. 69.5 subsection 10 ch. XX PKU.

As practice shows, business entities have the desire and opportunity to help the Armed Forces of Ukraine and other state authorities free of charge, including by importing to the customs territory of Ukraine and further handing over cars that are extremely important for ensuring the defense of the state. However, at present, no benefits are provided for customs clearance of such charitable assistance in regulatory documents. The Customs Code of Ukraine (MCU) establishes only specifics regarding the calculation of import duty upon importation (forwarding) to the customs territory of Ukraine as humanitarian aid of goods determined in accordance with the Law of Ukraine “On Humanitarian Aid” by the Commission on Humanitarian Aid under the Cabinet of Ministers of Ukraine, which are exempted from taxation with import duty (Article 287 of the Civil Code). However, it is too difficult to carry out such a procedure in wartime conditions.

This problem is partially solved at the sub-legal level. Yes, the provisions of para. 1 clause 1 Resolution No. 174 of March 1, 2022 “Some issues of the passage of humanitarian aid through the customs border of Ukraine under martial law” it was established that during the period of martial law, the passage of humanitarian aid from donors through the customs border of Ukraine (in the meaning of the Law of Ukraine “On Humanitarian Aid” dated 10.22.99 No. 1192-XIV) is carried out at the place of crossing the customs border of Ukraine by submitting a declaration in paper or electronic form, filled out by the person transporting the relevant goods, according to the form in accordance with Appendix 1 without applying measures of non-tariff regulation of foreign economic activity.

Goods, the passage of which is carried out in accordance with para. 1 p. 1 of Resolution No. 174 humanitarian aid is recognized on the declarative principle without

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the adoption of a corresponding decision by specially authorized state bodies on humanitarian aid issues. At the same time, the Procedure for Customs Clearance of Humanitarian Aid Cargoes, approved by Resolution No. 544 of the Cabinet of Ministers of Ukraine dated March 22, 2000, and the Procedure for Interaction of Central and Local Executive Authorities and the National Bank on the Implementation of the Law of Ukraine “On Humanitarian Aid”, approved by Resolution of the Cabinet of Ministers of Ukraine dated 25.03.2013 No. 241, do not apply.

In addition, in the Resolution CMU of March 5, 2022 No. 202 “Some issues of receipt, use, accounting and reporting of charitable assistance” it is indicated that in the conditions of martial law, the requirements established by the legislation regarding the receipt, use, accounting and reporting of charitable assistance from legal and natural persons – residents and non-residents do not apply.

Taking into account the above, under the conditions of the legal regime of martial law, recipients and receivers of humanitarian aid do not necessarily need to register in the unified register of recipients of humanitarian aid. At the same time, it is considered expedient to provide appropriate preferential rates for the operations of importing vehicles and other goods for the purpose of their free transfer to the Armed Forces of Ukraine and other state bodies specifically in PKU and MKU.

Based on the results of the analysis of changes made to the Tax Code of Ukraine in the period from January 1, 2023 to July 1, 2023, the following results were found.

A total of 10 laws amending the Tax Code of Ukraine were adopted during this period.

At the same time, 7 legislative acts were concerned with the preferential policy, of which only one law canceled the given preferences (Law No. 2876-IX). At the same time, new preferential norms were introduced in 6 laws (60 %). Of the adopted laws, 5 (50 %) related to tax administration (Fig. 1.1).

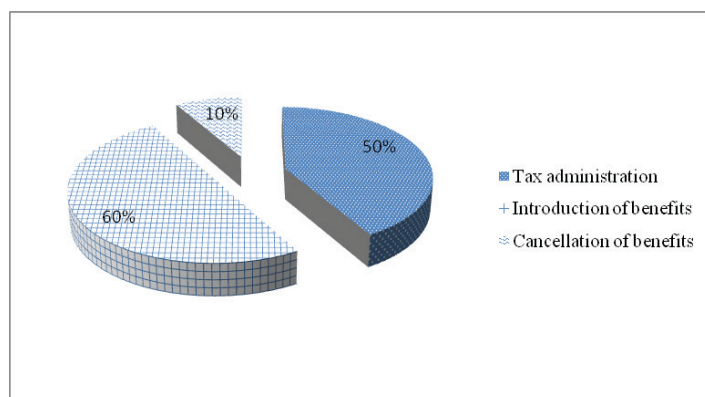


Fig. 1.1. Structure of adopted legislative acts amending the Tax Code of Ukraine in the period from January 1, 2023 to July 1, 2023

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Since most of the laws related to tax preferences, this indicates the relevance of the issue of preferential taxation in Ukraine. It should also be noted that the vast majority of laws (60 %) are aimed at introducing additional benefits.

This amount of introduction of preferential norms does not correspond to the principles laid down in the directions of development National income strategy, approved on meeting of the Cabinet of Ministers of Ukraine on March 24, 2023.

In particular, during project development National income strategy recommended and ensure the integrity of the tax base and its gradual expansion in the period after the termination or abolition of martial law, the prevention of tax amnesties and the introduction of economically unreasonable tax benefits, which in the future do not provide for the provision of social justice or economic growth and expansion of the tax base.

As stated in Vextract from protocol No. 40 of the meeting of the Cabinet of Ministers of Ukraine dated March 24, 2023 the draft of the National Income Strategy for 2024–2030 must be developed in accordance with the following basic principles:

- ensuring the integrity of the tax base and its gradual expansion in the period after the termination or cancellation of martial law;
- preventing the implementation of tax amnesties and the introduction of economically unreasonable tax benefits, which in the future do not provide for the provision of social justice or economic growth and expansion of the tax base.

The draft Strategy should provide for the implementation in the short-term, medium-term and long-term perspective of a set of measures regarding preservation of the current basis of taxation of incomes of legal entities and individuals and its further gradual expansion, optimization (reduction) of tax benefits and further expansion of the tax base.

Therefore, the analysis of legislative acts adopted during the legal regime of martial law in the field of preferential tax policy in the aspect of their harmonization with the norms of EU law becomes important.

After all, it is one of the principles that should be developed project National income strategy, specified maximum approximation of tax and customs legislation to the requirements of international standards and ensuring the fulfillment of obligations arising from Ukraine's membership in international organizations.

Analysis adopted legislative acts amending the Tax Code of Ukraine in the period from January 1, 2023 to July 1, 2023 (Fig. 1.2) showed that out of 10 adopted laws, only 2 laws (20 %) received a positive opinion of the Committee on Issues integration of Ukraine into the European Union.

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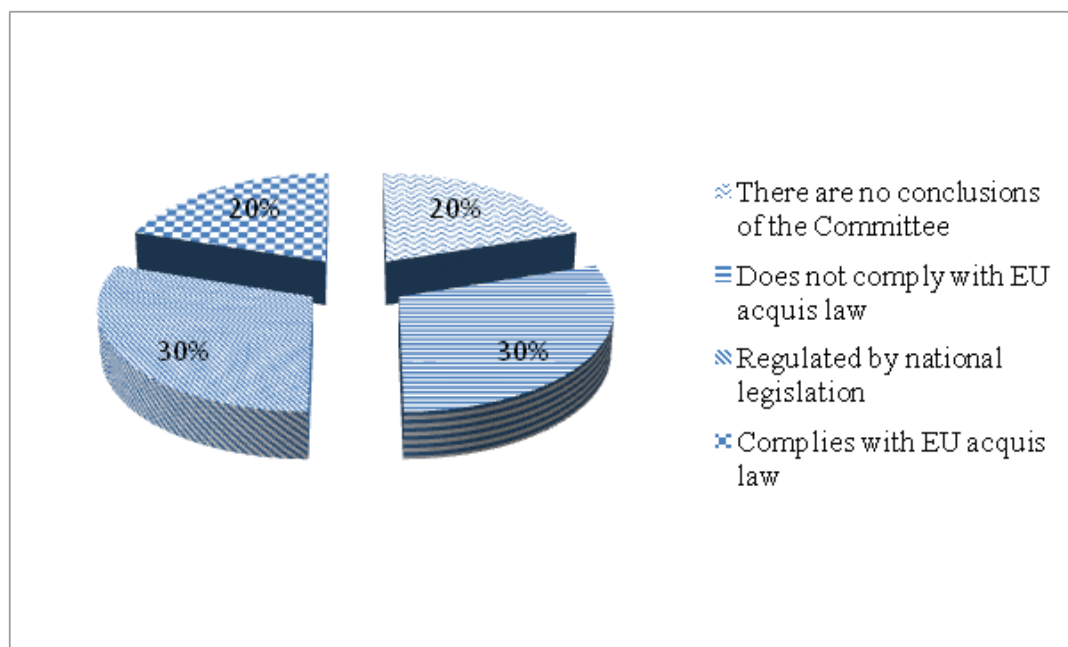


Fig. 1.2. Structure of the conclusions of the Committee on the Integration of Ukraine into the European Union on the adopted Laws of Ukraine in the field of preferential policy in the period from January 1, 2023 to July 1, 2023

With regard to 3 legislative acts (30 %), a conclusion was received, which states that the provisions are not subject to Ukraine’s international legal obligations in the field of European integration. In 3 conclusions (30 %) it is indicated that the provisions of the draft law do not comply with Directive 2006/112, while they can be applied in accordance with Articles 472 “Measures related to essential security interests” and 143 “Exceptions related to security” Association Agreements. For 2 laws (20 %), the conclusions of the Committee on the Integration of Ukraine into the European Union were not received, however, it can be concluded that the provisions of the Law are regulated by the national legislation of the member states of the European Union and are not subject to international legal obligations of Ukraine in the field of European integration.

According to the results of the analysis of legislative acts in the field of taxation, adopted in 2022–2023, it can be concluded that the adjustment of the preferential policy in the field of foreign trade operations, as well as changes in the tax policy in general, were carried out mainly intuitively, purely empirically, without a thorough theoretical – methodological support. As a result, excessive losses of budget revenues and failure to achieve the goals of the relevant regulatory measures.

This situation is due to two circumstances: firstly, a very short period of time since the beginning of the aggression, and secondly, the uniqueness of the current

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moment in the history of Ukraine. At the same time, there are already certain results of research on the ideology, directions and sequence of reforming tax policy in general and preferential foreign economic policy, in particular, including from the standpoint of creating conditions for the current stabilization of socio-economic processes and the revival of Ukraine's economy in the post-war period [124; 203; 219; 335].

There is no doubt that during the legal regime of martial law there is an urgent need for tax incentives for certain operations (objects) that are necessary to ensure the country's defense capability. Therefore, it is important to foresee these features in the project National income strategy.

In addition, during development National income strategy for 2024–2030, it is necessary to take into account that the provisions of the Strategy should be harmonized with The National Economic Strategy for the period until 2030, approved by Resolution of the CMU dated 03.03.2021 No. 179 (hereinafter – National Strategy No. 179). It should be noted that the last time changes were made to the National Strategy No. 179 by Resolution of the CMU of April 21, 2023 No. 369 (effective from May 4, 2023), that is, this document is currently relevant.

In the draft Strategy, it is recommended to provide for the implementation in the short-, medium- and long-term perspectives of a set of measures regarding: preservation of the current base of income taxation of legal entities and individuals and its further gradual expansion.

At the same time, the specified provisions do not correlate with the corresponding provisions National Strategy No. 179. In particular, it is necessary to pay attention to such provisions of National Strategy No. 179, which do not coincide with the outlined directions National income strategy.

Yes, with the growing tax burden in National Strategy No. 179 is classified as unacceptable steps, prohibited directions of movement, which are critical obstacles to the development of Ukraine's economy ("red lines"). Unfair use of economic incentives is also included in such steps. In the current version of the National Strategy No. 179, almost all Strategic Courses provide for the adoption and implementation of new tax incentives (preferences).

1. Strategic course of macroeconomic policy with and strategic goal 1 "Ensuring the stability of public finances and improving sovereign ratings" refers to the challenges and barriers on the way to achieving strategic goals, including the following:

- imperfect tax system (discretionary taxes, high tax burden on wages, opportunities to optimize taxation);
- the threat of an increase in the state budget deficit (the need to increase state expenditures, introduce tax incentives, combined with the need to reduce the budget deficit).

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In the Strategic Course of Macroeconomic Policy, the ways to achieve the strategic goal include, first of all, the reduction of the tax burden on business, which involves the implementation of the following tasks:

- carrying out an additional analysis of the feasibility and potential replacement of the corporate income tax with a tax on withdrawn capital;
- conducting additional analysis and determining the possibility of reducing the tax burden on the wage fund according to the optimal model with the establishment of compensators for the budget;
- capital amnesty;
- reducing the level of discretionary tax on real estate and land, increasing the level of budget revenues from these taxes.

2. The strategic course of state policy on increasing investment attractiveness according to strategic goal 1 “Create the necessary conditions for attracting investments” is highlighted among the ways of achieving the strategic goal of Art creation of effective tools for attracting external investors, which involves solving the following tasks:

- ensuring the implementation of mechanisms for tax benefits for investors (tax holidays, reimbursement of part of capital investments, special tax regimes) in most sectors of the economy;
- expansion and creation of new industrial parks, creation of conditions for conducting business within the industrial park.

According to strategic goal 2 “To create an attractive ecosystem for the accumulation and multiplication of domestic capital” the goal of increasing the efficiency of the use of capital, to achieve which it is planned to stimulate the investment activity of economic entities of Ukraine due to the introduction of a tax on withdrawn capital instead of an income tax.

3. The strategic course of the direction “Information and communication technologies” under strategic goal 3 “Creation of a better environment in the region for the production of technological products and implementation of startups” provides for increasing the access of IT companies to investments, for which it is planned to expand financing options from the Ukrainian Startup Fund and increase its budget up to 20 million USD and exemption from taxation of grants for the creation of technological products.

4. The strategic course of policy in the field of development of the agro-industrial sector according to strategic goal 4 “Balance of the production of high- and low-margin products to increase the profitability of the sector” is allocated a direction with ensuring the development of the production of high-margin crops, in which the following tasks are planned to be solved:

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- provision of partial reimbursement of investment costs associated with the transition to the cultivation of high-margin crops;
- provision of tax incentives for producers of high-margin crops;
- directing tax revenues from the sale of high-margin crops to the development of this direction.

To ensure the development of the sales system, it is planned to carry out:

- establishment of trade relations with key countries in target sales markets;
- assignment of state support to agricultural cooperatives and agricultural cooperative associations that conduct export activities (tax, customs benefits, direct financial support).

5. The strategic course of industrial development under strategic goal 3 “Strengthening the competitiveness of industrial products produced in Ukraine, the introduction of resource- and energy-efficient technologies” provides for the stimulation of the modernization of fixed assets, for which it is planned to ensure the extension of the mechanism of installments/reimbursement of value added tax on the import of equipment for modernization industry sectors focused on the production of goods with high added value.

Measures to increase resource efficiency include the introduction of a system of tax incentives for eco-modernization.

According to strategic goal 3 “Ensuring the satisfaction of the needs of the national economy, creating a reliable basis for the production of products with high added value” it is planned to stimulation of production, for which the following measures are provided:

- review and optimization of industry taxation;
- development of incentives for small and medium-sized businesses;
- provision of preferential depreciation;
- improvement of mechanisms for implementing agreements on product distribution;
- establishment of an incentive rent rate for the extraction of hydrocarbons (oil, condensate) within five years from the day of the start of drilling a new well;
- bringing the rate of taxation of rent payments for oil and gas extraction to the average European indicators;
- introduction of a progressive scale of taxation, defining groups of subsoil users according to different criteria and with different benefits;
- introduction of benefits for profits reinvested in production;
- introduction of a stimulating taxation regime for enterprises operating new and restored wells;
- introduction of a preferential regime to stimulate the production of hard-to-produce and unconventional hydrocarbon deposits.

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In order to achieve the goal of improving primary processing, it is envisaged to introduce the concept of “Integrated subsoil use object” into the legislation and establish non-auction access to subsoil for the owners of such objects, provide preferential tax conditions for subsoil users who build primary processing enterprises (in particular, to create a full production cycle of titanium, graphite, etc.).

6. Strategic course of development of transport and transport infrastructure with and strategic goal 1 “Ensuring the needs of the Ukrainian economy at the expense of developed and modernized transport” measures are provided for the development of road transport, in particular, due to the reduction of the tax burden.

According to strategic goal 3 “Ensuring effective and fair regulation of price policy in the field of transport”, it is planned to ensure the financial rehabilitation of JSC “Ukrzaliznytsia” through the implementation of stabilization programs, in particular, the effective sale of scrap metal of JSC “Ukrzaliznytsia”, ensuring the sale of non-core assets, exemption from taxation of land under the railway infrastructure, etc.

7. The strategic course of the digital economy under strategic goal 2 “Transformation of resource sectors of the economy into highly productive, intelligent and competitive” provides for the improvement of infrastructure and regulation of Industry 4.0 and the development of a draft law on the introduction of tax benefits for companies that introduce high-tech solutions that help make production more competitive ecological

8. The strategic policy course in the field of quality of life under strategic goal 4 “Ensuring a high level of health and high indicators of life expectancy and healthy life expectancy” is planned to transform the health care financing system, including through the introduction of tax incentives for employers, which provide voluntary health insurance for employees, provision of tax mechanisms for deductions of insurance payments of employees and individual entrepreneurs, activation of work with employers’ associations regarding the wider application of voluntary health insurance.

The goal of “Development of national pharmaceutical production” is to reduce the tax and customs burden on equipment, accessories for it, and other materials for the production of innovative medicines, vaccines, and medical equipment.

In terms of improving the regulatory mechanism for clinical trials, it is planned to:

- introduction of value-added tax compensation and preferential taxation for the import of drugs and technologies for conducting clinical trials;
- stimulating the conduct of clinical research by Ukrainian and foreign pharmaceutical companies through tax incentives.

Therefore, in the current edition of the National Strategy No. 179, almost all Strategic Courses provide for the adoption and implementation of new tax incentives (preferences). At the same time, the principles (measures) outlined in Protocol No.

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40 provide for the optimization (reduction) of tax benefits and further expansion of the tax base. In order to unify the relevant provisions, it is necessary either to make changes to the National Strategy No. 179, or to adjust the relevant development principles National income strategy for 2024–2030.

Since during development National income strategy for 2024–2030, it is recommended to reduce it tax benefits, it is advisable to analyze the current benefits for their possible further cancellation.

1. Benefits for subjects of cinematography introduced from 01.01.2011 by the Law of Ukraine “On Amendments to the Law of Ukraine “On Cinematography” and other laws of Ukraine on supporting the production of national films” dated 02.18.2010 No. 1909-VI.

Currently, all operations in the chain from production to distribution and demonstration (public screening, public notification and public demonstration) of national films, as well as operations for the supply of works and services for dubbing and dubbing in the state language of foreign films on the territory of Ukraine, are actually exempt from VAT. duplicating, distributing and showing such films.

In 2020, VAT benefits were also extended to the supply of distribution and screening services for films adapted into Ukrainian versions for the visually impaired and the hearing impaired. At the same time, if the relevant operations regarding national films and foreign films that are dubbed and voiced in the state language on the territory of Ukraine are temporarily (from January 1, 2023 to January 1, 2025) exempt from taxation, provided that both adapted into Ukrainian-language versions for people with visual impairments and people with hearing impairments, the same operations with regard to films in general (Ukrainian-language and foreign), adapted into Ukrainian-language versions for people with visual impairments and people with hearing impairments, are taxed at a preferential rate of 7 % .

There are reasons to consider it inappropriate to provide two different benefits. After all, in both cases, we are talking about benefits for entities that carry out the distribution and demonstration of films, and the purpose of their introduction should be to stimulate such entities to provide services for persons with special needs. As for the peculiarities of the process of adapting films to the needs of such persons, in this case it is irrelevant. It would be important if the benefit was granted to entities that adapt films into Ukrainian-language versions for people with visual impairments and people with hearing impairments. So taxing the operations of showing such films at a concessional rate of 7 % is, in our opinion, a sufficient concession. In order for it to also meet EU requirements, the word “distribution” should be removed from its wording.

Information on the amounts of tax benefits granted to subjects of cinematography during 2014–2019 is given in the Table. 1.1.

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Table 1.1. Tax benefits for subjects of cinematography, granted in 2014–2019.

Privilege	Indicator	2014	2015	2016	2017	2018	2019	In total
VAT exemption (code 1401046)	Number of subjects	39	25	40	51	75	89	
	The amount of the benefit, million hryvnias	17.07	22.68	35.34	86.84	174.80	159.38	496.11
VAT exemption (code 14010464)	Number of subjects	80	64	–	5	28	28	
	The amount of the benefit, million hryvnias	63.12	69.13	–	6.64	896.57	699.44	1734.90

Source: compiled and calculated based on the data of consolidated reports of the DPS of Ukraine on the amounts of benefits, which are losses of budget revenues, in terms of benefit codes and types of payments.

According to the Table 1.1, the total amount of benefits granted over six years amounted to UAH 2.2 billion. However, it was extremely unevenly distributed over the years. Cinema subjects received the smallest amount of benefits in 2016 (compared to 2015, it decreased by 61.3 % and accounted for 1.6 % of the total amount of benefits), the largest in 2018 (compared to 2017, it increased in 11.5 times and amounted to 48 % of the total amount of benefits).

In addition to tax benefits, cinematography subjects are also provided with direct state support. According to the Law of Ukraine “On State Support of Cinematography in Ukraine” dated March 23, 2017 No. 1977-VIII, it can be carried out in three forms – public procurement of goods, works and services necessary for the production (creation) of documentary, educational, animated films, films for children’s audience, author’s films and debut films; state subsidies for the creation (production), distribution, advertising and popularization of national films, reimbursement of part of the qualified expenses incurred by a foreign cinematography entity in the production of films, promotion of services to the domestic film industry, conducting fundamental and applied research, etc.; compensation to subjects of cinematography for interest paid on bank loans.

Taking into account the provision of state support to cinematography subjects in both direct and indirect forms, the object of analysis should be the effectiveness of state support of such subjects in general, and not only the effectiveness of providing tax benefits, because both of them are expenses of the state budget. However, the audit of the effectiveness of the use of state budget funds provided for the development of cinematography and the management of state-owned objects in this area, which was conducted by the Accounting Chamber in order to establish “the productivity, effectiveness, economy of the use of state budget funds allocated to the Ministry of

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Culture of Ukraine for the creation and distribution of works cinematography and state support for the development of cinematography, implementation of concert and artistic events in the field of cinematography” [306] was limited to the audit of the use of relevant budget expenditures.

Analysis of state and consolidated budget expenditures on cinematography during 2010-2020 showed that their rapid growth in 2010–2012 (by 5.5 and 3.6 times, respectively) was replaced by a drop of 62.3 % and 56.3 % in 2014 compared to 2012. The total sum of expenditures of the combined budget for five years amounted to UAH 629.9 million, and according to the budget program for the creation and distribution of national films – UAH 443.8 million. The direct result of direct state support for cinematography at the expense of the budget program was the creation of 142 national films (including 25 full-length films), completed with the participation of State Cinema. So, on average, budget costs for the creation of one film during 2010–2014 amounted to UAH 3.1 million, showing a downward trend during the period from UAH 10.5 million to UAH 1.3 million.

Over the next five years (2015–2019), expenditures of both the state and consolidated budgets in this area showed high annual growth rates, with the exception of 2019. In general, during the period under consideration, expenditures of the consolidated budget increased by 2.9 times, and their total amount was UAH 2.668.8 million, while expenditures under the budget program for the creation and distribution of national films amounted to UAH 1.842.0 million or 69 % of the above amount. During this period, with the participation of Derzhkino, the production of 183 films was completed, including 69 feature films. Direct state support for the production of one film during the period averaged UAH 10.1 million, tripling compared to the previous five-year period and showing both growth and decline in individual years (2016 and 2019). However, the most telling thing is that in 2020.

The growth of the production of national films with direct state support and their recognition at international competitions and festivals is a confirmation that, in general, state support for cinematography is effective. However, not all state funds allocated to the production of national films are used effectively. In particular, according to the auditors of the Accounting Chamber, “out of 54 films completed in 2015–2016 and the first half of 2017, of which 13 are full-length, nine were shown on the wide screen to the Ukrainian audience. As a result, the main goal of creating national films – the formation of the spiritual values of the Ukrainian people by involving Ukrainian citizens in the national cinematography – is not being achieved”. And the funds spent on such films turn out to be useless, they not only do not pay off, but also bring neither moral nor material profit. The reasons for such phenomena are not only the low quality of some films, but also the improper management of the field of cinematography, in particular, the loss of state influence on the provision of film screening services. In particular, as noted in the Report of the Accounting Chamber, “contrary to the requirements of

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Article 22 of the Law of Ukraine “On Cinematography”, no subject of cinematography in 2015–2016 and the first half of 2017 complied with the 30 percent, and since March 2017 – the 15 percent national film screening quotas. As a result, the film and television production market is 95 % filled with foreign products” “contrary to the requirements of Article 22 of the Law of Ukraine “On Cinematography”, in 2015–2016 and in the first half of 2017, no cinematographic entity complied with the 30 percent, and since March 2017, the 15 percent quota for showing national films. As a result, the film and television production market is 95 % filled with foreign products” [306].

We will analyze the effectiveness of state support for cinematography using direct and indirect (tax) levers (Table 1.2).

Table 1.2. State support of cinematography subjects and its effectiveness in 2014–2019

Indicator	2014	2015	2016	2017	2018	2019	In total
1	2	3	4	5	6	7	8
The amount of tax benefits, million hryvnias	85.53	91.82	35.34	93.48	1071.37	858.83	2236.37
The amount of budget expenditures under the program for the creation and distribution of national films, million hryvnias	29.48	133.37	251.52	496.35	511.72	449.00	1871.44
The total amount of state support, UAH million	115.01	225.19	286.86	589.83	1583.09	1307.83	4107.81
Growth rate, %		195.8	127.4	205.6	268.4	82.6	
Number of completed films created with government support	23	7	35	47	48	46	206
Including:							
game feature films		3	4	17	26	19	69
short animations		2	9	5	4	4	24
The amount of tax costs on average for the production of one film, UAH million	3.72	13.12	1.01	1.99	22.32	18.67	10.86
The amount of budget costs on average for the production of one film, UAH million	1.28	19.05	7.19	10.56	10.66	9.76	9.08
State support on average for one film, UAH million	5.00	32.17	8.20	12.55	32.98	28.43	19.94

Source: compiled and calculated based on the data of the State Treasury Service of Ukraine and consolidated reports of the DPS of Ukraine on the amounts of benefits, which are losses of budget revenues, in terms of benefit codes and types of payments.

According to the Table 1.2, state support for cinematography subjects during 2014–2019 showed a constant upward trend, with the exception of 2019, when it decreased compared to 2018.

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If in 2014, 2018 and 2019, a larger amount of support was provided at the expense of indirect (tax) expenses, then in other years – at the expense of expenses under the budget program. Over six years, the total amount of support amounted to more than UAH 4 billion, more than 54 % of its volume was provided at the expense of tax benefits. Its result was the creation of 206 completed films, the support of which cost the state an average of UAH 19.9 million per film, of which UAH 10.9 million were tax costs.

The conducted analysis showed that the growing recognition of the creative industry in Europe and the world, including cinema and television, causes the growth of their state support. The latter is carried out using tax and direct budget levers. There are three main types of tax incentives commonly used in Europe: tax shelters, tax rebates and tax credits.

State support of subjects of creative industries, including cinematography, with the use of tax levers in European countries is provided in the form of corporate income tax benefits. Instead, in Ukraine, such support is provided mainly in the form of VAT benefits. Moreover, if the exemption from VAT of transactions for the supply of works and services for the production of national films can still be explained by the long production cycle in this industry and the high cost of credit resources in Ukraine, which makes it difficult to use them to replenish the working capital required for the payment of input VAT, then the exemption of all other subjects from paying VAT throughout the entire chain – from production to showing films – can hardly be considered sufficiently justified. It also contradicts the requirements of Directive 112 of the EU Council.

On the basis of the above, it is considered expedient to abandon most VAT exemptions for subjects of cinematography.

2. Exemption from taxation of audiobook supply operations.

Analysis of the changes made to the Tax Code of Ukraine during martial law shows that almost all legislative acts in the field of taxation were related to the establishment or adjustment of tax benefits.

The introduction of some specific benefits during the period of the legal regime of martial law raises certain doubts. In particular, this applies to implemented No. 2273-IX [377] benefits regarding the exemption from VAT of operations related to the supply, preparation (literary, scientific and technical editing, correction, etc.), production, distribution of audio books voiced in the Ukrainian language, except for publications of an erotic nature (clause 197.1.251 of the Tax Code of Ukraine).

The Tax Code of Ukraine already provides an exemption for the supply (subscription) and delivery of periodicals of printed mass media (except publications of an erotic nature) of domestic production, preparation (literary, scientific and technical editing, correction, design and layout), production (printing on paper or recording on an electronic medium), distribution of books, including electronic

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content (except publications of an erotic nature) and children's book publications, domestically produced, student notebooks, textbooks and study guides, domestically produced Ukrainian-foreign or foreign-Ukrainian language dictionaries at customs territory of Ukraine (item 197.1.25 of the Tax Code of Ukraine).

The authors of the draft law noted that audiobooks are a product that is rapidly spreading on the Ukrainian and world markets, because unlike printed books, audiobooks have many advantages in terms of convenience and speed of reading, more favorable price, distribution, as well as environmental protection. And to illustrate, the authors of the bill gave an example in the USA, where sales of audio books in 2020 increased to 1.2 billion dollars, which is 16 % more than in 2019.

At the same time, experts emphasize that in Ukraine, in most medium and large companies of the market, only about 5 % of the publishing portfolio is released in audio format. Last year, the total volume of the official e-book market in Ukraine was only 7 %, of which audio was only 1.5 %. One of the factors inhibiting the growth of the industry, market participants consider the widespread culture of piracy, when people prefer to download audiobooks on the Internet or listen to them for free on YouTube or Telegram instead of buying them. It is unprofitable for publishing houses to invest in an expensive product, which can then be stolen and roam freely on the Internet, because in this way they will work at a loss. So, today, the majority of the segment of the audiobook market in Ukraine is provided by one large company.

In addition, you should consider the comments of the Committee on Ukraine's Integration into the European Union, set out in the Conclusion on the draft Law of Ukraine "On Amendments to the Tax Code of Ukraine on Exemption from Value Added Tax on Supply of Ukrainian-language Audiobooks".

In particular, in this Conclusion, the Committee noted that Directive No. 2006/112/EU does not provide for exemption from value-added tax for operations related to the supply, preparation (literary, scientific and technical editing, correction, etc.), production, distribution of audio books and electronic services from supply of electronic copies (electronic-digital information) and/or providing access to audiobooks. In accordance with the first part of Article 99, Member States may also apply one or two reduced rates for specific goods or services specified in Annex III "List of supplies of goods and services to which reduced rates may be applied" (hereinafter Annex III) to this Directive. Such a reduced rate cannot be lower than 5 % and, in accordance with Annex III of the Directive, applies to supplies, including borrowing by libraries.

Directive 2009/47/EC1 and Directive 2018/17132, in order to enable the application of reduced rates or benefits (in a limited number of specific situations), respectively, for social or health reasons, as well as to clarify and adapt to technical progress part, concerning books, Annex III to Directive No. 2006/112/EC of May 5, 2009 was amended accordingly. These amendments provide that Member States

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may apply reduced rates of value added tax to supply transactions, including but not limited to libraries, of books, newspapers and periodicals, in physical or electronic form, or both (including brochures, leaflets and similar printed materials, children's picture books for drawing or coloring, printed or handwritten musical publications, maps, hydrographic or similar charts).

According to the first part of Article 3 of the Law of Ukraine "On State Aid to Economic Entities", which was adopted to fulfill Ukraine's international obligations, in particular, in accordance with the Agreement, the effect of this Law extends to any support of economic entities by providers of state assistance at the expense of state resources or local resources for the production of goods or the implementation of certain types of economic activity, except for the cases provided for in part two of this article. By signing the Agreement, Ukraine undertook, in accordance with Article 264 of the said Agreement, to apply the rules for the operation of state aid, defined in Articles 262, 263 (3) or 263 (4) of this Agreement, and to use the relevant judicial practice of the Court of the European Union, as well as secondary legislation, framework provisions, guidelines and other valid administrative acts of the Union. Part one of Article 262 of the Association Agreement establishes that any aid provided by Ukraine or the member states of the European Union using state resources, which distorts or threatens to distort competition by favoring certain enterprises or the production of certain goods, is incompatible with the proper functioning of this Agreement to the extent that it may affect trade between the Parties. Thus, state support is provided for by the provisions of the draft law, which is provided for audio books, at the expense of state or local resources, which distorts or threatens to distort economic competition, creating advantages for the production of certain types of goods or the conduct of certain types of economic activity.

In view of the above, it is considered expedient to cancel the privilege for the supply of audio books, since its introduction of such privileges may lead to additional budget losses, and the urgent need to support these operations precisely in the conditions of martial law is not obvious.

1. Delivery of tobacco products to the customs territory of Ukraine. Pursuant to the provisions of Article 197.27 of the Tax Code of Ukraine, operations related to the supply of tobacco products, tobacco and industrial tobacco substitutes, liquids used in electronic cigarettes, for which maximum retail prices have been established, in the customs territory of Ukraine, are exempt from VAT taxation, except for the following operations:
 - a) from the first supply of such goods by their manufacturers;
 - b) from the first supply of such goods by business entities that are connected by control relations with producers in the sense of the Law of Ukraine "On Protection of Economic Competition". The list of economic entities

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connected by control relations with producers is approved by the Cabinet of Ministers of Ukraine at the request of the central executive body, which ensures the formation and implementation of the state policy of economic, social development and trade;

- c) from the import of such goods into the customs territory of Ukraine and their first supply by the importer in the customs territory of Ukraine.

These norms have been implemented The Law of Ukraine “On Amendments to the Tax Code of Ukraine and other legislative acts of Ukraine on ensuring the balance of budget revenues” No. 1914-IX dated on November 30, 2021 and entered into force with 01.01.2022.

As stated in Pexplanatory note to the draft Law of Ukraine “On making changes to the Tax Code of Ukraine and some legislative acts of Ukraine on ensuring the balance of budget revenues” these changes are due to the fact that the current economic situation requires a review of approaches to the collection of individual taxes, which will be directed to:

- creation of more effective mechanisms for the collection of these taxes;
- prevention of unjustified use of tax benefits;
- promotion of voluntary tax payment;
- creation of fair taxation conditions for all taxpayers;
- ensuring the mobilization of financial resources to the budgets of different levels in a sufficient amount.

At the same time, VAT exemption for supply operations tobacco products, tobacco and industrial tobacco substitutes, liquids used in electronic cigarettes does not contribute mobilization of financial resources to the budgets of different levels in a sufficient amount. In addition in Directive 2006/112 does not provide for the exemption from VAT of transactions with tobacco products, so it can be concluded that these norms do not comply with the provisions of the EU acquis and the Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community and by their member states, on the other hand.

In view of the above, it is considered appropriate to analyze the changes in VAT revenue to the budget, which were caused by the reviewed provisions of Law No. 1914-IX, and based on the results of the analysis, draw a conclusion regarding the possibility of canceling such an exemption.

Therefore, the revealed state of compliance with the EU acquis law of legislative acts in the field of preferential tax policy in Ukraine, adopted for the period from January 1, 2023 to July 1, 2023 during the legal regime of martial law, indicates the existence of legislative acts on which the Committee’s conclusions were not received on Ukraine’s integration into the European Union, It is important to develop a set of actions to eliminate such situations in the future. Official bodies

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should necessarily be guided by the guidelines set forth in the Recommendations for Ukrainian state administration bodies on approximation to EU law and analyze draft laws for compliance with the EU acquis right at the stage of their development. It is also advisable to provide mechanisms in regulatory acts.

We should also note that the vast majority of experts note the need to differentiate tax policy during the active phase of military operations and in the post-war period. At the same time, the thesis about the need for tax reform after the end of the war is debatable, considering that the basis and prerequisites for post-war reform of tax policy should be laid during the period of martial law. That is, it is more correct to understand these stages as components of one reform process, and not as different tax reforms. Both stages are organically connected, although they differ in the vast majority of key features (Table 1.3).

Table 1.3. Distinctive features and characteristic features of the preferential tax policy in the period of martial law and post-war revival

Sphere of differences	Period	
	Martial law	Post-war revival
1	2	3
The nature of the preferential tax policy	Broad tax support	Targeted tax incentives with elements of tax support
Ratio of functions of taxes	Clear priority of the regulatory function of taxes due to pushing the fiscal function to the background	Strengthening the role of the fiscal function while focusing the regulatory function on priority areas
Degree of activity	Reactive	Proactive
Priority areas of preferential policy	Support of population employment, including displaced persons	Stimulating the creation of new jobs
	Reduction of the tax burden	Stimulation of investment activity
	Ensuring the availability of critical import goods	Stimulation of wide implementation of innovations
	Reducing the costs of attracting and using charitable assistance	Stimulating the creation and development of export-oriented industries
	Support for the relocation of enterprises	Stimulation of structural restructuring of the national economy Stimulation of energy efficiency and use of alternative energy sources
Time limits	It is clearly limited by the period of martial law established in the state	There are no clear time limits, individual measures begin to be implemented within the limits of the previous stage
Level of mobility	The need for prompt regulation and adjustment of the decisions made	The period of application of tax policy instruments is long enough, which allows business entities to obtain long-term effects

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According to the nature of the preferential policy, the first (war) stage is focused on providing relatively broad tax support, that is, aimed at mitigating and leveling the negative consequences of the war for the population and business. At the stage of post-war revival, tax policy will be reoriented from broad tax support to tax incentives focused on defined priorities, with elements of “point” tax support.

The evolution of the nature of tax policy also determines the dynamics of the priority of tax functions. At the first stage, the priority is clearly given to the regulatory function, and the fiscal function is considered through the prism of ensuring minimum acceptable budget revenues. At the second stage, an increase in the role of the fiscal function should be ensured, provided that tax regulation is focused on stimulating the development of priority types of business activities and sectors of the national economy. At the same time, the fiscalization of tax policy under certain conditions may become possible and necessary already at the first stage, as emphasized by D. Hetmantsev [124].

According to the degree of activity, tax policy during the period of martial law is reactive, that is, it must respond to emerging challenges, and at the second stage, with the help of tax regulation tools, a transition to proactive policy is made, that is, tax means ensure the formation of conditions for development according to established priorities directions

The analysis of the possible directions of the tax policy at the two stages differs significantly, these differences are caused by different general economic tasks of the stages. However, one of the identified priorities remains. This refers to solving the problem of employment of the population. At the first stage, it is about tax support for effective employment of the population, which is due to the closure of enterprises in the areas of hostilities, internal migration and relocation of enterprises. During the period of post-war recovery, the same problem appears in a slightly different perspective – stimulating the creation of new jobs: firstly, it provides labor resources for the structural restructuring of the national economy, and secondly – it contributes to the growth of labor productivity, since new jobs have a higher level technical support.

The first of the stages of modern tax policy reform has clearly defined limits of application, which correspond to the moment of the introduction and cancellation of martial law, and in relation to the second stage, there is no such clarity. The fact is that the application of specific tax policy instruments can begin even before the official end of martial law, and the deadline for their application is determined not by a specific date, but by their effectiveness and the degree of fulfillment of the relevant tasks of economic development.

The analysis of existing problems in the field of tax policy made it possible to formulate the following principles of its reconstruction in the war and post-war periods.

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The tax policy of martial law should contribute to the solution of urgent tasks of countering aggression under the condition of ensuring minimally acceptable budget revenues. That is, the implementation of the regulatory function of taxes comes to the fore, and the fiscal function plays the role of a kind of limitation. At the same time, the main role in balancing the budget should be played by debt instruments.

When making decisions on preferential taxation during the period of martial law, one should take into account the need to maintain a certain balance of revenue losses of the state and local budgets. Providing tax benefits for taxes, which are the sources of formation of local budgets, significantly changes the financing conditions of united territorial communities, which limits their opportunities to stimulate business development and implement business projects.

The wartime tax policy has a limited period of application, which must be, firstly, regulated in detail by relevant legislative acts, and secondly, clearly implemented by the executive authorities. This also requires a certain stability of the legislative power, which must withstand the established order.

When transitioning to the period of post-war economic recovery, the balance between the fiscal and regulatory function of taxes should be shifted towards an increase in the role of the fiscal function, with a simultaneous reorientation of the regulatory from tax support to focused tax stimulation of the revival of the economy. At the same time, the main priorities should be the stimulation of: investments (and especially investments in innovation), creation of new jobs and energy saving.

The gradual transfer of the focus of tax support and stimulation of the development of small and medium-sized businesses from the national level to the level of territorial communities, taking into account the priorities of their development, which will contribute to the creation of conditions for their self-development at the expense of increasing their own tax bases.

The obtained results can be used in the preparation of proposals for amendments to legislative acts aimed at achieving compliance with the EU acquis and improving preferential taxation in Ukraine.

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The wide application of indirect taxes is mainly related to the high fiscal potential of such taxes. Many economists believe that indirect taxes can bring in as much or more than all other taxes. At the same time, one of the tools for implementing the fiscal function of the consumption tax is the list of taxable products and the tax rate established by law. In the modern tax system, specific excise duties are usually next after VAT both in terms of cost and budget revenues. Excise taxes are levied on goods that are usually not basic and are produced with a fairly high level of profitability.

Along with the fiscal function, indirect taxes, like any other taxes, have regulatory significance. The regulatory function is manifested in several aspects, in particular: influence on the volume of imports, production and consumption of taxed goods; influence on the structure of production, stimulation of the growth of its efficiency, improvement of product quality and improvement of consumption, product characteristics; regulation of the profitability of the production of taxable goods. In general, the restrictive effect of indirect taxes on consumption (and therefore production) may extend to goods that are dangerous to society, primarily alcohol and tobacco.

Harmonization of taxation is a necessary requirement for the country's accession to the European Union. Ukraine's path to joining the European Union is unlike the path of any other country, as our country faced armed aggression from Russia. It is extremely difficult to harmonize the tax system under conditions of physical destruction of the country's citizens, industrial potential, economy and national wealth of Ukraine in general.

In the field of public finances, Ukraine faced a significant reduction in tax revenues and at the same time the need to increase defense funding. Costs for financing internally displaced persons and the unemployed have increased. The collapse of the national financial system did not occur because of international financial assistance. But such assistance does not compare with the stable tax revenues that came to the country's budgets in peacetime. In addition, international aid is not regular and sufficient to restore the economy and finance the country's defense. Under these conditions, the harmonization of taxation of Ukraine and the EU should take place by restoring and adapting the economy and public finances to the conditions of a protracted war.

Indirect taxes are types of taxes that can be a stable source of tax revenues for the country's budgets. Such taxes (when they imposed rationally) can minimize the impact on socially vulnerable sections of the population by shifting the tax burden to the wealthy sections of the population at the same time.

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The presence of value added tax in the national taxation system is one of the requirements for the country's entry into the European Union. Harmonization of the administration of the value-added tax in Ukraine is necessary from the point of view of the integration of our country into the European community and for the purpose of improving the administration of such a fiscally important tax in national practice. Considering the thirty-year history of the administration of this tax in Ukraine, multiple reforms contributed to the holistic approval of the value-added tax in the taxation system of Ukraine.

If the previous reforms of the value added tax were concerned with improving its existence in the taxation system, then the war that started with Russia in 2022 caused the need for changes to support the national economy and strengthen the security of the state. In particular, the supply of goods and services important for ensuring national security and defense is exempted from taxation. In view of the constant shelling of oil storage facilities and the acute shortage of these resources, a preferential 7 % rate was also imposed in 2022 for operations on the import and supply of fuel and oil products [378]. Such a measure led to a decrease in tax revenues, but still made it possible to stabilize fuel prices in Ukraine in conditions of fuel shortages and inflationary currency fluctuations.

During the martial law, the approach to electronic VAT administration was somewhat reduced. Thus, payers can include tax amounts in the tax credit on the basis of primary documents in case the supplier has not registered such VAT. But such invoices must be registered in the six-month period after the end of the legal regime of martial law in the future.

The next task of reforming the practice of indirect taxes' administration in Ukraine should be the maximum convergence of its norms with the tax law of the European Union. A key national feature of Ukrainian VAT should be the implementation of modern digital achievements into the administration system.

In recent decades, indirect taxes in the countries of the European Union has been gradually reoriented to a tool of regulatory and protective influence. EU member states must apply such taxes to certain groups of excise goods: alcohol, tobacco, and energy products. In some EU countries, non-harmonized excise taxes on cars are applied, which are charged in the form of tolls for the use of automobile roads. But the limited taxation of certain groups of excise goods does not allow the excise to compete equally with the universal excise on consumption – value added tax.

EU legislation on excise duties includes:

- defined categories of goods and the method of tax application to them;
- minimum rates that must be applied in all EU countries;
- possible benefits and exclusions;
- general rules of production, storage and movement of these goods across the EU.

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At the same time, not only the Ukrainian system of taxation of indirect taxes needs improvement and harmonization, but also the European one, which, despite constant improvement, still demonstrates the imperfection of such administration. The VAT administration system in Europe has existed for almost thirty years and it does not always correspond to technological progress, digital economy, changes in business models and globalization. In particular, tax gaps between expected and actual VAT revenues are monitored every year. For example, in 2020, such a gap amounted to 93 billion euros [294]. In addition, the development of digital technologies and internet business bring additional problems to the practice of VAT administration in European countries, which is manifested in growing fraud. The business adapts to preferential norms in the field of VAT taxation and minimizes its own tax liabilities. Therefore, one of the main urgent goals for the European Union has become the adaptation of the taxation system to the digital economy, as well as taking into account the interests of small and medium-sized enterprises [239]. In fact, the harmonization of tax rates and the formation of a single system of VAT administration in the EU countries ceased to be the key goal [407].

The measures proposed to be used in the EU countries are appropriate for implementation both in the European system and in the Ukrainian system. In particular, to overcome annual gaps in VAT receipts, the following is proposed:

- transition to real-time digital reporting based on electronic invoicing for companies operating outside the EU and system harmonization for internal operations. Such a system will allow to implement the digital reporting in real time and, after its implementation, will provide information to the governments of EU countries. It will be possible to reduce the gaps in VAT by 11 billion. euros annually with the help of this information according to the European Commission assessment;

- updated VAT rules for passenger transport – according to the new rules, operators of economic platforms will be responsible for collecting VAT in the event that suppliers of such services do not (such suppliers are usually small businesses and are mostly not registered as VAT payers). This will help reduce the administrative burden on such small businesses, as they will be relieved of their responsibility for compliance with VAT rules;

- implementation of a single registration of VAT payers throughout the European Union: which is based on the existing “single window” model. For e-commerce, this reform will further reduce the need for VAT payers to register in other EU countries, if these persons wish to sell products in several states. Thanks to this reform, traders will be able to register in only one EU state, selling products in several EU countries [294].

Overall, these reforms should help member states collect up to €18 billion more in VAT revenue per year over the next ten years. The companies will be able to save 5 billion euros per year in total costs over the same period.

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Currently, businesses trading in European Union member states must submit a so-called “final return” to their national tax authority, which provides an overview of the goods and services they sold to businesses in other EU member states during that period and which taxable in that state. This information is then sent to other member states, which helps tax authorities to ensure that VAT is recorded and remitted correctly. However, in some Member States, companies are currently required to complete summary reports only four times a year. As VAT fraud can occur discretely, such reporting requirements prevent authorities from quickly identifying suspicious or fraudulent transactions. Information does not always reach other member states in time – at best, up to four months after the breach. Also, the information is not sufficiently detailed, which seriously reduces the ability of member states to fight against criminal VAT evasion.

Some countries of the European Union have already implemented digital VAT accounting in real time, which allows detection of fictitious transactions. But such fragmentation in the implementation of digital technologies can only increase the fiscal and administrative burden on business and reduce the effectiveness of international control in the field of universal excise duty administration.

In the case of the implementing of such innovations, EU companies will automatically inform their tax administrations about the tax base and value added tax when issuing electronic invoices. Accordingly, there will be no need to submit monthly reports because this information will be available online, as is done now. Such electronic administration of value added tax will also provide an opportunity to further automate your business processes and optimize supply logistics. In addition, this approach will ultimately contribute to the harmonization of VAT administration through the spread of such an electronic invoicing system to all EU countries. Ukraine, with its desire for integration, should prepare for such a digital administration system by creating a similar system in Ukrainian practice. It would allow to integrate the Ukrainian system with the European one in the future with minimal costs and difficulties.

That is, Ukraine should move in a similar direction of reform. The implementation of an electronic administration into the VAT collection system would strengthen the ability of state bodies to control fictitious transactions and tax liability minimization transactions. On the other side, the elements of an electronic administration of registration of tax invoices in Ukraine can be used in European reforms to minimize tax gaps in VAT of EU countries. It should be noted that at certain stages of the existence of such an electronic administration system in our country, small and medium-sized businesses often faced blocking of tax invoices and, as a result, restricted on conducting an economic activity. Obviously, given the problem of doing business in the conditions of war and post-war reconstruction, there should

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be no restrictions on doing business by small and medium-sized businesses. Small entrepreneurs are in fact self-employed and will solve two problems at the same time – increase employment with minimal state participation in this and develop the economy and state revenues in the end.

It is known that EU countries approach the use of the preferential VAT rate in different ways: some administer VAT at two rates, others at three. Currently, VAT is administered in our country at four rates: 0, 7, 14 and the basic rate of 20 %. Although the rate of 14 % is applied to agricultural goods, but we are talking about raw agricultural products and not directly related to food products. In Ukraine, even before the war, there were discussions about the feasibility of implementing a reduced rate for food products. The initiators of such changes were primarily the manufacturers of such products. Opponents substantiated the negative consequences of using a reduced rate for such products and talking about the loss of budget revenues and pessimistic expectations regarding the reduction of prices for such products. It is clear that the implementing of a preferential 7 % rate for fuel supply operations during the war and in the conditions of a shortage of fuel resources was expedient and effective. There are no prospects for the existence of such a rate in the post-war period if we compare it with constant improvement of environmental standards in the EU. So, the same processes await Ukraine in nearest future.

The war in Ukraine and the problem with the export of grain from the country demonstrated to the whole world the importance of Ukraine in the global chain of trade relations. And even if the result of using a reduced tax rate will not decrease in the price of food products, the profits received by such enterprises will most likely work for the development of the national economy. Therefore, as in European VAT taxation, legal norms should be implemented in national practice regarding the application of a reduced VAT rate for the supply of certain groups of goods, along with the preservation of the zero and basic rates. Such groups of goods include the supply of food, agricultural products, and medicines. The implementation of this benefit should be supplemented by state control over the establishment of prices for essential products. The application of a reduced rate will increase the opportunities for the national producer in entering on the European market.

In the legal regulation of VAT administration in the European Union, in addition to the use of the basic and zero rates, countries are allowed to use a reduced rate of at least 5 % for the sale of individual goods. Such goods may include food, beverages (except alcoholic beverages), live animals, plant seeds and ingredients intended for the preparation of food, medicines, passenger transportation, and others.

Considering the fact that in Ukraine in modern conditions, VAT is administered at rates of 0, 7, 14 and 20 %, another reform of VAT rates is debatable. On the one hand, we already have a reduced rate of 7 %, which, for example, applies to the supply of

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medicines based on the example of EU countries and does not apply to the supply of food products and other categories of goods established in the European Union. VAT in Ukraine is key from the point of view of the formation of budgetary resources, simultaneously creating opportunities for obtaining budgetary compensation by business entities.

The argument in favor of applying a reduced VAT rate for food industry enterprises is the possibility of creating competitive advantages of national enterprises both in the domestic consumer market and when entering the European consumer markets. But the proposal to establish a preferential rate for food products should be actualized only under the condition of stabilization of fiscal revenues in the post-war period and under the condition of an urgent need to stimulate the Ukrainian food industry. Such reforming could be carried out only after forecasting and planning of potential budget losses from a decrease in VAT revenues and an increase in the costs of its administration, as well as a result of forecasting an increase in revenues from income taxation of economic entities. Arguments regarding a potential reduction in the price of food products as a result of the possible application of a reduced VAT rate seem unlikely taking into account the traditions of Ukrainian business. Instead, enterprises that could benefit from the reduced VAT rate would have to pay more corporate income tax.

Negative consequences for the economy and state finances were caused by the authorities' decision to abolish taxation on the import of goods. (Fig.1.3).

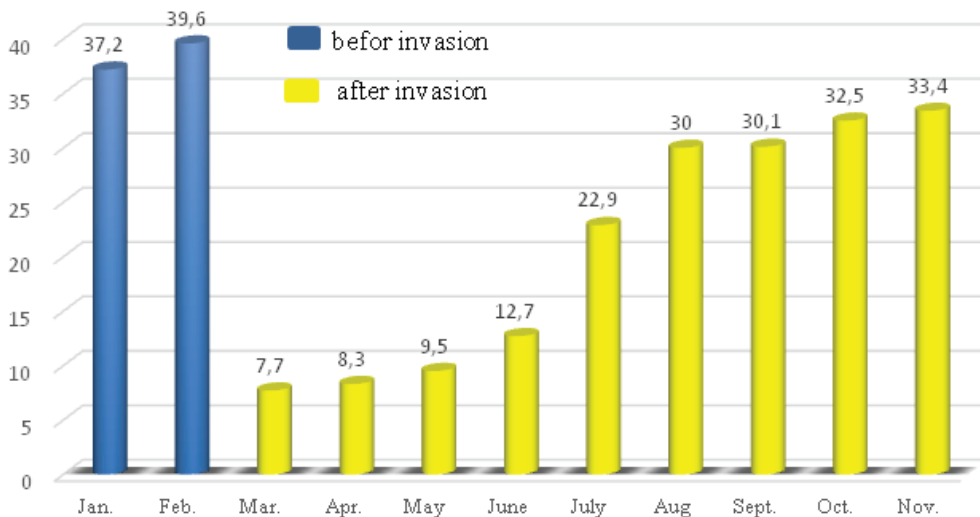


Fig.1.3. Budget revenues of customs payments in Ukraine for 11 months of 2022, UAH billion

Source [416].

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During March and June 2022 in Ukraine, there was duty-free import of vehicles, as a result of which the budget did not receive significant tax revenues of indirect taxes (VAT, excise, customs duties). The main motivation for the implementation of such a benefit was based on the thesis that a significant part of Ukraine's car fleet was lost during the war. But it would be quite risky to import a car during the period of hostilities to those territories where hostilities are taking place. As a result, citizens who lived in relatively peaceful regions and citizens who had the appropriate financial possibilities took advantage of this benefit. According to calculations, more than 200.000 cars were imported during this period, and budget losses amounted to UAH 26.1 billion. in 2022 [318]. In addition, the increase in imports due to duty-free import exerted additional pressure on the stability of the Ukrainian hryvnia, which the central bank had to compensate for through appropriate currency interventions.

In the second quarter of 2022, tax benefits for importing products almost doubled the revenue from customs payments. Since July 2022, when this preference was canceled, the income has actually doubled compared to July.

Prospects for improving the VAT administration system in Ukraine include the automation of VAT reporting verification in the aspect of minimizing and canceling on-site inspections, automatic VAT returning in a short period of time. Ukraine authority should follow the experience of the European Union countries. Online registration of goods supply operations should in the long run lead to the rejection of the need to submit monthly VAT reports, and all records should be kept instantly for each transaction.

Specific excise duties do not have such a broad tax base in comparison with value-added tax. They are mainly applied for highly liquid and monopoly goods. The history of the modern excise tax of Ukraine dates back to the beginning of independence, when in 1992 it was first regulated by the Decree of the Cabinet of Ministers of Ukraine. In the process of its evolution, both the legal ground and the base, objects and elements of this tax have changed several times. And with the beginning of Russia's armed aggression, Ukraine was also forced to change the elements of the national excise tax in order to restore the economy through the introduction of additional preferences.

Ukraine could independently determine the policy in the field of tax regulation of excise goods until the moment of declaration of European integration aspirations. Ukraine's signing of the Association Agreement in 2014 and obtaining the status of a candidate for EU accession requires the harmonization of a number of legal norms, including in the field of specific excise taxation.

The development of its own specific excise taxation, separated from EU policy and taking into account national traditions, has led to the fact that Ukraine has become a kind of "offshore" for the production of excise tobacco products that

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are harmful to human health. This contributed to the development of production facilities in Ukraine, which supplied cigarettes to the Ukrainian and international consumer markets. In addition, counterfeit cigarettes were transported from Belarus to European sales markets through Ukraine. And therefore, such uncontrolled circulation led to significant fiscal losses in the EU countries and Ukraine and contributed to the filling of the markets with cheap and harmful to human health goods. In general, the differentiation in approaches to taxation between the European Union and Ukraine is inherent in other excise goods as well.

The national legal regulation of excise tax in relation to all groups of excise goods is regulated by Chapter 6 of the Tax Code of Ukraine and the legislative basis of excise taxation and its harmonization in the EU is shown in Table 1.4.

Table 1.4. Current Directives of the European Union on excise tax

1.	Council directive 2008/118/EC of 16 december 2008 concerning the general arrangements for excise duty [44]
2.	Council Directive 92/83/EEC of 19 October 1992 on the harmonization of the structures of excise duties on alcohol and alcoholic beverages [48]
3.	Council Directive 92/84/EEC of 19 October 1992 on the approximation of the rates of excise duty on alcohol and alcoholic beverages [49].
4.	Council Directive 2011/64/EU of 21 June 2011 on the structure and rates of excise duty applied to manufactured tobacco (codification) [47]
5.	Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.[40]

In general, the EU's excise tax policy does not establish strict rules for the administration of excise duties within the EU. General rules for taxation of alcoholic and tobacco products are established. EU countries apply tax privileges to small productions of alcoholic beverages, taking into account the historical features and traditions of such productions in certain regions (for example, such privileges exist in France, Spain, Italy).

We should notice that certain steps have already been taken to harmonize specific excise taxation in Ukraine if to analyze the mentioned legal acts. Thus, Ukraine is already implementing a gradual increase in excise duty rates on cigarettes with a 20 % annual increase. This growth took place even before receiving the status of a candidate for joining the EU and was due, in our opinion, to the requirement of the European Union to prevent the unofficial movement of cigarettes into the territory of the Union countries. Such counterfeit movement was manifested due to a significant difference in the prices of cigarettes in European countries and Ukraine. And precisely the excise tax is and should be an available state tool for regulating the price policy for this type of goods. Under such circumstances, the increase in excise

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tax rates became politically and fiscally beneficial, and therefore the specific excise tax in our country, not having a broad tax base, began to play a significant role in budget revenues. In Ukraine, the excise tax took the 3rd place in terms of revenue to the budget (10.8 %) in 2021, ahead of the income tax, local taxes and other sources of tax revenue. The value added tax took the 1st place in terms of revenue (32.3 %). In 2nd place was personal income tax (21 %). This trend is not similar to the practice of EU countries, in which this tax is regulatory, not fiscal in nature. Excise taxes turned out to be a significant fiscal source in Ukraine taking into account the existing system of budgetary VAT returning.

It is worth noting that a significant share of the excise tax in tax revenues was affected by the taxation of the import of vehicles, which are also subject to taxation. The liberalization of the tax regime for the import of vehicles actually oversaturated the Ukrainian automobile market with those cars that contradict the environmental requirements of the European Union. In fact, cheap and old vehicles were exported from Europe. Authorities of Ukraine did not create an effective vehicle recycling system during importing them. They also unprepared transport infrastructure for such a large number of cars. Authorities should have to solve all these problems in one way or another on the way to joining the European Union.

And the tendency to constantly increase excise tax rates on tobacco products and alcoholic beverages can lead to an increase in the unofficial circulation of excise products. Therefore, the policy of excise tax regulation should be as balanced as possible and take into account the income of consumers of excise products. Such an approach:

- will hinder the increase in the availability of such goods;
- will prevent the increase in the consumption of goods that are harmful to the health of the population and the environment;
- will reduce the shift of demand to the shadow part of the circulation of excise goods;
- will prevent the formation of an excessive tax burden on producers of such excise goods.

The difference between the Directives of the European Union and the norms of the Tax Code of Ukraine concerning the administration of the excise tax helps us to note the differences that still exist in determining the date of occurrence of tax obligations – according to Directive 2008/118/EEC, obligations arise during consumption in the relevant state where it takes place consumption; according to the norms of the Tax Code of Ukraine, a tax liability can arise (excise tax can be paid) within 15 days after receipt of excise tax stamps.

EU directives establish preferences for small producers of alcoholic beverages in their own countries. The norms of the Tax Code of Ukraine do not create competitive

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advantages for producers of such drinks in Ukraine. Therefore, it is worth taking into account such benefits in the national tax legal field in the future.

The norms of Directive 2011/64/EU define the types of cigarettes that may be subject to excise tax somewhat more narrowly than the Tax Code of Ukraine. In this aspect, we believe that the norms of the Tax Code are more progressive and do not require harmonization with European legal norms, as they take into account modern types of smoking (for example, tobacco products for electric heating, liquids used in electronic cigarettes).

The norms of Directive 2003/96/EC are partially taken into account in the Tax Code of Ukraine. However, there are a number of differences. In Ukraine, a different approach to the taxation of energy resources is used, which does not depend on the directions of their use. At the same time, in the European Union, energy products are subject to excise tax only if they are used as motor fuel or heating fuel. In addition, the content of the Tax Code of Ukraine shows the almost complete absence of tax benefits for such energy products, which would increase regulatory properties of the tax.

Ukrainian legislation also does not provide the possibility of applying differentiated tax rates to energy products – when the differentiated tax rate is directly related to the quality of the product, or when the differentiated rates depend on the level of quantitative consumption of electricity and energy carriers used for heating. No tax preferences are provided even if such fuel is used by local public passenger transport, for garbage removal, disabled people, ambulance; energy, commercial and non-commercial use of products and electricity, as specified in Directive 2003/96/EC.

A positive thing in the post-war period should be the differentiation of fuel rates according to certain criteria (the content of sulfur, lead, biocomponents, and other harmful substances), which will help to regulate the negative impact on the surrounding natural environment from the consumption of different types of fuel.

It is also necessary to provide for the applying of preferential taxation in order to stimulate small enterprises and support the production of the national product in the future. It is necessary to form an appropriate legal framework for electronic commerce and supply of excise products to consumers. Such measures will contribute to the legalization of activities in this area, increase the volume of product sales and, as a result, increase the volume of tax revenues.

It is necessary to extend digitalization to the administration of all groups of excise goods, and not only to the sale of fuel. In particular, it is appropriate to introduce digital marking.

And the implementation and appropriate setting of a complex information system (through invoicing) in relation to excise duty, following the example of the EU project, would contribute to reducing the administrative costs of manufacturers,

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suppliers, and consumers of excise products and would allow to receive information on excise operations in real time. It also would facilitate control over such operations by tax authorities and would minimize illegal turnover in this area.

It should be important in the post-war period to implement a favorable tax regime for enterprises that use environmentally friendly technologies in production and support those mines that produce wind or solar electricity.

Adaptation of excise taxation of alcohol and tobacco products in wartime conditions in Ukraine requires a balanced approach. Ukraine permanently increased excise tax rates on alcohol and tobacco products when started to do this from the second decade of the 21st century. At the same time, both fiscal and deterrent functions were ensured. The result was an increase in prices for such products. At the same time, many consumers switched to the consumption of a cheaper and lower quality product due to a lack of funds and the cost of alcohol and tobacco. From a fiscal point of view, the budget receives more and more funds from excise taxes. However, the consumer focuses on products that are more dangerous for health.

In the future, it is worth implementing excise taxes on sweet carbonated drinks, energy drinks, sweet coffee drinks or any other drinks containing fructose or sucrose into the field of specific excise taxation. This will also contribute to increasing their price and, as a result, in addition to the fiscal effect, will reduce the consumption of such unhealthy products. Such taxes will counteract the development of such diseases as obesity, caries, the development of cardiovascular diseases, intestinal diseases, etc.

Even before the war, there was a great risk of a sharp increase in excise duty rates in Ukraine. Because we border Belarus and Russia, where these rates are much lower, and this affected the illegal circulation of alcohol and tobacco products from these countries. These products were illegally distributed and sold on the territory of Ukraine. And even now, during the war, you can buy Belarusian-made cigarettes at a significantly lower price than in supermarkets or official outlets. In the “black markets”, or from under the shelves of shops, sellers sell tobacco and alcoholic products of the occupiers at prices twice lower than the market prices. They don't pay taxes to the budget during this activity. The Ukrainian consumer buys these products due to low incomes and the free circulation of these products, because the minimum price of a package of official cigarettes is UAH 60, and contraband cigarettes is UAH 20–30, and the same with alcohol, the official price of a 0.5 liter bottle in stores is more than UAH 90, and twice as cheap on the black market. There also the problem of control due to the impossibility of that action on borders in Donetsk and Luhansk regions, from where smuggling also came and had a negative effect on the circulation of contraband. Moreover, these products crossed borders in Zakarpattia, Lviv, and Volyn regions and were imported into EU countries. That allows you to get excess

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profits from such shady activities and causes damage to the budgets of countries, and endangers people's lives. In the future, the taxation of both conventional tobacco products and so-called electronic cigarettes should be increased to the same extent. After all, it has been scientifically proven that electronic cigarettes also directly harm their users and others.

In the further reform of excise taxation of alcohol and tobacco products, a sharp increase in excise duty rates should be carefully approached. It is necessary to remove contraband cigarettes and alcohol, which are sold freely in Ukraine despite the war (thereby supporting the occupier), to prevent it from entering our territory state with subsequent export to EU countries.

In general, the strategic task of harmonizing the excise taxation of alcohol and tobacco products in Ukraine with the practice of the European Union should be the approximation of the market value of the price of these products due to taxation to the average in Europe. But such reforming should be carried out gradually with reference to the growth of individual incomes of citizens and the country's GDP. Otherwise, the high price of such products at low levels of income will lead to the consumption of cheap and low-quality products, which will have an even worse effect on the health of the population of Ukraine. The high price will also contribute to the unofficial circulation of these products on the territory of Ukraine, which, in addition to harming health, will cause significant fiscal losses. Therefore, another important step in the harmonization of excise taxation of alcohol and tobacco in Ukraine is to ensure strict control and responsibility for the import of these products through all sections of the customs border of Ukraine. Considerable attention in this harmonization should be paid to the issue of depersonalization of such control due to further implementation of digital technologies and automation of such control.

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In the process of foreign trade, the state can apply various tools for regulating export-import operations. One of these tools is customs regimes, thanks to the application of which the procedure for performing customs formalities, the need to obtain various types of permits from authorities, compliance with the requirements of legislation regarding the arrangement of premises when using certain types of customs regimes, the terms of stay of goods in customs regimes, the procedure for taxation of goods, are determined, that are in different customs regimes, with mandatory determination of their customs status.

In the process of customs clearance of goods and fulfillment of customs formalities, customs authorities may place goods in different customs regimes, depending on their country of origin, availability of accompanying documents, current restrictions or prohibitions on the importation of goods into the customs territory of Ukraine (export outside the customs territory of Ukraine), permits for placing goods in a certain customs regime.

Placement of goods (vehicles) in a certain customs regime determines the order and purpose of moving goods, fulfillment of customs formalities, determination of the customs status of goods, application of non-tariff measures of foreign exchange regulation, formation of the customs value of goods and calculation of tax obligations in relation to customs payments, terms of application of the customs regime etc.

According to Clause 25 of Article 4 of the Customs Code of Ukraine [54] customs regime is “a complex of interrelated legal norms that, in accordance with the stated purpose of moving goods across the customs border of Ukraine, determine the customs procedure for these goods, their legal status, taxation conditions and determine their use after customs clearance”.

It is important to note that there are no industrial-type free customs zones in Ukraine anymore. Therefore, the presence of such a customs regime in the classifier does not meet the requirements of the legislation.

By order of the Ministry of Finance of Ukraine dated September 20, 2012 No. **1011** [252] the Classifier of customs regimes to be applied in Ukraine was approved (Table 1.5).

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Table 1.5. Classifier of customs regimes, compiled according to [252]

Customs regime code	The name of the customs regime
10	Export
11	Re-export
12	Re-export of processing products obtained from Ukrainian equivalent goods before the importation of foreign goods for processing into the customs territory of Ukraine or before the completion of processing operations of foreign goods
21	Free customs zone (service type)
24	Free customs zone (commercial type)
25	Free customs zone (industrial type)
31	Temporary importation
32	Temporary removal
40	Imports
41	Reimport
42	Import of processing products, obtained from foreign equivalent goods, before the export of Ukrainian goods for processing outside the customs territory of Ukraine or before the completion of processing operations of Ukrainian goods
51	Processing in the customs territory
52	Processing in the customs territory (for foreign equivalent goods)
61	Processing outside the customs territory
62	Processing outside the customs territory (for Ukrainian equivalent goods)
72	Duty-free trade
73	Customs warehouse (for Ukrainian goods)
74	Customs warehouse (for foreign goods)
75	Refusal in favor of the state
76	Destruction or destruction
80	Transit is passable
81	Internal transit
82	Internal transit between a customs authority located on the territory of Ukraine occupied by land and artificial islands, installations or structures created in the exclusive (maritime) economic zone of Ukraine and in the reverse direction)

Scientists have different approaches to the classification of customs regimes (Table 1.6).

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Table 1.6. Approaches to the classification of customs regimes

Scientist	Approach to classification
1	2
V. Naumenko [223]	<p>Group I – customs regimes that are applied to the main mass of objects of foreign economic operations – import, export, re-import, re-export, free customs zone;</p> <p>Group II – customs regimes that are used within the scope of providing a whole range of services in the field of foreign trade - customs warehouse, duty-free trade, transit, temporary importation, temporary exportation. This group also includes customs regimes of processing in the customs territory of Ukraine and processing outside the customs territory of Ukraine;</p> <p>Group III – customs regimes that are applied in the event of termination of foreign trade operations due to the impossibility or ineffectiveness of further actions with goods on the domestic market – destruction or destruction, refusal in favor of the state</p>
A. Dubinina [71]	<p>1. completed customs regimes – import, reimport, export, reexport, free customs zone, destruction or destruction, refusal in favor of the state;</p> <p>2. unfinished customs regimes – temporary import, temporary export, customs warehouse, duty-free trade, processing in the customs territory, processing outside the customs territory, transit</p>
O. Hrebelnyk [128]	<p>1) regimes used in the implementation of the main volume of foreign trade operations (customs regimes of completed commercial operations) – import, export, reimport and reexport;</p> <p>2) customs regimes under which the movement of goods across the border is combined with the implementation by customs authorities of specific operations in the interests of relevant organizations or individuals with the provision of certain services for them – regimes of customs warehousing and duty-free trade;</p> <p>3) customs regimes within which goods are moved across the border in connection with their processing in another country – regimes of processing in the customs territory, processing outside the customs territory;</p> <p>4) regimes used in the termination of foreign economic operations – regimes of denial in favor of the state and destruction or destruction;</p> <p>5) regimes, the content of which is reduced to the fact that the import of foreign goods takes place without payment of customs taxes, as well as without the application of non-tariff regulation measures (quota, licensing) to these goods – customs regimes of transit, free customs zone and customs warehouse</p>
N. Osadcha [263]	<p>1) regimes that affect the balance of the trade balance – import and export;</p> <p>2) globalization – transit; storage; temporary importation; processing; free zones; re-export, re-import;</p> <p>3) regimes, the use of which is determined by the need for the development of the national economy – duty-free trade, destruction and destruction, refusal in favor of the state</p>

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End of table 1.6

1	2
R. Lemekha [186]	<p>1) by prevalence and frequency of use (main and additional);</p> <p>2) by impact on Ukraine's trade balance: determinative (export, import, transit) and technical-procedural (temporary export, customs warehouse, free customs zone, duty-free trade);</p> <p>3) by purpose of application: oriented to the domestic market (import, reimport, temporary export, processing outside the customs territory, refusal in favor of the state); oriented to foreign markets (export, re-export, transit, temporary importation, processing in the customs territory); universal (customs warehouse, free customs zone, duty-free trade, destruction or destruction)</p>
M. Melnyk [209]	<p>1) simple (import, export, destruction or destruction, refusal in favor of the state. This division is based on the fact that from the moment of obtaining permission for their use by the customs authority, the latter actually complete their operation)</p> <p>2) ongoing (temporary import regime, temporary export regime, transit, customs warehouse, duty-free trade, etc., i.e. those in which the goods can be kept for a certain time)</p>
O. Chuprina [32]	<p>1) customs release regimes (import (release for free circulation), export (final export), re-import, re-export);</p> <p>2) customs regimes of conditional release (temporary import, temporary export, transit, customs warehouse, duty-free trade);</p> <p>3) customs processing regimes (processing in the customs territory, processing outside the customs territory);</p> <p>4) extraterritorial customs regimes (free customs zone);</p> <p>5) customs exclusion regimes (destruction or destruction of goods, refusal of goods in favor of the state)</p>

The customs regime has its own internal structure, which allows disclosure of its content and which represents the conditions, requirements and limitations of this customs regime (Table 1.7).

Table 1.7. Conditions, requirements and restrictions on the application of customs regimes [187]

Conditions	Requirements	Limitation
circumstances that determine the possibility of placing goods under a certain customs regime	actions, the implementation of which is possible to complete the customs regime	direct or indirect prohibitions on carrying out certain actions with the goods
The placement of goods under a number of customs regimes is allowed only with the permission of the customs authorities, obtaining which is also a condition of these customs regimes	An example may be a violation of transit terms	An example may be the prohibition of placing certain categories of goods under customs regime

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The main functions of customs regimes are:

1. Fiscal. Foreign exchange processes are connected, among other things, with the filling of the state budget due to customs payments (VAT, excise tax, duties). For the most part, this function involves tariff regulation measures that can directly affect the amount of tax liabilities.

One of the examples of the implementation of such a function was the cancellation of customs payments for the import of vehicles from April to June 2022, which led to significant losses of the budget of Ukraine during the war.

2. Regulatory. Presupposes mostly measures of non-tariff regulation (quotas, licenses, permits, certificates, etc.). At the same time, this function can be implemented not only by customs authorities, but also by other authorities (for example, the State Service of Ukraine for Product Safety and Consumer Protection, which has the right to carry out phytosanitary and veterinary control).

3. Protective. Provides for a number of measures related to the establishment of prohibitions and restrictions on the import of goods into the customs territory of Ukraine. This function is performed by the bodies of the Ministry of Economy of Ukraine, as well as the Interdepartmental Commission on International Trade, which is responsible for establishing special and anti-dumping duties, without the permission of the legislative body.

The procedure for performing customs formalities in accordance with the declared customs regime is regulated by the Customs Code of Ukraine [54] and the order of the Ministry of Finance of Ukraine “On the fulfillment of customs formalities in accordance with the declared customs regime” dated May 31, 2012 No. 657 [253].

Regulatory influence of the state on the application of customs regimes can be carried out in different ways.

1. Customs regime of import.

Every year, the Cabinet of Ministers of Ukraine approves the list of goods, the export and import of which are subject to licensing, and the quota for the corresponding year.

As of January 1, 2023, the following are subject to licensing: import of controlled substances (ozone-depleting substances and fluorinated greenhouse gases); import of goods and equipment that may contain controlled substances (ozone-depleting substances and fluorinated greenhouse gases); import of goods from the Republic of North Macedonia.

In order to carry out import operations from the Ministry of Economy of Ukraine, the following should be obtained: a permit (valid for 90 calendar days); license in automatic or non-automatic mode (such license is canceled during wartime).

Also, upon import, an international import certificate, a delivery confirmation certificate is required; end user certificate.

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It is also important to obtain a permit for the import of military or dual-use goods issued by the State Export Control Service of Ukraine.

2. Customs regime of reimport.

The main regulatory mechanism of the customs regime of reimport are the rules according to which goods can be placed in such a customs regime:

1) were exported outside the customs territory of Ukraine under the customs regime of temporary export and are imported into this territory until the expiration of this customs regime in the same condition in which they were exported, except for natural changes in their qualitative and/or quantitative characteristics under normal conditions transportation and storage, as well as changes allowed in the case of using such goods under the customs regime of temporary export;

2) were exported outside the customs territory of Ukraine under the customs regime of processing outside the customs territory and are imported into this territory before the expiration of this customs regime in the same state in which they were exported, except for natural changes in their qualitative and/or quantitative characteristics under normal conditions of transportation and storage;

3) were placed under the customs export regime and are returned to the person who exported them, in connection with non-fulfillment (improper fulfillment) of the terms of the foreign economic agreement, according to which these goods were placed under the customs export regime, or due to other circumstances that prevent the fulfillment of this contract, if these goods:

a) are returned to the customs territory of Ukraine within a period not exceeding six months from the date of their export outside this territory under the customs export regime;

b) are in the same condition in which they are registered under the customs export regime, except for natural changes in their qualitative and/or quantitative characteristics under normal conditions of transportation, storage and use (operation), as a result of which defects were discovered that caused the reimport of the goods.

3. Customs regime of export.

Every year, the Cabinet of Ministers of Ukraine approves the list of goods, the export and import of which are subject to licensing, and the quota for the corresponding year. As of January 1, 2023, the following are subject to licensing: export of controlled substances (ozone-depleting substances and fluorinated greenhouse gases); export of goods and equipment that may contain controlled substances (ozone-depleting substances and fluorinated greenhouse gases); export of mineral fertilizers.

In order to carry out export operations, the following must be obtained: a permit for the export of military or dual-use goods; license in automatic or non-automatic mode (such license is canceled during wartime) [220].

Also, when exporting, you need to get a EUR.1 certificate if the invoice value of the exported goods exceeds 6.000 euros.

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When exporting, it should be taken into account that some goods are subject to export duty: live cattle and leather raw materials; oil seed; scrap metal; scrap alloyed ferrous and non-ferrous metals; natural gas.

Also, an important export regulatory mechanism is the presence of bans and restrictions, which are also related to the state of war in Ukraine.

4. Customs regime of re-export.

In order to carry out re-export operations, the following should be obtained from: a permit for the re-export of military or dual-use goods; permission to re-export goods of Ukrainian origin; permission to re-export goods of foreign origin.

5. Customs regime of the free customs zone.

To open a free customs zone of service or commercial type, you should obtain permission from the customs authorities. Every month, holders of a free customs zone must submit a Report on the movement of goods in a free customs zone. Currently, there is one free customs zone in Ukraine, which is located in the Volyn region.

6. Customs regime of destruction or destruction.

The owners of the goods must obtain permission from the customs authorities to place the goods under such customs regime.

Subject to destruction or destruction (Fig. 1.4).

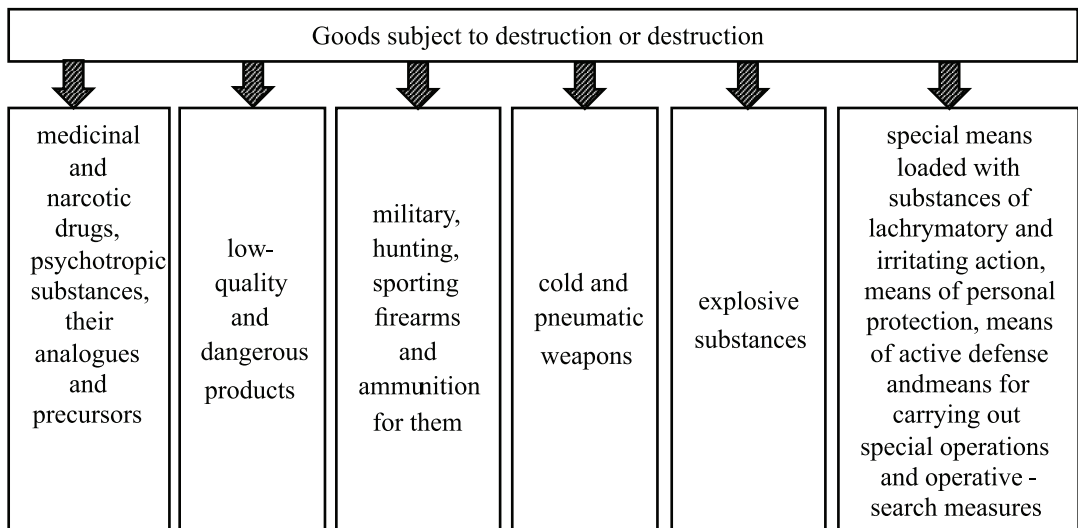


Fig. 1.4. Goods subject to destruction or destruction

7. Customs regime of refusal in favor of the state.

The owners of the goods must obtain permission from the customs authorities to place the goods under such customs regime.

The following goods cannot be placed under such customs regime (Fig. 1.5).

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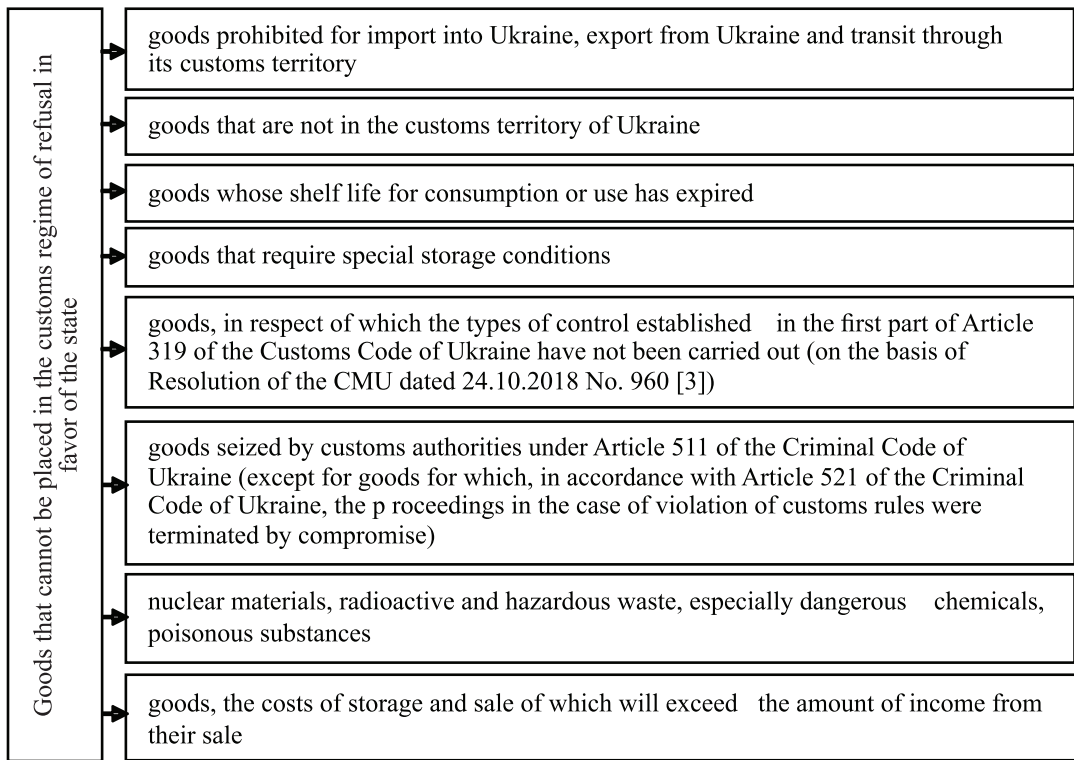


Fig. 1.5. Goods that cannot be placed in the customs regime of refusal in favor of the state

8. Customs regime of temporary importation.

This customs regime provides for the application of a conditional partial exemption from taxation, when 3 % of the amount of customs payments is paid, which would be payable in the event of the release of these goods into free circulation in the customs territory of Ukraine, calculated on the date of placing them under the customs regime of temporary importation.

The term of temporary importation of goods should not exceed three years from the date of placing the goods under the customs regime of temporary importation.

Ensuring compliance with the requirements of the customs regime of temporary importation is carried out by providing security for the payment of customs payments (Fig. 1.6).

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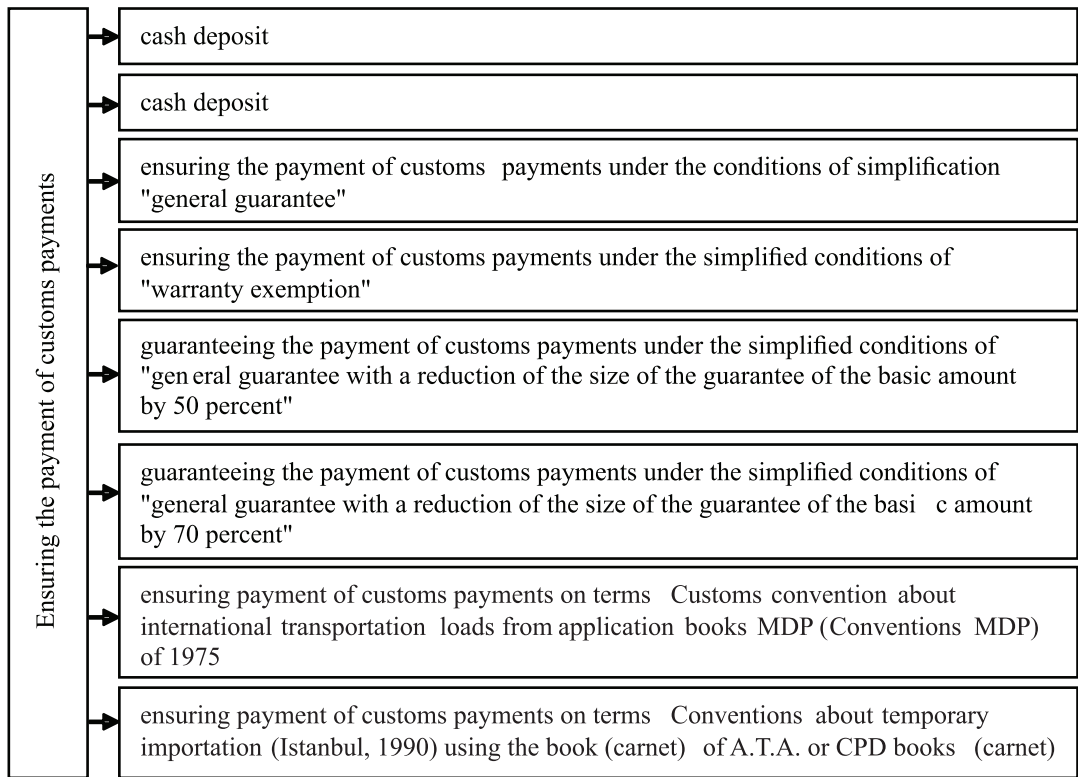


Fig. 1.6. Ensuring the payment of customs payments

9. Customs regime of temporary export to the customs territory of Ukraine.

A person who wishes to place goods under this customs regime must obtain permission from the customs authorities.

The term of temporary removal of goods should not exceed three years from the date of placing the goods under the customs regime of temporary export.

10. Customs regime of the customs warehouse.

Customs warehouses can be of open or closed type, and their keeper can only be a resident (including a customs broker). To open a customs warehouse, you must obtain a permit from the customs authorities. The keeper of the customs warehouse is responsible for quarterly reporting on the movement of goods in the customs warehouse.

Any goods can be placed in the customs regime of the customs warehouse, with the exception of:

- goods prohibited for import into Ukraine, export from Ukraine and transit through the territory of Ukraine;
- goods whose shelf life for consumption or use has expired;
- goods arriving in Ukraine as humanitarian aid;
- live animals;

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– electricity moving through power lines.

11. Customs regime of duty-free trade.

Duty-free shops carry out trade in all types of food and non-food goods, except for goods that, according to the law, are prohibited for import into Ukraine, export from Ukraine and transit through the territory of Ukraine, and goods under commodity headings 2701-2716 in accordance with UCT ZED (mineral fuels; oil and products of its distillation; bituminous substances; mineral waxes).

To open a duty-free shop, you must obtain permission from the customs authority. Duty-free shop owners must report quarterly on the movement of goods in the shop.

The legislation contains a highly controversial provision that allows customs authorities to conduct an inventory of goods in a duty-free shop. This violates the rights of the duty-free shop owner.

Any goods are placed under the customs regime of duty-free trade, except for goods prohibited for import into Ukraine, export from Ukraine and transit through the territory of Ukraine, goods entering Ukraine as humanitarian aid, live animals.

One of the shortcomings of customs legislation is the absence of a rule regarding the period of stay of goods in a given customs regime.

12. Customs regime of processing in the customs territory of Ukraine.

In order to apply such a customs regime, a permit must be obtained from the customs authorities.

If justified, the Cabinet of Ministers of Ukraine has the right to determine:

- goods, when placed in the customs regime of processing in the customs territory, security for the payment of customs payments is provided;
- processing products and/or goods, the processing products of which are subject to mandatory re-export outside the customs territory of Ukraine;
- the minimum ratio of the value of foreign and Ukrainian goods for certain categories of goods subject to processing operations;
- the list of goods that cannot be accepted for processing for free circulation in the customs territory of Ukraine;
- goods, the placing of which in the customs regime of processing in the customs territory is prohibited.

The period of processing of goods in the customs territory of Ukraine should not exceed 365 calendar days.

Resolution of the Cabinet of Ministers of Ukraine [348] the list of goods is defined: the placing of which in the customs regime of processing in the customs territory of Ukraine is prohibited (five commodity items);

which cannot be accepted for processing for free circulation in the customs territory of Ukraine (one commodity item).

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13. Customs regime of processing outside the customs territory of Ukraine.

In order to apply such a customs regime, a permit must be obtained from the customs authorities.

During the processing of goods outside the customs territory of Ukraine, operations may be carried out:

- actual processing of goods, including: processing, assembly, disassembly, use of individual goods that contribute to or facilitate the process of manufacturing processed products;
- repair of goods, including modernization, restoration and adjustment, calibration.

Goods (except those exported for the purpose of repair) which were exempted from taxation by customs payments during importation shall not be placed in the customs regime for processing outside the customs territory.

The Cabinet of Ministers of Ukraine has the right to determine [348]:

1) products processing (7 product items), leftovers processing (10 product items), as well as goods, processing products or processing residues, which are subject to mandatory return to the customs territory of Ukraine and release into free circulation;

2) minimum ratio of the value of Ukrainian and foreign goods (15 commodity items) for certain categories of goods subject to processing operations outside the customs territory of Ukraine (the size of the ratio is from 80 to 90 %).

Goods, the products of processing of which are determined by the Cabinet of Ministers of Ukraine as mandatory to return to the customs territory of Ukraine, are exported under the customs regime of processing outside the customs territory with the provision of security for the amount of their value. The guarantee is carried out by providing the customs with a financial guarantee (individual or general) in the form of a document or in the form of depositing a cash deposit on the relevant account.

The period of processing of goods outside the customs territory of Ukraine should not exceed 365 calendar days.

Processing products (except those subject to conditional full exemption from taxation) are subject to a partial exemption from customs duties, according to which the positive difference between the amount of customs duties charged on the processing products and the amount of customs duties that would have been payable is payable in case of import of relevant goods that were exported outside the customs territory of Ukraine for processing.

14. Customs regime of transit.

The customs regime of transit is applied to goods, vehicles of commercial purpose, which are moved:

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– through transit from the point of entry (passage) into the customs territory of Ukraine to the point of exportation (passage) outside the customs territory of Ukraine (including within the limits of one point of passage through the state border of Ukraine);

– internal transit or cabotage.

The following terms of transit transportation are established depending on the type of transport (Fig. 1.7).

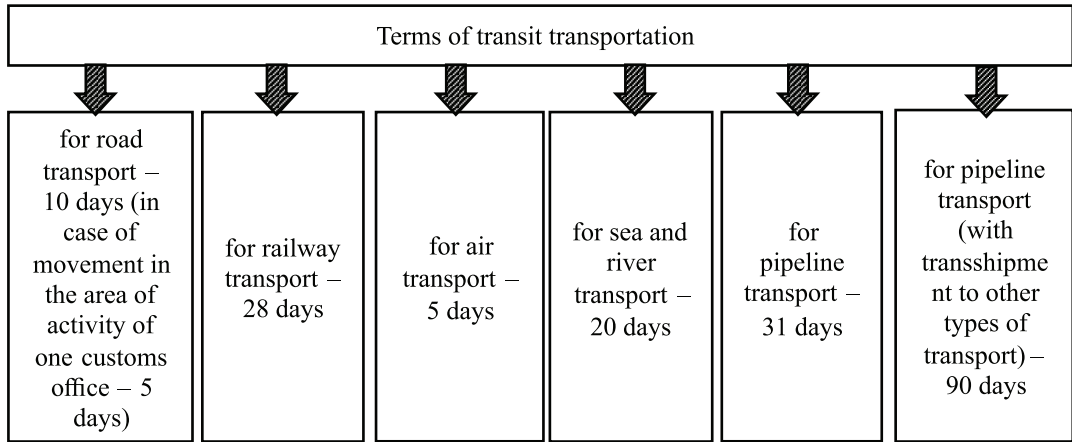


Fig. 1.7. Terms of transit transportation

When performing customs formalities under certain customs regimes, various risks may arise (Table 1.8).

Table 1.8. Risks of application of customs regimes, compiled according to [221]

Customs regime	Risks of applying the customs regime for the state	Risks of applying the customs regime for payers of customs payments
1	2	3
Imports	The possibility of contraband and low-quality goods entering the customs territory of Ukraine due to the lack of modern means of technical control	The payment of customs fees depends on the method of determining the customs value, which may increase the final amount of customs fees. There are risks of violation of settlement terms in the foreign exchange (in the case of prepayment for imported goods), as well as the risk of non-compliance with the principle of «outstretched hand» in transfer pricing
Reimport	Control over the condition of goods that are returned to Ukraine after their exportation	Loss of the opportunity to receive a budget VAT refund for goods that were placed under the customs regime of export and returned to Ukraine under the customs regime of reimport

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Continue of table 1.8

1	2	3
Export	Necessity of payment of budgetary VAT reimbursement to exporters	<p>Payment of export duty in case of export of scrap and waste of ferrous metals, livestock and leather raw materials, some types of oil crops, natural gas.</p> <p>There are risks of violation of settlement terms in the foreign exchange (in the case when the shipment of the goods is the first event), as well as the risk of non-compliance with the principle of «outstretched hand» in transfer pricing.</p> <p>There may be problems with the application of Incoterms-2020. This is due to the EXW delivery condition, which provides for the transfer of ownership of the goods to the buyer at the seller's warehouse. To avoid problems during customs clearance, the customs declaration must be issued on behalf of the seller (exporter)</p>
Re-export	Control over the condition of goods that will be exported outside the customs territory of Ukraine after their export under the import regime	Obtaining a significant number of permits for the re-export operation
Transit	Control over compliance with transit transportation deadlines	The need to observe the terms of transit transportation. Payment of a single fee at checkpoints across the state border of Ukraine
Temporary importation	Control over compliance with the terms of temporary importation of goods into the customs territory of Ukraine	<p>The need to observe the terms of temporary importation</p> <p>Payment of a share of customs payments subject to conditional partial exemption from taxation</p> <p>Necessity of applying financial guarantees</p>
Temporary removal	Control over compliance with the terms of temporary export of goods outside the customs territory of Ukraine	The need to observe the terms of temporary removal
Customs warehouse	<p>Control over compliance with the conditions of storage of goods in the customs warehouse regime</p> <p>Control over the transfer of ownership of foreign goods</p>	<p>Obtaining permission to open a customs warehouse</p> <p>It is necessary to observe all conditions of storage of goods in the regime of the customs warehouse</p>
Free customs zone	Control over the movement of goods between different free customs zones	<p>Obtaining permission to open a free customs zone</p> <p>The need to pay export duty on the goods on which it is imposed</p>
Duty-free trade	Shadow schemes for the sale of excise goods at checkpoints	Failure to receive revenue from the sale of goods sold without VAT and excise tax

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End of table 1.8

1	2	3
Processing in the customs territory of Ukraine	Control of compliance with the deadlines for the processing of goods in the customs territory of Ukraine Control over the sale of processing products in the customs territory of Ukraine	Obtaining a permit for the processing of goods in the customs territory of Ukraine Application of guarantee measures Tax consequences in the sale of processing products
Processing outside the customs territory of Ukraine	Control of compliance with the deadlines for processing goods outside the customs territory of Ukraine Control over the sale of processing products outside the customs territory of Ukraine	The need to obtain a permit for the export of goods for processing outside the customs territory of Ukraine Application of guarantee measures
Destruction or destruction	Control over the types of goods that will be placed in this customs regime	Obtaining permission from the customs authority to apply this customs regime Restrictions on goods that can be placed under such customs regime
Refusal in favor of the state	Control over the types of foreign goods that will be placed in the customs regime	Obtaining permission from the customs authority to apply this customs regime Restrictions on goods that can be placed under such customs regime

As we can see, the application of various types of customs regimes entails risks for both the state and the entities of the FTA. The reduction of such risks can only take place under the condition of an effective customs policy of the state, which will take into account not only the requirements of foreign investors and creditors, but also provide for real levers of protection for national producers who carry out export operations and ensure the replenishment of the budget in the form of foreign exchange earnings.

In the process of applying customs regimes, there are mostly no tax consequences (Table 1.9).

Table 1.9. Tax consequences of applying customs regimes [221]

Customs regime	Toll	VAT	Excise tax
Imports	payable except for tax-exempt goods	is paid at the rates established by the Tax Code of Ukraine	is paid at the rates established by the Tax Code of Ukraine
Reimport	is exempt from taxation	is exempt from taxation, except for transactions involving the import of goods subject to VAT	is exempt from taxation, except for transactions involving the import of excise goods subject to VAT

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End of table 1.9

Customs regime	Toll	VAT	Excise tax
Export	is exempt from taxation with the exception of some goods	zero VAT rate	is exempt from taxation
Re-export	is exempt from taxation	is exempt from taxation	is exempt from taxation
Transit	is exempt from taxation	is exempt from taxation	is exempt from taxation
Temporary importation	conditional full and conditional partial exemption from taxation	conditional full and conditional partial exemption from taxation or taxation on general grounds	is exempt from taxation
Temporary removal	conditional full exemption from taxation	conditional full exemption from taxation	conditional full exemption from taxation
Customs warehouse	conditional full exemption from taxation	is exempt from taxation	is exempt from taxation
Free customs zone	export duty is paid on goods subject to export tax	is exempt from taxation	is exempt from taxation
Duty-free trade	export duty is paid on goods subject to export tax	is exempt from taxation	is exempt from taxation
Processing in the customs territory of Ukraine	is paid for the sale of processing products	conditional full exemption from taxation	is exempt from taxation
Processing outside the customs territory of Ukraine	conditional full and conditional partial exemption from taxation	are exempt from taxation and conditional full and conditional partial exemption from taxation is applied	are exempt from taxation
Destruction or destruction	conditional full exemption from taxation	conditional full exemption from taxation	are exempt from taxation
Refusal in favor of the state	is exempt from taxation	is exempt from taxation	is exempt from taxation

It should be stated that the state has a rather loyal approach to the calculation of tax liabilities when applying various types of customs regimes.

Ukraine's signing of the Association Agreement with the EU requires Ukraine to implement the norms of EU legislation in the "Customs Issues" sector.

Chapter 5 of the Agreement [17] was mainly devoted to customs issues and provided for the simplification of customs procedures:

- introduction of the authorized economic operator institute in Ukraine and its recognition by the EU (Article 76.1 (k) and Article 80 (i) of the Agreement);
- implementation in Ukraine and recognition by the EU of a single administrative document and Ukraine's accession to the common transit system of the EU, which

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are interconnected processes (Articles 76.1 (c) and 76.4 (b) and Annex XV to the Agreement);

– gradual bringing Ukrainian customs legislation into line with the EU customs legislation, in particular the provisions of the EU Customs Code.

Implementation of the Association Agreement is associated with certain problems. Undoubtedly, the state of war makes adjustments to this process, but even before that, the business side expressed certain comments regarding the implementation of the Agreement.

Yes, according to the results of the survey of the Institute of Economic Research and Political Consultations based on the results of 2021 [337] among businesses, the share of those who feel the positive impact of the Association Agreement between Ukraine and the EU on the company's activities has decreased. In 2021, 36.8 % of surveyed enterprises positively assessed the current impact of the Agreement (Fig. 1.8).

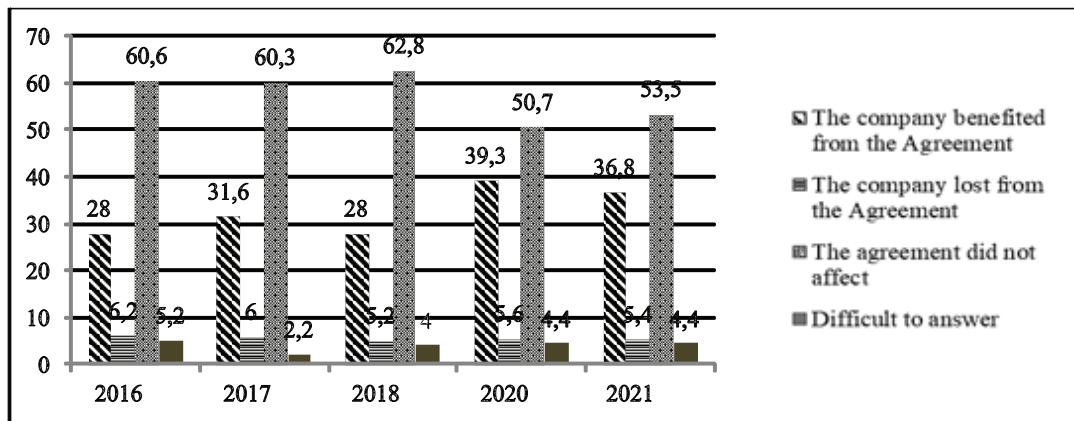


Fig. 1.8. Assessment of the impact of the Association Agreement [337]

At the same time, expectations of business entities from Ukraine's implementation of the tasks of the Association Agreement worsened in 2021. Thus, the share of enterprises that positively perceived the Association Agreement with the EU decreased from 45 % to 41 %, which indicates a certain dissatisfaction of business entities with the results of the Association Agreement on their activities, mainly due to the established quotas for the import of goods into the EU.

EU Customs Code [301] the application of customs procedures, not customs regimes, is regulated.

Article 5 of the EU Customs Code [301] three main types of customs regimes are established, which include: release for free circulation; export (export); special procedures (special procedures).

Special procedures according to Article 210 of the EU Customs Code include (Fig.1.9).

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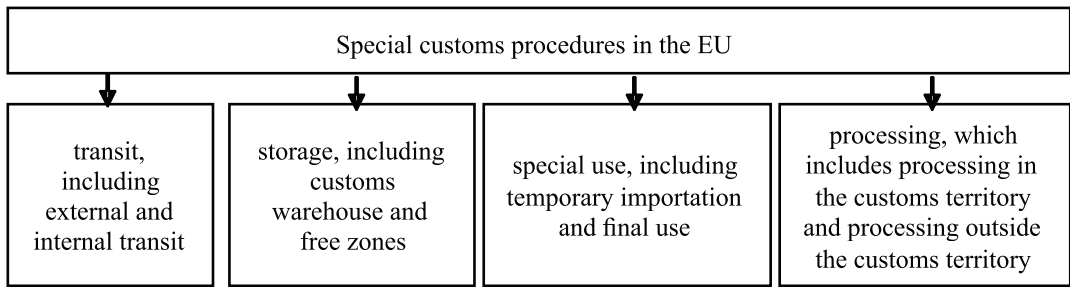


Fig. 1.9. Special customs procedures

This classification most accurately reflects the functional purpose of these procedures – taxation and application of non-tariff measures of economic policy. In accordance with this, two procedures are distinguished in which tariff and non-tariff regulation is applied in full – import and export, as well as “special procedures” that provide for exemption from such regulation under certain conditions.

Regulation of EU customs procedures looks more systematic in contrast to the order of application of customs regimes in Ukraine.

Let’s consider some features of EU customs procedures.

1. Customs procedure of release for free circulation.

Goods from third countries intended for circulation in the EU or for personal use or consumption in the customs territory of the EU are placed under the procedure of release for free circulation.

Release for free circulation includes:

collection of import duty;

collection of other fees in accordance with relevant applicable legislation regarding the collection of such fees;

application of trade policy measures and prohibitions and restrictions;

fulfillment of other formalities established for the import of goods.

In Great Britain, the customs procedure of free circulation is applied as follows [55].

The customs procedure of free circulation refers to the basic declaration of goods for internal use and free circulation by paying or accounting for customs duties, regardless of whether the imported goods are subject to customs duties, as well as any other import duties, regardless of whether preferential treatment is applied. duty rate

The stages of application of the customs procedure of free circulation in Great Britain are given in the Table 1.10.

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Table 1.10. Stages of the customs procedure of free circulation in Great Britain [55]

Stages	Characteristic
1	Goods are transported to the UK and unloaded from a ship or aircraft. They can be temporarily stored until the customs service clears them
2	The importing company/economic operator/declarant ensures that all necessary supporting documentation is available, ensuring that the cargo is not subject to any restrictions or prohibitions. Import licenses, certificates of origin and invoices are examples of supporting documents. After that, the products are submitted to the customs authority
3	the customs authority assesses the risk and, in some cases, inspects the products. If the items have passed the evaluation and inspection, the importing company is notified of the decision on their free circulation
4	The importing/declaring company shall pay or guarantee the payment of import duty and any other applicable charges. Along with customs duties, there are VAT, excise duties, and in some cases, anti-dumping duties
5	The customs body allows the release of products into free circulation

At the same time, exemption from payment of import duty is provided in the following situations:

- the goods are returned to the customs territory of the EU. For example, the goods must be returned to the customs territory of the EU within three years and re-cleared for free circulation. The goods must be in the same condition in which they were exported;

- inward processing of goods outside the EU occurs when goods from outside the EU are imported into the EU for repair or processing of goods. After processing, the goods can either be re-exported or released into free circulation after the normal process. At the same time, the declarant must obtain permission from the customs authority to use the internal processing mechanism.

sea products If an EU fishing vessel catches fish/products in the territorial waters of a non-EU country, these products are exempt from import duties. The same applies to goods produced on board such an EU vessel or factory.

The following customs procedure codes apply in Estonia (Table 1.11).

Table 1.11. Codes of customs procedures in Estonia [95]

Code	Characteristic
F01	exemption from payment of import duty on returned goods (Article 203 of the Customs Code)
F02	exemption from payment of import duty applicable to returned goods (special measures set out in Article 159 of the Delegated Regulation (EU) 2015/2446 on agricultural products)
F03	exemption from payment of import duty applicable to returned goods (special measures set out in Article 158 (3) of Delegated Regulation (EU) 2015/2446 (handling or processing)

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End of table 1.11

Code	Characteristic
F04	processed products that were initially re-exported from the customs territory of the Union after the internal processing procedure (Article 205 (1) of the Customs Code)
F05	exemption from import duty, value added tax and/or excise duty applicable to returned goods (Article 203 of the Customs Code and Article 143 (1) (e) of Directive 2006/112/EC). This additional procedure code is used if the exporter and importer of the goods are the same person

When drawing up a customs declaration for placing goods in the customs procedure for release into free circulation, the following features must be taken into account (Fig. 1.10) [95].

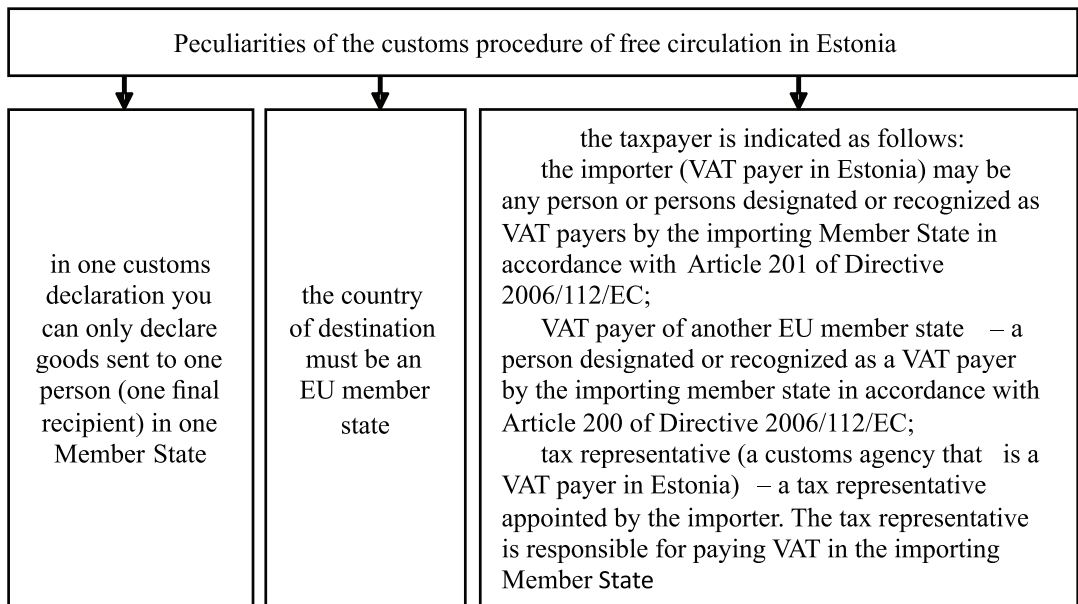


Fig. 1.10. Customs procedure of free circulation in Estonia

The following rules of the customs procedure of free circulation apply in Sweden [133].

The import declaration can be submitted in electronic form or in the form of the EAD (Single Administrative Document).

In order to make an import declaration, you must first classify the product, that is, determine the corresponding product code, and also find out whether a license or a special permit for import is required.

Upon import, the customs duty payable is calculated from the customs value of the goods. The customs value is usually based on the price paid to the supplier when he sold the goods to the EU, the cost of transport to the EU border and the cost of any transport insurance.

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If the customs value of the cargo will exceed SEK 206,600, the person must pay the customs duty and fill out a customs value declaration.

The following rules of free movement of goods apply in Poland [132].

The majority of Polish imports are not intended for direct consumption, but for capital goods necessary for production and industrial re-equipment. The most popular imported services include travel, business services, research and development, transport services, construction and insurance services.

Most goods are in free circulation between EU member states and can be easily moved without customs controls or duties. The exception is, of course, in the case of certain sensitive goods, such as tobacco, weapons, agricultural products, surveillance and goods dictated by quantitative restrictions. All EU member states follow a common trade policy on imports from third countries.

As a rule, import licenses are not required in the EU, but the Union has quantitative restrictions on the supervision of certain goods imported from certain countries.

The Polish Ministry of Economy issues permits and concessions for imports, as well as regulates quotas. However, other Polish ministries have special jurisdiction over such products as: tobacco (Ministry of Agriculture); permits for air, sea or road transport (Ministry of Transport); or natural resources (Ministry of Environmental Protection).

In most cases, before the Ministry issuing a permit to import a product, it must be reviewed and recommended for import into Poland by one or more inspections or technical associations, depending on the nature of the product. Some goods also require registration after importation, especially those that may affect the health of consumers.

There are restrictions in Poland that prohibit certain goods, including pirated or counterfeit goods, chemical products, genetically modified organisms (GMOs), as well as live animals and animal products.

Poland has an official “import list” which includes the goods for which licenses are required, their code numbers, any applicable restrictions and the agency that will issue the relevant license. The list also indicates whether a license is required under Polish or EU law.

2. Customs export procedure.

EU goods moved outside the customs territory of the EU must be placed under the export procedure.

This norm does not apply to the following EU goods: goods placed under the processing procedure outside the customs territory; goods moved outside the customs territory of the Union after being placed under the final use procedure; goods exempt from VAT or excise duty, which are supplied as supplies of an aircraft or

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sea vessel, regardless of the destination of the aircraft or sea vessel, and in respect of which confirmation of such supply is required; goods placed under the internal transit procedure; goods temporarily moved outside the customs territory of the EU [301].

The export procedure involves two stages (Fig. 1.11).

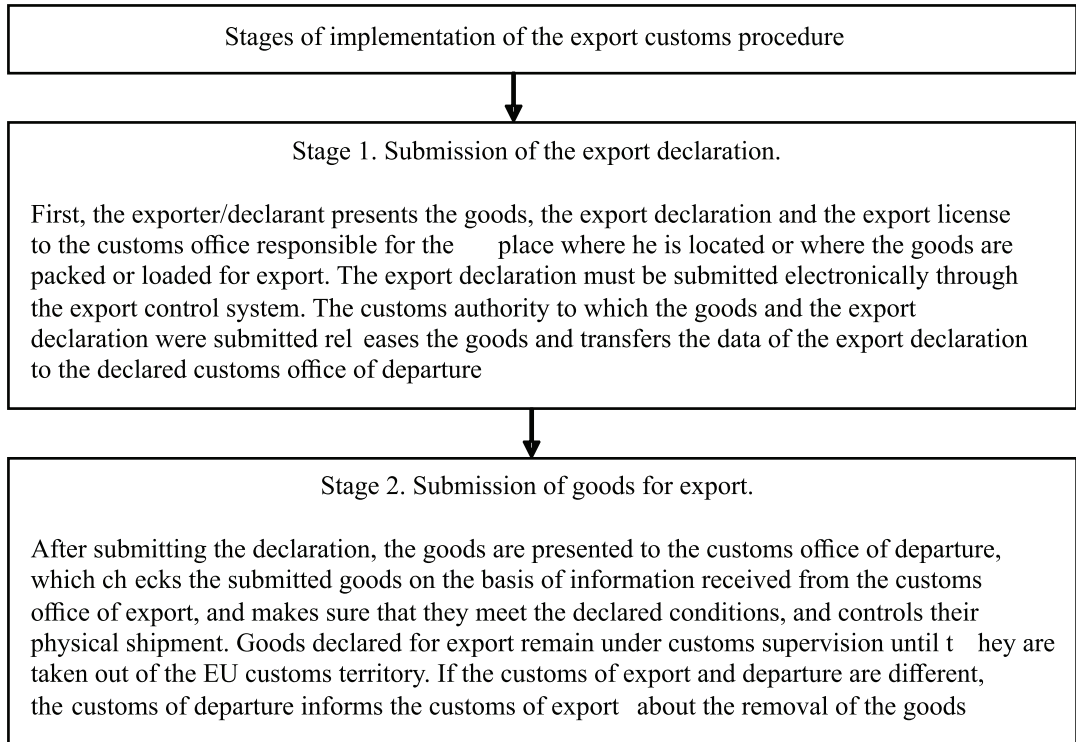


Fig. 1.11. Stages of implementation of the customs export procedure

3. Special procedures.

According to Article 210 of the EU Customs Code, goods may be placed under any of the following categories of special procedures [301]:

- transit, including external and internal transit;
- storage, including customs warehouse and free zones;
- special use, including temporary importation and final use;
- processing, which includes processing in the customs territory and processing outside the customs territory.

As in Ukraine, some special procedures in the EU (except for transit) require permission from the customs authorities.

The main requirements for special customs procedures in EU countries are listed in Table 1.12.

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Table 1.12. Special customs procedures in the EU

Customs procedure	Features
1	2
Transit	<p>As part of the external transit procedure, goods from third countries can move from one point to another within the customs territory of the EU without being subject to any of the following: import duty; other fees provided for by other applicable legislation; trade policy measures, unless they prohibit the arrival of goods into the customs territory of the EU or the departure of goods beyond its borders.</p> <p>Under the internal transit procedure, EU goods can move from one point to another located in the customs territory of the EU and through a country or territory that is not part of that customs territory, without any change in their customs status</p>
Storage	<p>According to the customs warehouse procedure, goods from third countries can be stored in premises or any other place, the permission for the use of which was granted by the customs authorities for such a procedure, and under customs supervision («customs warehouses»). Customs warehouses can be used by any person for the customs storage of goods («public customs warehouse») or by the holder of a customs storage permit for the storage of goods («private customs warehouse»).</p> <p>Taking into account the customs legislation, any industrial, commercial or service activity is allowed in the free zone. Such activities are carried out subject to prior notification to the customs authorities.</p> <p>Currently, there are no free customs zones in: Austria, Belgium, Finland, Ireland, the Netherlands, Slovakia, Sweden</p>
Temporary import and end use	<p>The temporary import procedure can be used only if the following conditions are met:</p> <p>(changes to goods are not expected, except for normal wear and tear due to their use;</p> <p>it is possible to ensure the identification of goods placed under this procedure, except in cases where, in view of the nature of the goods or their intended purpose, the absence of identification measures will not cause any abuse of the procedure, if it is possible to check compliance with the conditions stipulated for equivalent goods;</p> <p>the subject of the procedure is located outside the customs territory of the Union, unless otherwise provided;</p> <p>the requirements of the customs legislation regarding full or partial exemption from the payment of customs duties have been met.</p> <p>According to the end-use procedure, goods may be released for free circulation with duty-free or reduced duty rates</p>

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End of table 1.12

1	2
Processing	<p>The processing procedure in the customs territory can be used in cases other than repair and destruction, only if, without limiting the use of auxiliary means of production, the goods placed under this procedure can be identified in the processed products.</p> <p>According to the procedure of processing outside the customs territory, goods may be temporarily taken outside the customs territory of the Union in order to subject them to processing operations. Processed products obtained from such goods may be released for free circulation with full or partial exemption from payment of import duty upon application by the holder of the authorization or any other person established in the customs territory of the Union, if such person has obtained the consent of the holder of the authorization and the conditions of the authorization done</p> <p>Processing outside the customs territory is not allowed for any of the following goods:</p> <ul style="list-style-type: none"> goods, the export of which leads to the return or exemption from payment of import duty; goods that, before export, were released for free circulation with exemption from payment of duty or at a reduced rate of duty on the basis of their final use, until the goals of such final use have not been achieved, unless such goods must be subjected to repair operations; goods, the export of which leads to the provision of export compensation; goods in respect of which, in accordance with the common agricultural policy, the export of such goods confers a financial advantage other than compensation

As the Table 1.12 shows, norms of the EU Customs Code are correlated with the Customs Code of Ukraine, which indicates the gradual implementation by Ukraine of the norms of the EU customs legislation.

Thus, a study of the rules of application of customs regimes in Ukraine and customs procedures in the EU was conducted.

Significant differences from EU legislation are the absence in the EU Customs Code of such customs regimes as: duty-free trade, destruction or destruction, refusal in favor of the state. Special attention should be paid to the customs regime of duty-free trade. As a result of corruption schemes at customs posts, the volume of smuggling of alcoholic beverages and tobacco products increases annually, which leads to significant losses of the budget of Ukraine.

EU legislation is more stable than Ukrainian customs legislation. Changes to EU legislation are made only in force majeure circumstances (coronavirus pandemic) or due to changes in the economic policy of the EU (military invasion of the Russian Federation in Ukraine).

One of the priority directions of the development of the customs legislation of Ukraine should be the further implementation of the tasks of the Association

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Agreement with the EU in the sector “Customs issues”, which provides for the implementation of the norms of the EU legislation regarding authorized economic operators and the common transit system. The execution of such tasks will be connected, among other things, with customs regimes.

Customs regimes make it possible to build foreign economic relations and determine directions for the development of foreign trade, activate foreign trade and the development of economic entities taking into account their needs and interests through the stimulation of progressive changes on the part of the state and the formation of honest mutually beneficial cooperation between economic entities and the state.

In the process of research, the theoretical aspects of the application of customs regimes in Ukraine are summarized. The approaches of scientists to the classification of customs regimes are determined. It has been proven that the most successful is the classification that divides customs regimes into completed and incomplete. The conditions, requirements and restrictions regarding the application of customs regimes are described. The main functions of customs regimes, which, on the one hand, ensure the filling of the budget, and, on the other hand, regulate the processes of importing goods into the customs territory of Ukraine and exporting them outside the customs territory of Ukraine, are considered. The main regulatory mechanisms of the application of customs regimes in Ukraine are defined. The approach of the EU countries regarding the application of customs procedures, which is analogous to the customs regimes in Ukraine, is summarized. The measures of implementation of foreign experience in the application of customs procedures for their implementation in Ukraine have been determined.

1.4. Transformational aspects of the development of a risk-oriented approach in the financial monitoring system in the context of security policy, European integration and globalization processes of the financial and economic sector

1.4. Transformational aspects of the development of a risk-oriented approach in the financial monitoring system in the context of security policy, European integration and globalization processes of the financial and economic sector

Update on development issues the risk-oriented approach in the financial monitoring system is confirmed by the implementation of updated methodological support for entities of primary financial monitoring in context of AML/CFT issues in accordance with the adopted changes in the regulatory framework.

In particular, in Ukraine, the New Criteria for the legalization (laundering) of proceeds of crime, the financing of terrorism and the financing of the proliferation of weapons of mass destruction have been implemented in Ukraine, approved by the order of the Ministry of Finance of Ukraine dated 28.12.2022 No. 465, registered in the Ministry of Justice of Ukraine dated 09.02.2023 No. 258/39314 and entered into force on February 24, 2023 [242].

According to the approved changes of new criterias [242], Entities of primary financial monitoring independently determine in internal documents on financial monitoring immanent limits for those criteria that contain quantitative and/or evaluative characteristics (“significant increase”, “large volumes”, “high rates”, “regularity”, “many years”, “expensive”, “extraordinarily large assets”, “extraordinarily large operations”) [242].

Entities of primary financial monitoring develops its own risk criteria for legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction, taking into account the risk criteria defined in sections II–IV of the Risk Criteria of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation weapons of mass destruction, typological studies in the field of prevention and countermeasures, prepared by the State Financial Monitoring Service of Ukraine and published by it on its website, the results of the national risk assessment, recommendations of the subjects of state financial monitoring, which carry out state regulation and supervision of the activities of the relevant entities of primary financial monitoring, as well as taking into account the peculiarities activities of entities of primary financial monitoring [242]. During the development of their own criteria for the legalization (laundering) of proceeds of crime, the financing of terrorism and the financing of the proliferation of weapons of mass destruction, entities of primary financial monitoring must also ensure the identification, identification, and assessment of all risks inherent in their activities (entities of primary financial monitoring risk profile) and their clients, and as well as timely development of measures to manage the risks of legalization (laundering) of proceeds obtained

1.4. Transformational aspects of the development of a risk-oriented approach in the financial monitoring system in the context of security policy, European integration and globalization processes of the financial and economic sector

through crime, financing of terrorism and financing of proliferation of weapons of mass destruction, their minimization [242]. During the risk assessment, the entities of primary financial monitoring carries out risk identification, updating and analysis, the result of which is the determination of the level of risk of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction [242].

According to the approved changes, the entities of primary financial monitoring need to be updated the internal documents in the entities of primary financial monitoring on AML/CFT issues no later than three months from the date of entry into force of the new Criteria – until May 24, 2023, since the Criteria are legal act, approved for the implementation of the AML/CFT Law [229].

This indicates the improvement of the existing approaches in terms of the development of a risk-oriented approach in the financial monitoring system.

In particular, in accordance with the Report on the implementation of the Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community and their member states, on the other hand, for the II quarter of 2023, as of June 27, 2023, State Financial Monitoring concluded 23 Memoranda of understanding with financial intelligence units of EU member states. Working negotiations on signing the Memorandum of Understanding with the FIU of the Kingdom of Sweden are also ongoing [302].

A risk-oriented approach in the financial monitoring system in the context of security policy, European integration and globalization processes of the financial and economic sector is a key element of financial risk management, ensuring financial stability and combating crimes such as money laundering, terrorist financing and corruption. Transformational aspects of the development of the risk-oriented approach in the specified area:

Methodological support: Improvement of methodological support of decision-making regarding the risks for the entities of primary financial monitoring.

Technological progress: Thanks to rapid technological development, new innovative tools for analysis and monitoring of financial transactions have appeared. The use of artificial intelligence, machine learning and data analysis allows more effective identification of suspicious transactions and risky customer profiles.

Growing volumes of data: Implementing the risk-based approach requires significant amount of data to analyze and implement adequate measures. With the spread of non-cash payments, electronic financial transactions and other innovations, the volume and complexity of data is increasing, requiring specialized tools for their processing.

International cooperation: the fight against financial crimes requires cooperation between countries.

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Changing regulatory environment: States are implementing stricter regulations on financial monitoring and control. Organizations must adapt to change and improve their monitoring systems to meet new requirements.

Awareness raising and education: An important aspect of risk-based approach is involving staff in understanding and managing risks. Training employees of financial institutions on identifying suspicious transactions and following procedures is necessary component of the successful functioning of the monitoring system.

Application of modern analytical methods: The use of analytical tools makes it possible to more accurately assess risks and predict possible threats to financial stability. Data analysis models help understand complex relationships and identify unusual factors in customer behavior.

Emphasis on preventive measures: Instead of responding to financial crimes, the risk-based approach emphasizes the prevention of such events. By identifying and managing risks in advance, financial institutions can reduce the likelihood of these risks occurring.

Therefore, the risk-oriented approach in the financial monitoring system is constantly updated process that requires the use of new technologies, the involvement of international cooperation and emphasis on preventive measures. Ensuring the safety and stability of the financial sector is a key task for ensuring sustainable economic development in the context of globalization and European integration.

The reform and changes in the paradigm of state regulation and supervision in the system of financial monitoring in Ukraine with the introduction of the risk-oriented approach indicate an increase in the vulnerability of the entities of primary financial monitoring to various risks of legalization of income obtained through criminal means and financing of terrorism [4].

In Ukraine, the national risk assessment in the field of prevention and countermeasures against the legalization (laundering) of criminal proceeds and the financing of terrorism has already been carried out twice in 2016 [303] and in 2019 [304] years (Report on conducting the national risk assessment in the field of prevention and countermeasures against the legalization (laundering) of criminal proceeds and the financing of terrorism, 2016). This is the macro-level, which indicates the development of the national system of financial monitoring, and at the micro-level, each subject of state financial monitoring and primary financial monitoring is guided by the requirements of the current legislation, which determines the benchmark for the introduction of the risk-oriented approach.

The risk assessment of entities of primary financial monitoring includes [242]:

1) assessment of the risk profile of entities of primary financial monitoring: identification and assessment of the risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation of

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weapons of mass destruction, inherent in the activities of the entities of primary financial monitoring; analysis of existing measures to manage the risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation of weapons of mass destruction in order to reduce (minimize) them [242];

2) assessment of the client’s risk profile: identification and risk assessment of business relations with the client; analysis of existing measures to manage the risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation of weapons of mass destruction in order to reduce (minimize) them to an acceptable level of such risks [242].

In the development system of the financial monitoring system, the concepts of “risk-oriented approach”, “risk” and “risks of legalization of criminal proceeds/financing of terrorism” are distinguished, the definitions of which are given in Table 1.13.

Table 1.13. Definition of the concept of “risk-oriented approach”, “risk” and “risks of legalization of criminal proceeds / financing of terrorism”

Definition of the concept	Key aspects	Source
1	2	3
A risk-based approach involves matching the response measures of supervisory authorities with the assessed risks. It enables supervisors to allocate limited resources to effectively reduce the level of established AML/CFT risks in line with national priorities. The formation of supervisory activities directed at AML/CFT risks will reduce the chances of criminals to launder illegal income, and in the case of terrorists, the chances of financing such activities. The risk-based approach, properly implemented, will ensure better responsiveness, reduce burden, and allow more decisions to be made on this issue to the competence of those who are most knowledgeable about making them	Response of supervisory authorities with assessed risks	[120]
The risk-oriented approach involves: identification, evaluation (re-evaluation) and determination of the risks of committing criminal offenses in the economic sphere; taking risk management measures; periodic fixation of the results of the application of the risk-oriented approach; maintaining up-to-date information on risk assessment	Identification, evaluation (re-evaluation) and identification of risks	[288]
A risk-oriented approach is the identification (detection), evaluation (re-evaluation) and understanding of the risks of legalization (laundering) of proceeds of crime, financing terrorism and/or financing the proliferation of weapons of mass destruction, as well as taking appropriate measures to manage risks in the way and to the extent that such risks are minimized depending on their level	Identification (detection), assessment (reassessment) and understanding of risks, taking appropriate risk management measures in the way and to the extent that ensure the minimization of such risks depending on their level	[249]

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End of table 1.13

1	2	3
A risk-oriented approach is the system defined by the bank for managing the risks of legalization of criminal proceeds/ financing of terrorism and taking appropriate measures by it in the way and to the extent that ensure effective minimization of such risks depending on their level	Risk management, its implementation of appropriate measures in the manner and scope that ensure effective minimization of such risks depending on their level	[245]
Risks - the danger (threat, vulnerabilities) for the entities of primary financial monitoring to be used for the purpose of legalization (laundering) of proceeds obtained through crime, financing terrorism and/or financing the proliferation of weapons of mass destruction during the provision of services by them in accordance with the nature of their activities	Danger (threat, vulnerabilities)	[249]
Risks of legalization of criminal proceeds/financing of terrorism – the combination of risks of the bank’s customers and the risk of using the bank’s services for legalization of criminal proceeds/financing of terrorism	A set of risks	[245]

As can be seen from Table 1.13, some key aspects and definitions of concepts can be highlighted:

Risk-based approach: Defined as the risk management system that involves the assessment and response of supervisory authorities to the risks of criminal activities, such as money laundering (ML) and terrorist financing (FT). The risk-oriented approach allows for the effective allocation of resources to reduce the level of risks in accordance with national priorities.

Risk: It is defined as a danger (threat, vulnerabilities) for the entities of primary financial monitoring to be used for the purpose of legalization (laundering) of proceeds obtained through crime, financing terrorism and/or financing the proliferation of weapons of mass destruction during the provision of services by them in accordance with the nature their activities.

Risks of legalization of criminal proceeds/financing of terrorism: This is a set of risks associated with the bank’s clients and the use of the bank’s services for legalization of criminal proceeds and financing of terrorism.

Identification, assessment and management of risks: these are key elements of the risk-oriented approach, which involve the identification of risks, their assessment and the adoption of appropriate measures to manage these risks.

Table 1.13 shows several definitions of the risk-oriented approach and risks, which complement each other, provide general understanding of the concepts and clarify the methods of risk management. These definitions emphasize the importance of the systematic approach to identifying, assessing and mitigating risks in order to ensure financial stability and security. The sources indicated in the table can be

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useful for further detailed study of the topic and increase the amount of information about the risk-oriented approach in the financial monitoring system.

As can be seen from Table 1.13, for the development of the system of state regulation and supervision in the field of financial monitoring, there are indicators that can be used. In particular, these indicators include identification/detection, assessment/reassessment and understanding of risks (list, content). Given the level of these risks, appropriate management measures can be taken to ensure that such risks are effectively mitigated. Also important elements are the understanding of the danger (threats, vulnerabilities) and the presence of a set of risks.

The risk and its definition will serve as the basis for the formation of the risk profile and the determination of adverse factors influencing the occurrence of risks of the entities of primary financial monitoring in the financial monitoring system, subsequently for the development of the risk map [4].

Isolation of the set of risks of primary financial monitoring subjects in the financial monitoring system was carried out by searching the legislative and regulatory framework in the field of financial monitoring, which made it possible to isolate such risks [245]:

Client risk is an existing or potential danger (threat, vulnerabilities) as a result of risk by type of client, risk by type of goods, services that the client receives from the bank, and geographic risk individually or in combination [245]. According to varieties, they distinguish [245]:

- risk by type of client – an existing or potential danger (threat, vulnerabilities) of the client’s financial operations related to the legalization of criminal proceeds/terrorist financing [245];

- risk based on the geographical location of the state of registration of the client or institution (geographical risk) – the risk associated with financial transactions, if the client or the institution through which he transfers (receives) assets has place of residence, place of residence, location, place of registration in the state classified as an offshore zone, or does not fulfill, or improperly fulfills, the recommendations of international, intergovernmental organizations involved in the fight against the legalization of criminal proceeds/terrorist financing, and/or to which applied international sanctions [245];

- service risk – the risk that arises in the event of change in the economic essence of financial transaction (service) due to its possible use for the legalization of criminal income/terrorist financing, in particular, if as a result of certain actions, the directions and/or nature of the use of cash flows change [245].

Compliance risk of financial monitoring is the risk of legal liability or the risk of influence measures being applied by the National Bank of Ukraine, the occurrence of financial losses and reputational losses that the bank may suffer in connection with

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failure to ensure the proper level of compliance with all requirements of the laws of Ukraine, normative legal acts, rules, internal documents of the bank, rules of conduct that may be applied during the performance by the bank of the duties of the entities of primary financial monitoring [245].

Corruption risk is the probability that an event of corruption offense or an offense related to corruption will occur, which will negatively affect the achievement of the specified goals and objectives by the government [243].

Scientists N. M. Vnukova, S. V. Kavun, O. M. Kolodizev, and D. D. Gontar identify the level of connectivity of the entities of primary financial monitoring, which can affect the level of risks of money laundering, terrorist financing and weapons proliferation mass destruction [406]. That is why it is advisable to highlight the risk of connectivity, but not only of the entities of primary financial monitoring, but also of its clients.

In order to form the risk map of the entities of primary financial monitoring in the financial monitoring system, the Anti-corruption program of the State Financial Monitoring Service of Ukraine for 2018–2020 developed by the State Financial Monitoring Service of Ukraine was analyzed, which establishes a set of measures to prevent and counter corruption [13].

This program envisages solving the problems of the probable emergence of corruption risks and the consequences of corruption offenses or offenses related to corruption by: ensuring the effective application of anti-corruption legislation; identification of corruption risks, and elimination of causes and conditions contributing to the commission of corruption offenses or offenses related to corruption; implementation of the system of monitoring and identification of corruption offenses or offenses related to corruption; strict compliance by employees of the State Financial Monitoring Service of Ukraine with the requirements of regulatory and organizational and administrative acts; application of measures to eliminate identified corruption risks; ensuring transparency of activity [13].

The approach proposed by the State Financial Monitoring Service in the Anti-Corruption Program of the State Financial Monitoring Service of Ukraine for 2018-2020 describes in detail the manifestation of corruption risks in the following areas of activity of the State Financial Monitoring Service: collection and processing of information; coordination of the financial monitoring system; organization of legal work; economic activity; HR [13]. Also, it was developed the project of the Anti-Corruption Program of the State Financial Monitoring Service of Ukraine for 2021–2023 [12].

Generalization, based on the source [13], key components of the identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of the corruption

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offense or an offense related to corruption in the field of “Collection and processing of information” are given in Table 1.14. Other areas, according to the source [13], there is “Coordination of the financial monitoring system”, “Organization of legal work”, “Economic activity”, “Personnel management”.

Table 1.14. Identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of corruption offense or an offense related to corruption in the field of “Collection and processing of information”

	1.	2.
Identified corruption risk	The risk of actions or inaction by employees of the State Financial Monitoring Service for the benefit of the entities of primary financial monitoring or third parties during the processing and provision of information on the results of the processing of messages of entities of primary financial monitoring on paper media	The risk of actions or inaction by employees of the State Financial Monitoring Service for the benefit of the entities of primary financial monitoring or third parties in relation to illegal distribution (disclosure), destruction or modification of information that is a secret of financial monitoring, official information and other information with limited access
Probability	Low	Low
Consequences	Low	High
Description of the identified corruption risk	The possibility, during the processing by employees of the State Financial Monitoring Service of EPFM reports submitted on paper media, to enter inaccurate information on them into the unified information system in the field of prevention and counteraction to legalization (laundering) of proceeds from crime, terrorist financing and financing of proliferation of weapons of mass destruction (hereinafter – ISFM) or not to enter information submitted by the EPFM, which will provide benefits to the EPFM or to third parties, and may lead to the commission of a corruption or corruption-related offense	Lack of confirmation in accordance with the legislation of the compliance of the implemented integrated information protection system (ICSI) of ISFM with cryptographic and technical requirements protection of information, does not guarantee the operation of reliable mechanisms for protecting the secrecy of financial monitoring and control over the storage of summarized materials and other results of financial investigations in the ISFM, which may lead to the commission of corruption or corruption-related offense
Corruption risk factors	Unsettled submission of EPFM messages only in electronic form due to the significant cost of specialized software for some EPFM	Lack of reliable mechanisms for protecting the secrecy of financial monitoring due to the lack of state expertise of the KSZI ISFM
Possible consequences of corruption offense or an offense related to corruption	Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service	Illegal disclosure of information with limited access, prosecution of officials, loss of reputation of State Financial Monitoring, legal proceedings processes against the State Financial Monitoring Service

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End of table 1.14

	1.	2.
Measures to eliminate corruption risk	Modernization of the system of submitting information to the State Financial Monitoring Service by submitting it electronically through personal accounts of secure website (developing technical requirements for the creation of secure website for submitting information to the State Financial Monitoring Service in electronic form through personal accounts)	Modernization of the integrated information protection system (CIS), in particular: – experimental operation; – carrying out an examination (KSZI); – introduction of KSZI into industrial operation. Ensuring the functioning of ISFM as well as its comprehensive information protection system (ICSI). Ensuring control of access to information with limited access, its processing and use in accordance with established rules. Control over the preservation of the secrecy of financial monitoring and control over the storage of summarized materials and other results of financial investigations

Source: summarized by source [13]

As can be seen from the Table 1.14, the use of such components as “Identified corruption risk”, “Probability”, “Consequences”, “Description of the identified corruption risk”, “Corruption risk factors”, “Possible consequences of corruption offense or an offense related to corruption”, “Measures on the elimination of corruption risk”, according to the author, it is advisable to use as a basis for developing a risk map of the entities of primary financial monitoring in the financial monitoring system.

These risks of financial monitoring of the entities of primary financial monitoring must be taken into account when forming and functioning of the internal risk management system of the entities of primary financial monitoring.

Entities of primary financial monitoring evaluates its own risk profile taking into account the specifics of its activity and the following criteria [242]:

- 1) the nature and scope of entities of primary financial monitoring activities [242];
- 2) the relevant type(s) of activity of the entities of primary financial monitoring [242];
- 3) types of clients and their risk profile [242];
- 4) the geographical location of the entities of primary financial monitoring, the geographical location of the state of registration of the financial institution in which the entities of primary financial monitoring opens a bank account or through which funds are transferred (received) [242];

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- 5) channels/methods of providing (receiving) entities of primary financial monitoring services [242];
- 6) counterparties, with the participation of which entities of primary financial monitoring carry out their activities and/or carry out actions with assets [242].

Entities of primary financial monitoring, analyzing the risks of legalization (laundering) of proceeds obtained through crime, financing terrorism and financing the proliferation of weapons of mass destruction in their services, should take into account the peculiarities and possibilities of their use [242]:

- 1) intended use of the service: whether entities of primary financial monitoring services make it possible to mask the illegal origin of funds, to be used for the subsequent transfer of funds for the purpose of financing terrorist activities, to promote the anonymity of the participants in a financial transaction (to hide the real end recipients of certain services); whether they can be used by the client on behalf of third parties;
- 2) special possibilities of using the service: does the service enable the entities of primary financial monitoring client to carry out operations involving counterparties, which are characterized by increased risks of legalization (laundering) of proceeds obtained through crime, financing terrorism and financing the proliferation of weapons of mass destruction;
- 3) target segment for the implementation of the service: types of customers who use this or that service the most/most often.

The use of the approach proposed in the Anti-corruption program of the State Financial Monitoring Service of Ukraine for 2018–2020 is taken into account for the formation of the Risk Map of the entities of primary financial monitoring in the financial monitoring system, which is given in Table 1.15.

As can be seen from the Table 1.15, in accordance with the existing approach of the State Financial Monitoring Service in the Anti-Corruption Program of the State Financial Monitoring Service of Ukraine for 2018–2020, the author proposed the use of such components as “Identified risk of the entities of primary financial monitoring in the financial monitoring system”, “Probability”, “Consequences”, “Description of the identified risk of the entities of primary financial monitoring in the financial monitoring system (risk profile)”, “Risk factors of the entities of primary financial monitoring in the financial monitoring system”, “Possible consequences of the risk of the entities of primary financial monitoring in the financial monitoring system”, “Measures to eliminate the risk of the entities of primary financial monitoring in the financial monitoring system” for the development of the risk map of the entities of primary financial monitoring in the financial monitoring system. For the “Probability” and “Consequences” columns, according to the approach of the State Financial

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Monitoring Service, the following options are: “low”, “medium”, “high”. However, the methodology for determining such levels is not prescribed, so the question arises in the development of an approach for determining the levels for the “Probability” and “Consequences” columns.

Table 1.15. Risk map of the entities of primary financial monitoring in the financial monitoring system (to be filled in)

Identified risk of the entities of primary financial monitoring in the financial monitoring system (risk profile)	Probability	Consequences	Description of the identified risk of the entities of primary financial monitoring in the financial monitoring system	Risk factors of the entities of primary financial monitoring in the financial monitoring system	Possible consequences of the entities of primary financial monitoring risk in the financial monitoring system	Measures to eliminate the risk of the entities of primary financial monitoring in the financial monitoring system
Corruption risk						
Compliance risk						
Connectivity risk						
The client’s risk in general and in particular:						
risk by type of client						
risk based on the geographical location of the state of registration of the client or institution (geographical risk)						
service risk						

Source: author’s development presented in the source [4] and developed based on sources [13; 243; 245; 305; 406].

Entities of primary financial monitoring constantly take measures to keep up-to-date (including carrying out a reassessment of the risk level) [242]:

- 1) own risk profile – in the event of a change in the business model, the introduction of new services that are significantly different from the existing ones, given the inherent risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction, and also taking into account the recommendations of the relevant subjects of state financial monitoring, which according to the Law perform the functions

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of state regulation and supervision of such entities of primary financial monitoring;

- 2) the client's risk profile – during the implementation of measures to update the client's data or in case of discovery of new risk criteria inherent in business relations with the client.

Entities of primary financial monitoring on an ongoing basis take measures to identify risk criteria inherent in business relations with the client, analyzing the information obtained as a result of the due diligence of the client and the analysis of the client's financial transactions. Entities of primary financial monitoring are required to document the results of assessment/reassessment of their own risk profile and risk profiles of clients in such a way as to be able to demonstrate their understanding of such risk profiles [242].

Entities of primary financial monitoring determine the list and scope of necessary measures to effectively manage the risks of legalization (laundering) of proceeds of crime, financing of terrorism, and financing of proliferation of weapons of mass destruction [242].

Selection and definition for each identified risk and then, based on these definitions of the aggregate risk, it is suggested to perform the procedure in the decision support system (hereinafter referred to as Decision Making Helper).

This software product will enable [58] to quantitatively evaluate qualitative information regarding the key risks of the entities of primary financial monitoring and apply the opinions of experts according to the characteristics of the levels "Positive", "Quite positive", "Neutral", "Rather", "Unsatisfactory". Before using the Decision Making Helper software product, the list is created adverse factors influencing the risks of the entities of primary financial monitoring in the financial monitoring system, the weight of each of the adverse factors for the proposed risk profile, which are used in the decision-making process, is determined [4]. The interested person (stakeholder) evaluates the influence of the relevant adverse factors for each risk on the state of the corresponding risk [4].

The weight is determined for each of adverse factors of influence on the risks of the entities of primary financial monitoring in the financial monitoring system, based on their level of influence on the corresponding risk. In the Decision Making Helper software product, importance is assessed on the scale from 1 to 5 (from low to high) [58].

The results are presented in the table 1.4 (author's development presented in the source [4] and developed based on sources [13; 243; 245; 305; 308; 406].

As can be seen from Table 1.16, 21 adverse factors (its weight) are proposed for the risk profile consisting of 4 risks and 3 types of risk. It was determined that the feasibility of forming an internal risk management system of the entities of primary

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financial monitoring in the financial monitoring system, which will take into account corruption risk, compliance risk, connectivity risk, client risk in general and by types (risk by type of client, risk based on the geographical location of the state of registration of the client or institution (geographical risk, service risk), taking into account the peculiarities of the manifestation of these risks, in accordance with the specifics of the entities of primary financial monitoring, is determined by the existing approach of the relevant subjects of state financial monitoring in the supervision of accountable entities of primary financial monitoring [4].

Table 1.16. The weight of adverse factors influencing the risks of the entities of primary financial monitoring in the financial monitoring system

Risk profile of the entities of primary financial monitoring in the financial monitoring system	Unfavorable factors influencing the occurrence of risks of the entities of primary financial monitoring in the financial monitoring system	Weight
1	2	3
Corruption risk	1. The existence of facts during the processing of information about clients, their activities by employees (employees) of the entities of primary financial monitoring and the formation of EPFM notifications submitted on paper and electronic media, of entering inaccurate information about clients, their activities to the State Financial Monitoring Service of Ukraine or not entering such information that would provide benefits to clients and/or third parties, which may lead to the commission of a corruption or corruption-related offence	5
	2. The existence of facts of actions or omissions committed by employees (employees) of the entities of primary financial monitoring for the benefit of clients of this entities of primary financial monitoring or third parties during the detection of the performance of duties	4
	3. The existence of facts of non-notification by employees (employees) of the entities of primary financial monitoring about the potential conflict of interests, which may lead to the commission of an offense related to corruption	4
	4. Availability of facts legal liability or the application of measures of influence by the subject of state financial monitoring and/or the occurrence of financial losses and reputational losses suffered by the entities of primary financial monitoring in connection with the failure to ensure the proper level of compliance with all requirements of the laws of Ukraine, regulatory legal acts , rules, internal documents (requirements for development, implementation and constant updating and revision of internal documents regarding financial monitoring) of the entities of primary financial monitoring and/or/or rules of conduct	5

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Continue of table 1.16

1	2	3
Corruption risk	5. Availability of facts violation requirements for development, implementation and constant updating and revision of internal documents regarding financial monitoring	4
	6. Absence of relevant compliance control unit(s) or unsatisfactory state of its/their work	5
Connectivity risk	7. Presence of facts of establishment and/or presence of network schemes, or/ or participation in network schemes, hidden connections, criminal schemes of the entities of primary financial monitoring for money laundering, financing of terrorism and proliferation of weapons of mass destruction	5
	8. The presence of facts of an attempt to establish the business entity of primary financial monitoring or its client(s) with terrorist organizations, other organizations and entities of primary financial monitoring that were involved in the process of money laundering, terrorist financing and the proliferation of weapons of mass destruction	5
	9. The existence of facts of an attempt or establishment of business relations with the natural person who is included in the list of persons connected with the implementation of terrorist activities or in relation to whom international sanctions have been applied	5
The client's risk in general and by types	10. The existence of facts of the existence of network schemes of clients and /or participation of clients of the entities of primary financial monitoring in network schemes, hidden connections, criminal schemes related to money laundering, financing of terrorism and proliferation of weapons of mass destruction	5
	11. The presence of facts of the absence or unsatisfactory state, the permanent basis of the use of the risk control system of the client(s) subject to primary financial monitoring), in particular the financial state of the client(s)	5
	12. The presence of facts of the absence or unsatisfactory state, the permanent basis of the use of the risk control system of the client(s) subject to primary financial monitoring), in particular, the financial transactions of the client(s)	4
Risk by type of client	13. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	14. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	15. The presence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	4
Risk based on the geographical location of the state of registration of the client or institution (geographical risk)	16. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	17. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	18. The presence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	4

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End of table 1.16

1	2	3
Service risk	19. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	20. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	5
	21. The presence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	4

Source: author’s development presented in the source [4] and developed based on sources [13; 243; 245; 305; 308; 406].

The proposed set of criteria will serve as the basis for improving the tools of state regulation and supervision of relevant subjects of state financial monitoring and the tool for self-analysis of those accountable to their entities of primary financial monitoring [4].

In practice, the entities of primary financial monitoring, in particular banks have appropriate rules and procedures for preventing and countering the legalization (laundering) of proceeds of crime, the financing of terrorism, and the proliferation of weapons of mass destruction [4].

In order to reduce risks in the financial monitoring system, the entities of primary financial monitoring should pay special attention to improving internal processes, ensuring proper staff training, using modern technologies, and cooperating with other monitoring entities and control bodies.

For example, the presence of the above-mentioned rules and procedures is fundamental to the client’s own risk management policy at JSC “State Export-Import Bank of Ukraine”, which includes the existence of an organizational structure of financial monitoring, policies and procedures for meeting the requirements of financial monitoring, taking into account the rules of financial monitoring, an identification and verification program and customer study “Know your customer”, financial monitoring compliance management program, training and professional development program for employees regarding the implementation of measures to prevent the legalization of criminal income/financing of terrorism [308].

JSC “State Export-Import Bank of Ukraine” determines the risk of customers at all stages of customer service, taking into account the main components of risk, groups of risk criteria: by type of customer – the total number of criteria, on the basis of which the Bank determines the level of risk according to this indicator, is 18 criteria; according to the risk criterion of services, regarding financial transactions

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that may have the risk of legalization of money laundering, financing of terrorism and proliferation of weapons of mass destruction – the total number of criteria, on the basis of which the Bank determines the level of risk according to this indicator, is 26 criteria; according to the geographical location of the state of registration of the client, it is carried out in relation to the client, whose foreign state of stay (residence) and/or registration, or the institution through which he transfers (receives) assets, is the total number of criteria [308].

Analyzing the channels/methods of providing (receiving) their services, entities of primary financial monitoring should pay particular attention to the risks inherent in the latest technologies (remote establishment of business relations with the client), the presence of agents, and the use of information from other entities of primary financial monitoring [242]. When defining its risk profile, entities of primary financial monitoring must also take into account the presence and nature of impact measures / special economic and other restrictive measures (sanctions) in accordance with the Law of Ukraine “On Sanctions”, which were applied to it [242].

Entities of primary financial monitoring determines the priority/significance of the developed risk criteria, taking into account the possible consequences/impact of such risks, and assigns them an appropriate specific weight for further risk assessment [242]. Entities of primary financial monitoring have the right to assess the risk of business relations simultaneously for a group of clients (one group risk profile), separating such clients into appropriate categories on the basis of clearly defined and recorded in internal documents of entities of primary financial monitoring on financial monitoring parameters (social status, use of the same types of services, of the total volume of financial transactions). If the business relationship with the client corresponds to such parameters, entities of primary financial monitoring assign to such business relationship with the client the level of risk established for such a risk profile. Entities of primary financial monitoring will continue to ensure on a permanent basis the compliance of business relations with the client, separated into a separate risk-profile, with the corresponding parameters of such a risk-profile [242].

Entities of primary financial monitoring, accepting the relevant risks, should take into account the availability of effective measures for their management, in particular, the availability of the necessary resources [242]. Entities of primary financial monitoring takes into account the results of the assessment of its own risk profile when developing risk criteria for assessing the risk of business relations with the client and measures to manage the risks of legalization (laundering) of proceeds obtained through crime, financing terrorism and financing the proliferation of weapons of mass destruction [242]. Entities of primary financial monitoring carry out an assessment of the client’s risk before establishing a business relationship and/or before carrying out a financial transaction (without establishing a business relationship). Based on the results of the

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assessment of business relations with the client, entities of primary financial monitoring establishes the level of risk using a risk assessment model that takes into account the presence of risk criteria inherent to the client. Entities of primary financial monitoring introduce a risk assessment model and determine input data and information sources for risk assessment, a scale for classifying the risk levels of business relations with the client [242]. Entities of primary financial monitoring establish a high risk of business relations in relation to clients defined in the fifth part of Article 7 of the Law of Ukraine “On prevention and counteraction of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction”, as well as in other cases, defined by entities of primary financial monitoring in internal documents on financial monitoring [242]. Entities of primary financial monitoring establish an unacceptably high risk of business relations in relation to clients in the cases defined by part six of Article 7 of the Law of Ukraine “On prevention and countermeasures against legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction”, as well as in other cases, specified by the entities of primary financial monitoring in the internal documents of the entities of primary financial monitoring on financial monitoring [242].

Decision Making Helper is an information system that enables decision-making based on data analysis, models and algorithms. The use of Decision Making Helper has the following advantages:

Increasing the effectiveness of decision-making process: Decision Making Helper helps to collect, analyze large amounts of data.

Improvement of accuracy and reliability: The using of Decision Making Helper allows the use of complex algorithms and models for data processing, which provides more accurate and reliable analysis and forecasting of decision results.

Increasing the speed of decision-making: Decision Making Helper can automate the processes of data analysis, which allows reducing the time needed to solve problems and implement strategies.

Optimization of resources: The use of Decision Making Helper helps to find optimal solutions that maximize the use of resources and improve the efficiency of processes.

Use-friendly interface and data visualization: Decision Making Helper provides the user-friendly interface and data visualization capabilities that allow users to easily understand complex information and make decisions faster.

The online version of Decision Making Helper was used for calculations, i.e. with the maximum number of unfavorable factors – three.

To enter into the Decision Making Helper, the level of risks of the entities of primary financial monitoring is determined by moving the arrow to the required

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rating (from -5 “maximum adverse impact on risk” to +5 “maximum favorable impact on risk”, 0 – neutral impact on risk) [58].

Decision Making Helper automatically provides the characterization of the decision for each risk or its variety, in percentages from -100 % to +100 % and in the words “negative / rather - / neutral / rather +/ positive” [58].

The results of using the Decision Making Helper in order to determine the levels for the “Probability” and “Consequences” columns, based on the application of adverse factors affecting the risks of the entities of primary financial monitoring (an example is the bank) in the financial monitoring system, is shown in Fig. 1.12.

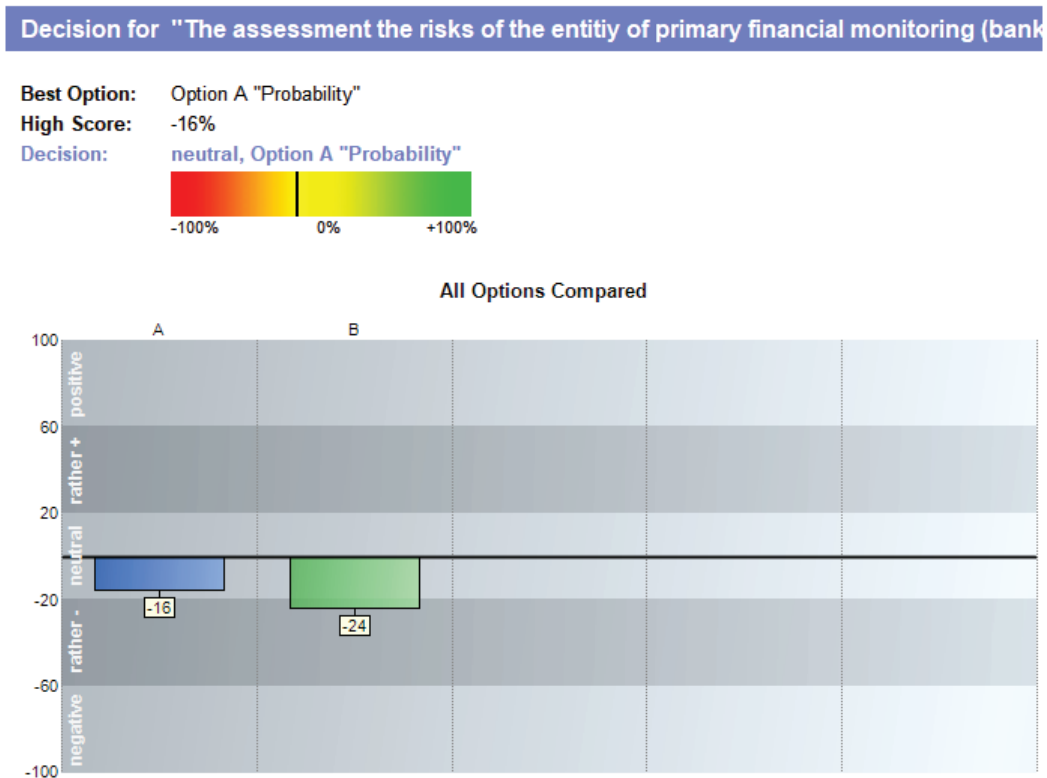


Figure 1.12. The results in Decision Making Helper for the group of adverse impact factors with the weight of “5”

Source: author’s development presented in the source [4].

The characteristics of the results obtained in Decision Making Helper are given in the Table 1.17.

As can be seen from Fig. 1.12 and Table 1.17, an approbation of the approach to determining the levels for the columns “Probability” and “Consequences” according to the risk profile was carried out in the Decision Making Helper Decision Making

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Helper (on the example that the entities of primary financial monitoring is the bank). Therefore, the received assessments of “Likelihood” and “Consequences” for the risk profile of the entities of primary financial monitoring (bank) will serve as the basis for improving the tools of state regulation and supervision of the National Bank of Ukraine and the tool for self-analysis of the entities of primary financial monitoring (bank).

Table 1.17. Example of the assessment of “Likelihood” and “consequences” for the risk profile of the entities of primary financial monitoring (bank)

Risk	Probability	Consequences
Corruption risk		
Level	-16	-24
Characteristic	Neutral	Rather -
Compliance risk		
Level	-12	-68
Characteristic	Neutral	Negative
Connectivity risk		
Level	0	-20
Characteristic	Neutral	Neutral
The client’s risk in general and by types:		
Level	-12	-48
Characteristic	Neutral	Rather –
Risk by type of client		
Level	-16	-48
Characteristic	Neutral	Rather –
Risk based on the geographical location of the state of registration of the client or institution (geographical risk)		
Level	-18	-48
Characteristic	Neutral	Rather –
Service risk		
Level	-12	-48
Characteristic	Neutral	Rather –

Source: author’s development presented in the source [4].

The table 1.17 presents an assessment of various risks for a financial institution, specifically a bank. These risks are evaluated based on two key dimensions: “Probability” (the probability of the risk occurring) and “Consequences” (the potential impact or severity of the risk). Each risk is given a numerical value for both probability and consequences, as well as a qualitative characteristic. **Corruption risk:** Probability: -16 (Neutral), Consequences: -24 (Rather Negative). This suggests that the probability of corruption risk is relatively low (neutral), but if it were to occur, the consequences would be negative. **Compliance risk:** Probability: -12 (Neutral), Consequences: -68 (Negative).

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The probability of compliance risk is assessed as neutral, but the consequences are highly negative. This indicates that compliance issues, if they occur, could have a severe impact on the bank. **Connectivity risk:** Probability: 0 (Neutral), Consequences: -20 (Neutral). This risk is considered neutral in both Probability and consequences, suggesting it's not a significant concern. **Client's risk in general and by types:** Probability: -12 (Neutral), Consequences: -48 (Rather Negative). The probability of risks associated with clients, in general, is neutral, but the consequences are rated as rather negative. This implies that issues related to clients could have a moderate negative impact. **Risk by type of client:** Probability: -16 (Neutral), Consequences: -48 (Rather Negative). Similar to the general client risk, the probability is neutral, and the consequences are rather negative. **Risk based on the geographical location of the state of registration of the client or institution (geographical risk):** Probability: -18 (Neutral), Consequences: -48 (Rather Negative). Geographical risk also has a neutral Probability but rather negative consequences. This suggests that the location of clients or institutions could pose moderate risks. **Service risk:** Probability: -12 (Neutral), Consequences: -48 (Rather Negative). Service risk has a neutral Probability and rather negative consequences. Issues related to services could have a moderate negative impact.

In summary, this assessment highlights the various risks associated with a financial institution, with an emphasis on compliance and client-related risks. The bank appears to have taken a neutral stance regarding the Probability of these risks but recognizes that the consequences could be rather negative if they were to materialize. These assessments are crucial for risk management and decision-making within the bank to ensure the institution's stability and integrity.

Also, it is advisable to take into account for each area, according to the source [13], the manifestation of selected key risks of the entities of primary financial monitoring in the financial monitoring system, which is given in Table 1.18.

Table 1.18. Consideration for each area of activity of the entities of primary financial monitoring of the manifestation of selected key risks in the financial monitoring system

Areas of activity of the entities of primary financial monitoring in the financial monitoring system	Risks of the entities of primary financial monitoring in the financial monitoring system
Collection and processing of information	Corruption risk, compliance risk, connectivity risk, client risk (risk by type of client, risk based on the geographical location of the state of registration of the client or institution (geographical risk, service risk)
Coordination of the subject of primary monitoring in the financial monitoring system	
Organization of legal work	
Economic activity	
HR	

Source: author's development presented in the source [4] and developed based on sources [13; 243; 245; 305; 406].

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The Table 1.18 appears to outline the consideration of key risks within different areas of activity for entities involved in primary financial monitoring within a financial monitoring system.

Collection and processing of information. This area focuses on gathering and handling information related to financial monitoring. The associated risks might include data accuracy, data security, and the ability to collect necessary information effectively.

Coordination of the subject of primary monitoring in the financial monitoring system. This area likely deals with the coordination and oversight of the primary monitoring subjects within the financial monitoring system. Risks could involve coordination challenges, potential conflicts of interest, or regulatory compliance issues related to this coordination role.

Organization of legal work. This area pertains to legal aspects within the financial monitoring system. Risks may encompass legal compliance, regulatory changes, or legal disputes affecting the organization's operations.

Economic activity. Economic activity encompasses the financial aspects of the organization's operations, including revenue generation, expenditures, and financial stability. Risks could relate to economic fluctuations, market conditions, or financial sustainability.

HR (Human Resources). HR deals with the management of personnel within the organization. Risks in this area often include HR compliance, talent acquisition and retention, training, and workforce management.

Each of these areas likely presents its own set of risks and challenges within the context of financial monitoring. The table seems to serve as a framework for considering how key risks manifest within these different areas and may help organizations identify and address vulnerabilities and mitigation strategies. The specifics of these risks and their impact would depend on the nature and scope of the financial monitoring activities and the regulatory environment in which the entities operate.

As can be seen from the Table 1.18, each field of activity of the entities of primary financial monitoring may have its own unique risks that require attention and the implementation of effective measures to reduce their impact and ensure the stability and security of the financial system. Such risks as: corruption risk, compliance risk, connectivity risk, client risk (risk by type of client, risk by geographical location of the state of registration of the client or institution (geographic risk), service risk) occur in each of the subject's spheres of activity primary financial monitoring: collection and processing of information; coordination of the entities of primary financial monitoring in the financial monitoring system, organization of legal work, economic activity, personnel management.

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To test the approach to determining the levels for the columns “Probability” and “Consequences” according to the risk profile, the Decision Making Helper was used and an assessment of the levels was carried out for the bank, which is the entity of primary financial monitoring. The received assessments of “Likelihood” and “Consequences” for the bank’s risk profile will serve as the basis for improving the state regulation and supervision tools of the National Bank of Ukraine, and will also become the tool for self-analysis of the entities of primary financial monitoring (the bank).

Theoretical and methodological provisions and practical recommendations regarding decision-making technology taking into account the key risks of primary financial monitoring subjects (for example, banks) in the financial monitoring system were substantiated.

Based on the analysis of regulatory and legal support and publications, the profile of risks that may be faced by the entities of primary financial monitoring in the financial monitoring system is summarized. This profile includes such types of risks as corruption risk, compliance risk, connectivity risk, overall customer risk, as well as risks related to various aspects of the customer’s activity (for example, risk by type of customer, risk by geographic location of the customer’s country of registration or institutions – geographic risk, service risk).

These studies provide important guidelines and recommendations for effective risk management in the financial monitoring system and will help the entities of primary financial monitoring to avoid the dangers associated with illegal financial activities, legalization of criminal proceeds and terrorist financing.

And therefore, the relevance of the study of the formation of the internal system of risk management of the legalization of income obtained through criminal means and the financing of terrorism of the entities of primary financial monitoring is confirmed. This system means that this entity has established and implemented internal procedures and policies for effective risk management in the financial monitoring system. This system allows you to identify, assess, monitor, control and report on risks that may arise in the course of the financial activity of the subject of primary monitoring.

It is important that the internal risk management system is carefully designed, documented and approved.

It should include specific procedures and techniques that will help ensure effective control and protection against possible risks. In addition, such the system must be constantly updated and adapted to changes in internal and external conditions.

The formed internal risk management system is the necessary component of all entities of primary financial monitoring, to ensure a high level of security and compliance with the requirements of legislation in the field of combating attempts to legalize illegal income and terrorist financing.

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With the introduction of the risk-oriented approach in the financial monitoring system, changes in regulatory support were adopted [249] indicate an increase in the vulnerability of primary financial monitoring subjects to various risks of money laundering and terrorist financing. In addition, it can also increase the possibility of involving them in these processes.

Therefore, it is especially important to effectively manage the risks of legalization of criminal income and financing of terrorism by the entities of primary financial monitoring.

Risk management is the process of influencing the subject, when it is ensured that the risk is reduced to acceptable limits [340].

The risk management system is a set of properly documented and approved risk management policies, techniques and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating all types of risks at all organizational levels [246].

In accordance with the above, the internal risk management system of the entities of primary financial monitoring is a set of properly documented and approved risk management policies, methods and procedures that determine the order of actions aimed at implementing the systematic process of detection, measurement, monitoring, control, reporting and improvement of all types of risks at all organizational levels of the entities of primary financial monitoring [6].

The qualimetric approach involves the quantitative description of the quality of objects or processes (quantitative quality assessment), and the main method of qualimetry is the use of expert assessments [229].

Qualitative models have several advantages in various fields and applications. Some of the key advantages of qualitative models include: Qualitative models can be quickly adapted and modified to reflect changing situations or new information. They allow for easy adjustments to incorporate new factors or variables without requiring extensive recalibration. Qualitative models can capture expert opinions, insights, and experiences effectively. They can incorporate the knowledge and intuition of experienced professionals, which can be valuable when dealing with complex, ambiguous, or uncertain situation. Qualitative models are useful for preliminary analyses and explorations. They can help identify potential relationships, patterns, or trends that may guide further investigations using quantitative models or empirical data. Qualitative models can serve as early warning systems, alerting decision-makers to potential issues or risks before they escalate. By identifying key indicators and qualitative patterns, proactive actions can be taken to prevent or mitigate adverse outcomes. The information system on risk management is a set of technical means, methods and procedures that ensure registration, storage, processing, monitoring and timely formation of reliable information for reporting (informing), analysis and making timely and adequate management decisions on risk management [246].

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Table 1.19. Component of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of proceeds obtained through crime and the financing of terrorism of the entities of primary financial monitoring (corruption risk)

Parameters – R	Weight – M	Risk	Weight – m	Criteria	Weight – V	Indexes		
						Planned	Actual values	Correspondence factor (K)
1	2	3	4	5	6	7	8	9
Preparation for the development of documented and approved risk management policies, methods and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P1=M1 \{ [m1 \Sigma (V1 * K1 - V3 * K3)] \}$	M1 (0.25)	Corruption risk	m1 (0.25)	1. The presence of facts during the processing of information about clients, their activities by the employees (employees) of the entities of primary financial monitoring and the formation by them of reports submitted on paper and electronic media of inaccurate information about clients, their activities to the State Financial Monitoring Service of Ukraine or not entering such information, which will provide benefits to clients and/or third parties, which may lead to the commission of the corruption or corruption-related offense	V1			K1
				2. The existence of facts of actions or omissions by employees (employees) of the entities of primary financial monitoring for the benefit of clients of this entities of primary financial monitoring or third parties during the performance of duties	V2			K2
				3. The existence of facts of non-notification by employees (employees) of the entities of primary financial monitoring about the potential conflict of interests, which may lead to the commission of an offense related to corruption	V3			K3

Source: author's development presented in the source [6] and developed on the basis of sources [5; 13; 243; 245; 246; 281; 305; 308; 406].

Components of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of income received criminal

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means and terrorist financing of the entities of primary financial monitoring (by types of risks) are shown in the Table 1.19–1.22 and Table 1.23, developed on the basis of sources [5; 13; 243; 245; 246; 281; 305; 308; 406].

Therefore, the qualitative model for assessing the quality of the formed internal risk management system of the entities of primary financial monitoring (Table 1.19–1.22, Table 1.23) can become the basis for information and analytical support for the implementation of the risk-oriented approach in the financial monitoring system.

Therefore (Table 1.19–1.22), preparation for the development of documented and approved risk management policies, methods and procedures, which determine the order of actions aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks is determined qualitative model with parameters: $P1 + P2 + P3 + P4$.

Table 1.20. Component of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of income obtained through crime and the financing of terrorism of the entities of primary financial monitoring (compliance risk)

Parameters – R	Weight – M	Risk	Weight – m	Criteria	Weight – V	Indexes		
						Planned	Actual values	Correspondence factor (K)
Preparation for the development of documented and approved risk management policies, methods and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P2=M2 \{[m2\Sigma (V4*K4- V6*K6)]\}$	M2 (0.25)	Compliance risk	m2 (0.25)	4. Availability of facts legal liability or the application of measures of influence by the subject of state financial monitoring and/or the occurrence of financial losses and reputational losses suffered by the entities of primary financial monitoring in connection with the failure to ensure the proper level of compliance with all requirements of the laws of Ukraine, regulatory legal acts, rules, internal documents (requirements for development, implementation and constant updating and revision of internal documents regarding financial monitoring) of the entities of primary financial monitoring and/or rules of conduct	V4			K4
				5. Availability of facts violation requirements for development, implementation and constant updating and revision of internal documents regarding financial monitoring	V5			K5
				6. Absence of relevant compliance control unit(s) or unsatisfactory state of its/their work	V6			K6

Source: author’s development presented in the source [6] and developed on the basis of sources[5; 13; 243; 245; 246; 281; 305; 308; 406].

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As can be seen from the table 1.20, an equal weight for parameters, criteria, etc. is proposed for the qualitative model.

Table 1.21. Component of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of proceeds of crime and the financing of terrorism of the entities of primary financial monitoring (risk of connectivity)

Parameters – R	Weight – M	Risk	Weight – m	Criteria	Weight – V	Indexes		
						Planned (desired reference) values	Actual values	Correspondence factor (K)
1	2	3	4	5	6	7	8	9
Preparation for the development of documented and approved risk management policies, methods and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P3=M3 \{[m3\Sigma (V7*K7- V9*K9)]\}$	M3 (0.25)	Connectivity risk	m3 (0.25)	7. Presence of facts of establishment and/or presence of network schemes, or/or participation in network schemes, hidden connections, criminal schemes of the entities of primary financial monitoring for money laundering, financing of terrorism and proliferation of weapons of mass destruction	V7			K7
				8. The presence of facts of an attempt to establish the business entity of primary financial monitoring or its client(s) with terrorist organizations, other organizations and entities of primary financial monitoring that were involved in the process of money laundering, terrorist financing and the distribution of weapons of mass destruction	V8			K8
				9. The existence of facts of an attempt or establishment of business relations with the person who is included in the list of persons connected with the implementation of terrorist activities or in respect of whom international sanctions have been applied	V9			K9

Source: author's development presented in the source [6] and developed on the basis of sources [5; 13; 243; 245; 246; 281; 305; 308; 406].

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Table 1.22. Component of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of proceeds of crime and the financing of terrorism of the entities of primary financial monitoring (the client’s risk as a whole)

Parameters – R	Weight – M	Risk	Weight – m	Criteria	Weight – V	Indexes		
						Planned	Actual values	Correspondence factor (K)
1	2	3	4	5	6	7	8	9
Preparation for the development of documented and approved risk management policies, methods and procedures, which determine the order of actions aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P4=M4\{[m4\Sigma(V10*-K10- V12*K12)]\}$	M4 (0.25)	The client’s risk in general and by types	m4 (0.25)	10. The existence of facts of the existence of network schemes of clients and / or participation of clients of the entities of primary financial monitoring in network schemes, hidden connections, criminal schemes related to money laundering, terrorist financing and proliferation of weapons of mass destruction	V10			K10
				11. The existence of facts of the absence or unsatisfactory state, the permanent basis of the use of the risk control system of the client(s) subject to primary financial monitoring), in particular the financial state of the client(s)	V11			K11
				12. The existence of facts of the absence or unsatisfactory state, the permanent basis of the use of the risk control system of the client(s) subject to primary financial monitoring), in particular, the financial transactions of the client(s)	V12			K12

Source: author’s development presented in the source [6] and developed on the basis of sources[5; 13; 243; 245; 246; 281; 305; 308; 406].

The decomposition of the client’s risk is represented by the qualitative model with risks: by type of client, by geographical location of the state of registration of the client or institution (geographic) and services.

Qualitative models are useful for communicating complex concepts to non-experts or stakeholders. They facilitate engagement and collaboration among diverse groups, allowing them to contribute to the decision-making process.

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Qualitative models are generally less time-consuming and less costly to develop. They can be particularly advantageous when resources are limited, or when the benefits of detailed quantitative model may not outweigh the associated costs.

Table 1.23. Component of the qualitative model for assessing the quality of the formed internal risk management system for the legalization of proceeds of crime and the financing of terrorism of the entities of primary financial monitoring (client risk: by types)

Parameters – R	Weight – M	Risk	Weight – m	Criteria	Weight – V	Indexes		
						Planned	Actual values	Correspondence factor (K)
1	2	3	4	5	6	7	8	9
Preparation for the development of documented and approved risk management policies, methods and procedures, which determine the order of actions aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P4.1 = M4.1 \{ [m4.1 \Sigma (V13 * K13 - V15 * K15)] \}$	M4.1 (0.33)	Risk by type of client	m4.1 (0.33)	13. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V13			K13
				14. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V14			K14
				15. The presence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	V15			K15
Preparation for the development of documented and approved risk management policies, methods and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks $P4.2 = M4.2 \{ [m4.2 \Sigma (V16 * K61 - V18 * K18)] \}$	M4.2	Risk based on the geographical location of the state of registration of the client or institution (geographical risk)	m4.2 (0.33)	16. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V16			K16
				17. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V17			K17

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End of table 1.23

1	2	3	4	5	6	7	8	9
				18. The existence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	V18			K18
Preparation for the development of documented and approved risk management policies, methods and procedures that determine the course of action aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating risks P4.3=M4.3 {[m4.3Σ(V19* K19 - V21*K21)]}	M4.3 (0.34)	Service risk	m4.3 (0.34)	19. The presence of facts of the absence of relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V19			K19
				20. The presence of facts of the groundlessness of the relevant criteria developed by the entities of primary financial monitoring, on the basis of which he determines the level of risk according to this indicator	V20			K20
				21. The presence of facts of failure to ensure compliance with established restrictions, absence and/or unsatisfactory state of operational response to internal and external factors affecting the level of risk	V21			K21

Source: author's development presented in the source [6] and developed on the basis of sources [5; 13; 243; 245; 246; 281; 305; 308; 406].

Therefore (Table 1.23), preparation for the development of documented and approved risk management policies, methods and procedures that determine the order of actions aimed at implementing the systematic process of identifying, measuring, monitoring, controlling, reporting and mitigating the client's risk by type is determined by qualitative model with parameters: P4.1 + P4.2 + P4.3.

Qualitative interpretation of the obtained grades for the qualitative model for assessing the internal risk management system of the legalization of income obtained through criminal means and the financing of terrorism of the entities of primary financial monitoring can be in the range from 0 to 1 (Table 1.24).

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Table 1.24. Characteristics of the levels of the qualitative model

Rating	Characteristics of the level
1	Distinctive
0.8	Satisfactory
0.6	Acceptable
0.4	Deficient
0	Unacceptable

Source: [396].

As can be seen from the Table 1.24, during evaluation and scoring from 0 to 1, it is possible to obtain five levels of characteristics of the obtained results of the qualitative model assessment of the internal risk management system of the legalization of income obtained through criminal means and the financing of terrorism of the entities of primary financial monitoring.

The use of the proposed qualitative approach (qualimetric model) takes into account the risk profile of the entities of primary financial monitoring in the financial monitoring system, which includes corruption risk, compliance risk, connectivity risk, client risk in general and by types (risk by type of client, risk based on the geographical location of the state of registration of the client or institution (geographical risk), service risk)).

In accordance with the Anti-Corruption Program of the State Financial Monitoring Service of Ukraine for 2018–2020, it is recommended to use such components as “Identified risk of the entities of primary financial monitoring in the financial monitoring system”, “Probability”, “Consequences”, “Description of the identified risk of the subject of primary of financial monitoring in the financial monitoring system (risk profile)”, “Risk factors of the entities of primary financial monitoring in the financial monitoring system”, “Possible consequences of the risk of the entities of primary financial monitoring in the financial monitoring system”, “Measures to eliminate the risk of the subject object of primary financial monitoring in the financial monitoring system” [13].

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Table 1.25. Identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of corruption offense or an offense related to corruption in the field of “Organization of legal work”

Identified corruption risk	Probability	Consequences	Description of the identified corruption risk	Corruption risk factors	Possible consequences of corruption offense or an offense related to corruption	Measures to eliminate corruption risk
6. The risk of not taking into account comments or approval of organizational and administrative acts of the State Financial Monitoring without the approval of the Legal Department	Low	Average	The absence of a clear internal control procedure for taking into account/ not taking into account comments or approval of organizational and administrative acts of the State Financial Monitoring Service without the approval of the Legal Department may lead to the commission of corruption or corruption-related offense	Absence system of effective control over the state of record keeping	Bringing officials to justice, loss of reputation of State Financial Monitoring, legal proceedings against State Financial Monitoring	Making changes and additions to the order of the State Financial Monitoring Service dated 30.07.2012 No. 112 «On the approval of the Instructions on record keeping in the State Financial Monitoring Service of Ukraine»

Source: summarized by source [13].

According to the existing approach of the State Financial Monitoring Service in Anti-corruption program of the State Financial Monitoring Service of Ukraine for 2018–2020 [13] identified risks are summarized (Table A.1 of Appendix A, Table 1.25 – Table 1.27).

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Table 1.26. Identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of corruption offense or an offense related to corruption in the field of “Economic activity”

Identified corruption risk	Probability	Consequences	Description of the identified corruption risk	Corruption risk factors	Possible consequences of corruption offense or an offense related to corruption	Measures to eliminate corruption risk
7. The risk of granting illegal preferences by State Financial Monitoring officials to subjects of economic activity during public procurement, conclusion and execution of economic contracts	Low	Low	The existence of uncertainty in the actions of the members of the tender committee of the State Financial Monitoring Committee regarding the settlement of conflicts of interest during public procurement, conclusion and execution of business contracts may lead to the commission of corruption or corruption-related offense	Irregularity of the conflict of interest settlement procedure	Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service	Making changes and additions to the order of the State Financial Monitoring Service No. 43 dated 01.04.2016 «On the formation of the tender committee of the State Financial Monitoring Service of Ukraine» regarding the prevention of conflicts of interest that may affect the objectivity or impartiality of decision-making

Source: summarized by source [13].

The proposed approach at the level of the State Financial Monitoring Service of Ukraine will contribute to the implementation of the risk-oriented approach and will serve as the policy of standardization of the introduction of this approach into the risk management system of the legalization of income obtained through crime and the financing of terrorism of the entities of primary financial monitoring.

According to the source [5], the ability and effectiveness of risk management depends on the quality of the internal system of managing these risks, which will serve as the basis for internal control and self-analysis. This will contribute to the development of the practice of determining modern approaches to the assessment of processes and quality parameters during risk management. Using the qualitative approach to managing these risks will provide the solution to the scientific problem of assessing the internal risk management system.

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Table 1.27. Identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of corruption offense or an offense related to corruption in the field of “Personnel Management”

Identified corruption risk	Probability	Consequences	Description of the identified corruption risk	Corruption risk factors	Possible consequences of corruption offense or an offense related to corruption	Measures to eliminate corruption risk
8. Risk of non-notification of potential conflict of interest by the candidate for this position to the members of the commission for the selection of candidates for the position	Low	Average	Failure to notify the members of the competitive commission for the selection of candidates for the position by the applicant for this position about potential conflict of interest may lead to the commission of an offense related to corruption	Lack of verification of information about himself and relatives provided by the applicant for the position	Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service	Ensuring familiarization of candidates for the position with the requirement of mandatory notification of close persons working in the State Financial Monitoring Service and responsibility for corruption or corruption-related offenses

Source: summarized by source [13].

This is confirmed by the expediency of implementing the data-centric model for detecting operations related to the legalization (laundering) of proceeds obtained through crime, in accordance with Strategies for the development of the financial sector of Ukraine until 2025 [357].

So, they are justified methodical provisions and practical recommendations regarding the technology (qualimetric approach) of assessing the quality of the formed internal risk management system of the legalization of proceeds of crime and the financing of terrorism of the entities of primary financial monitoring will serve as the basis for its internal control and self-analysis, which will contribute to the development of the practice of determining modern approaches to assessment of processes and quality parameters during risk management in the financial monitoring system.

Requirements for risk management systems can be established at the level of state regulation and supervision or are elements of self-analysis [5]. Entities of primary financial monitoring must evaluate their own internal risk management systems in order to properly perform the functions assigned to them legalization of proceeds of crime and financing of terrorism.

Measures to manage risks of AML include [242]:

- 1) clear division of duties and responsibilities between entities of primary financial monitoring employees and constant internal control [242];

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- 2) preliminary analysis of new entities of primary financial monitoring services in order to identify the inherent risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation of weapons of mass destruction [242];
- 3) application of tools that limit the use of a separate service [242];
- 4) implementation of a diversified approach to obtaining permission to establish (continue) business relations with the client, applying a risk-oriented approach (according to the principle: the higher the risk, the higher the position of the entities of primary financial monitoring employee should be authorized to grant such permission, including entities of primary financial monitoring managers) [242];
- 5) obtaining additional permission from an authorized employee of the entities of primary financial monitoring / manager / executive body (if the executive body is collegial) of the entities of primary financial monitoring to conduct separate financial transactions with a high level of risk within the framework of established business relations [242];
- 6) ensuring monitoring of business relations with the client, which will allow timely (operational) identification of relevant inherent risk criteria [242];
- 7) implementation of client due diligence measures, enhanced due diligence measures and application of the “know your client” principle, including obtaining additional necessary information to understand the content of the client’s activities and/or the essence of the financial transaction [242];
- 8) strengthening measures for monitoring business relations with high-risk clients [242];
- 9) regular and objective informing of the entities of primary financial monitoring management about the identified risks of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of proliferation of weapons of mass destruction and measures to manage such risks [242];
- 10) ensuring proper understanding of entities of primary financial monitoring employees of their responsibilities in the field of prevention and countermeasures, including by conducting training events [242].

Given wide range of risks, the qualitative approach helps to provide more comprehensive and accurate assessment of the risk management system. This allows entities of primary financial monitoring to more effectively identify and respond to potential threats related to the legalization of criminal proceeds and terrorist financing. In addition, this approach helps to improve the overall level of security of the financial system and increase trust in the entities of primary financial monitoring.

1.4. Transformational aspects of the development of a risk-oriented approach in the financial monitoring system in the context of security policy, European integration and globalization processes of the financial and economic sector

Conclusions. According to the existing approach of the State Financial Monitoring Service of Ukraine in the Anti-corruption program for the period 2018–2020, it is proposed to use various components to develop the risk map of the entities of primary financial monitoring in the financial monitoring system. Among these components, the following can be distinguished: “Identified risk of the entities of primary financial monitoring in the financial monitoring system”, “Probability”, “Consequences”, “Description of the identified risk of the entities of primary financial monitoring in the financial monitoring system (risk profile)”, “Risk factors of the entities of primary financial monitoring in the financial monitoring system” and “Possible consequences of the risk of the entities of primary financial monitoring in the financial monitoring system”.

It were grounded the methodological provisions and practical recommendations relating to the technology of assessing the quality of the internal risk management system of the legalization of criminal income and the financing of terrorism in the entities of primary financial monitoring. This technology is based on the qualitative approach, which allows for more accurate and systematic risk assessment.

The qualitative model that was developed takes into account various aspects of risks faced by the entities of primary financial monitoring in the financial monitoring system. These aspects include corruption risk, compliance risk, connectivity risk, as well as risks related to customers in general and risks related to different types of customers (for example, risk depending on the type of customer) and risks related to related to the geographical location of the state of registration of the client or institution (geographical risk), as well as the risk of the service.

PART 2.
FINANCIAL POLICY IN UKRAINE DURING WARTIME
AND SOCIAL INSTITUTIONS: DIRECTIONS OF RELATIONSHIP

2.1. Social responsibility of education in martial law in Ukraine

Education plays a crucial role in shaping society, fostering progress, and empowering individuals. In times of crisis, such as the ongoing military situation in Ukraine, the social responsibility of education becomes even more critical. This monograph aims to explore the topic of “Social Responsibility of Education in the Context of Military Conditions in Ukraine” by examining the key factors, conducting a comprehensive analysis, and highlighting the importance of mentorship and the involvement of stakeholders.

In times of war, the impact on society is far-reaching, affecting various aspects of life, including education. Higher education institutions in Ukraine face immense challenges and responsibilities as they navigate the complex landscape created by the ongoing military conflict. Understanding the role of social responsibility in higher education is essential in addressing the needs of students, faculty, and the broader community during these trying times.

First and foremost, social responsibility in higher education entails a commitment to providing access to quality education for all individuals, regardless of their background or the prevailing circumstances. In the context of war, this commitment becomes even more crucial, as education can serve as a lifeline for individuals seeking stability, personal development, and a sense of normalcy amidst chaos. Higher education institutions have a responsibility to ensure that education remains accessible and that students have the necessary support systems in place to overcome the challenges posed by the conflict.

Additionally, higher education institutions have a unique role to play in fostering social cohesion and reconciliation in times of war. By promoting dialogue, understanding, and tolerance, universities can contribute to building a more inclusive and peaceful society. They can serve as spaces for open discussions, where diverse perspectives are respected and shared. Through academic programs, research initiatives, and community engagement, higher education institutions can actively work towards addressing the divisions and healing the wounds caused by the conflict.

Moreover, social responsibility in higher education encompasses the need to address the immediate and long-term needs of students affected by the war. Many students may have experienced displacement, trauma, or loss, making it essential for universities to provide comprehensive support services, including counseling, rehabilitation programs, and financial assistance. By prioritizing the well-being and holistic development of their students, higher education institutions can contribute to their resilience and empower them to overcome the challenges they face.

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Furthermore, higher education institutions have a responsibility to adapt their curricula and teaching methodologies to address the unique needs and realities of the war-torn environment. By integrating topics related to conflict resolution, human rights, peacebuilding, and post-conflict reconstruction into their programs, universities can equip students with the knowledge and skills necessary to contribute to the recovery and rebuilding of their communities. Additionally, fostering research and academic initiatives that focus on understanding the causes and consequences of the conflict can provide valuable insights for policymakers, aid organizations, and society at large.

Lastly, higher education institutions cannot bear the burden of social responsibility alone. Collaboration and partnership with other stakeholders, including government agencies, civil society organizations, and international bodies, are essential in addressing the multifaceted challenges posed by the war. By working together, these stakeholders can leverage their expertise, resources, and networks to develop comprehensive strategies and initiatives that promote access to education, foster social cohesion, and support the long-term development and stability of the country.

In conclusion, the role of social responsibility in higher education in times of war in Ukraine is of paramount importance. Higher education institutions have a unique responsibility to provide accessible education, foster social cohesion, support students' well-being, adapt their curricula, and collaborate with stakeholders. By fulfilling these responsibilities, universities can contribute to the recovery, resilience, and transformation of individuals and communities affected by the conflict. Through their actions, higher education institutions can become agents of positive change, playing a pivotal role in shaping a brighter future for Ukraine.

The concept of social responsibility in education encompasses the idea that educational institutions have a duty to address the needs and challenges of society, particularly during times of turmoil. In Ukraine, the ongoing military situation has created a unique set of circumstances that require a focused examination of the role education can play in mitigating the impact of the conflict and contributing to social recovery.

This monograph will employ a factor analysis approach to delve into the multifaceted aspects of social responsibility in education. By identifying and assessing various factors that influence education in a conflict-ridden environment, we can gain a deeper understanding of the challenges and opportunities that arise. Through this analysis, we can explore how educational institutions can adapt their practices, curricula, and support systems to meet the needs of students and promote resilience in the face of adversity.

One essential aspect to consider in the context of social responsibility in education is mentorship. The guidance and support provided by mentors can significantly impact the well-being and educational outcomes of students, especially

in challenging circumstances. Examining the role of mentorship within the framework of social responsibility will provide insights into how mentorship programs can be designed and implemented effectively in the Ukrainian context.

Furthermore, it is crucial to recognize the involvement of various stakeholders in fostering social responsibility in education. These stakeholders, including government bodies, educational institutions, civil society organizations, and the broader community, all have a role to play in ensuring access to quality education and promoting social cohesion during times of crisis. Understanding the perspectives and responsibilities of these stakeholders will help identify collaborative strategies and initiatives that can drive positive change in the Ukrainian education system.

In conclusion, this monograph aims to shed light on the social responsibility of education in the challenging context of the ongoing military situation in Ukraine. By conducting a factor analysis, exploring mentorship programs, and involving stakeholders, we seek to provide valuable insights into how education can be a transformative force in rebuilding communities, fostering resilience, and promoting social recovery. Through this exploration, we hope to contribute to the broader discourse on education in conflict-affected regions and inspire evidence-based strategies for addressing the unique challenges faced by the Ukrainian education system.

1. Analysis of recent studies and the unresolved part of the problem

The authors examine the social responsibility of higher education in Ukraine and its role in promoting sustainable societal development. They discuss the experiences and practices of Ukrainian higher education institutions in terms of social responsibility. However, the specific aspects related to the role of social responsibility in the context of war in Ukraine are not extensively addressed in this study. This article focuses on the social responsibility of higher education institutions in Ukraine within the context of sustainable societal development.

Andrushchak, H., & Haidai, N. (2016) provide an overview of the Ukrainian experience, discussing the role of universities in promoting social responsibility and their contributions to sustainable development [11]. However, the specific aspects related to the role of social responsibility in the context of the war in Ukraine are not thoroughly explored. Future research could delve deeper into the challenges and opportunities universities face in fulfilling their social responsibilities during times of conflict.

Golovina, I. (2015) focuses on the social responsibility of universities in the midst of armed conflict. The study explores the practices and challenges faced by universities in fulfilling their social responsibilities during times of war. However, the analysis does not provide an in-depth examination of the specific aspects related to the war in Ukraine. Golovina's study examines the practices and challenges universities

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encounter in fulfilling their social responsibilities during armed conflict. The author explores how universities adapt and respond to the circumstances of war, addressing social issues and supporting communities affected by the conflict. While the article provides insights into the challenges universities face, it may benefit from a more comprehensive analysis of the specific social responsibility initiatives undertaken by universities during the war and their effectiveness [110].

Davydova, G. (2017) explores the international experience and practices related to the social responsibility of higher education institutions, with a focus on the Ukrainian context. The author examines the initiatives and approaches adopted by Ukrainian universities to fulfill their social responsibilities. However, the article does not extensively address the direct implications and responses of universities to the war in Ukraine [57]. Further research could investigate the specific measures and actions taken by universities to address the social impact of the conflict. The author discusses the international experience and practices concerning the social responsibility of higher education institutions. The study aims to identify and analyze the approaches and initiatives adopted by Ukrainian higher education institutions in fulfilling their social responsibilities. However, the direct focus on the role of social responsibility in the context of the war in Ukraine is limited.

Kardash, D., & Samchuk, N. (2018) study investigates the practices and perspectives of universities in fulfilling their social responsibilities during armed conflict. The authors explore the strategies and initiatives implemented by universities to address the challenges posed by the conflict [154]. However, the analysis could be further expanded to include a deeper examination of the long-term effects of universities' social responsibility efforts on the affected communities and the role of universities in post-conflict reconstruction and peacebuilding. Kardash and Samchuk examine the practices and perspectives of universities regarding social responsibility during armed conflict. They investigate the strategies and initiatives implemented by universities to address the challenges posed by the conflict. However, the study does not specifically delve into the unique aspects of the war in Ukraine.

Marchenko, N. (2015) research examines the impact of the armed conflict on the social responsibility of Ukrainian higher education institutions. The study investigates how the conflict has influenced universities' engagement in social responsibility initiatives. However, the article may benefit from a more in-depth exploration of the specific challenges faced by universities during the war and their efforts to address social issues arising from the conflict. Marchenko explores the impact of the armed conflict on the social responsibility of Ukrainian higher education institutions [202]. The study investigates how the conflict has influenced the institutions' engagement in social responsibility initiatives. However, it may not provide an extensive analysis of the specific aspects related to the war in Ukraine.

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Osadchiy, A. (2019) discusses the problems and prospects of social responsibility in higher education in Ukraine. The article highlights the challenges faced by universities and explores potential avenues for promoting social responsibility [264]. While the study acknowledges the difficulties universities encounter, it could provide a more detailed analysis of the strategies and initiatives that universities can employ to fulfill their social responsibilities amidst the ongoing conflict. The author discusses the problems and prospects of social responsibility in higher education in Ukraine. The study analyzes the challenges faced by higher education institutions and explores potential avenues for promoting social responsibility. However, the direct examination of the role of social responsibility in the context of the war in Ukraine may be limited.

Paschenko, Y. (2017) focuses on the role of higher education in promoting social responsibility during the armed conflict in Eastern Ukraine. The author examines how universities contribute to fostering social responsibility and discusses the challenges they face in this context [269]. However, the article could provide more comprehensive examples of specific initiatives undertaken by universities to address the social impact of the conflict. The study examines the initiatives and practices implemented by higher education institutions to address the challenges of the conflict. However, the analysis may not cover all aspects related to the war in Ukraine.

Starkova, O. (2016) explores the social responsibility of Ukrainian universities in the face of contemporary challenges. The author discusses the importance of social responsibility and highlights various initiatives undertaken by universities. Starkova discusses the social responsibility of Ukrainian universities in the face of contemporary challenges [352]. The study explores the initiatives and practices undertaken by universities to fulfill their social responsibilities. However, the direct focus on the role of social responsibility in the context of the war in Ukraine may be limited. However, the article may not extensively delve into the specific challenges and approaches of universities in the context of the war in Ukraine.

Khorolska, T. & Petrenko, A. (2017) examines the social responsibility of Ukrainian higher education institutions and its contribution to societal development. The authors discuss the role of universities in addressing social issues and promoting sustainable development [157]. However, the specific aspects related to the war and the challenges faced by universities in fulfilling their social responsibilities during the conflict could be further explored. The authors analyze the social responsibility of Ukrainian higher education institutions in the context of societal development. They discuss the role of these institutions in facilitating societal progress and examine their initiatives in promoting social responsibility. However, the specific aspects related to the war in Ukraine may not be extensively addressed.

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Shyianov, N. (2018) focuses on the challenges and perspectives of university social responsibility during armed conflict. The study analyzes the difficulties faced by universities and suggests potential strategies and perspectives for addressing them [336]. However, the article may not provide an exhaustive analysis of the specific aspects related to the war in Ukraine. Shyianov focuses on the challenges and perspectives of university social responsibility during armed conflict. The study examines the difficulties faced by universities and identifies potential solutions and future directions. However, the analysis may not provide a comprehensive exploration of the specific aspects related to the war in Ukraine.

Based on our assessment, while these studies offer valuable insights into the broader topic of social responsibility in higher education, they may not extensively cover the specific aspects related to the role of social responsibility in the context of the war in Ukraine. Further research is needed to address these specific aspects and provide a more comprehensive analysis.

2. Justification of the hypothesis with appropriate instruments and methods

2.1. Research objective: The objective of this study is to explore the role of social responsibility in higher education in the context of the war in Ukraine. The research aims to understand how higher education institutions in Ukraine have responded to the challenges posed by the armed conflict and to examine the initiatives they have undertaken to fulfill their social responsibilities during this period.

2.2. Hypothesis: It is hypothesized that higher education institutions in Ukraine have played a crucial role in addressing social issues and promoting social responsibility in the midst of the armed conflict. These institutions have implemented various initiatives to support affected communities, contribute to sustainable development, and foster peacebuilding efforts. The hypothesis suggests that universities have become active agents in mitigating the social impact of the war and promoting societal resilience.

2.3. Methods: To achieve the research objective and test the hypothesis, a mixed-methods approach will be employed. The study will involve both qualitative and quantitative methods to gather comprehensive and diverse data.

Literature Review: An extensive review of relevant literature will be conducted to gain insights into the existing knowledge and theories related to social responsibility in higher education, particularly in conflict-affected contexts. This will provide a theoretical framework for the research and help identify research gaps.

Interviews: Semi-structured interviews will be conducted with key stakeholders, including university administrators, faculty members, students, and representatives from local communities affected by the conflict. The interviews will focus on understanding the social responsibility initiatives undertaken by universities, the challenges they have faced, and the impact of their efforts.

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Surveys: A survey questionnaire will be administered to a representative sample of university students and faculty members. The survey will gather quantitative data on their perceptions of the role of higher education institutions in promoting social responsibility during the war. It will also assess the effectiveness of specific initiatives and their contribution to social development and peacebuilding.

Document Analysis: Official documents, reports, and publications from universities, government agencies, and non-governmental organizations will be analyzed to gather additional information on the social responsibility initiatives implemented by higher education institutions. This analysis will provide a broader perspective on the various programs, partnerships, and policies undertaken during the conflict.

Data Analysis: The collected data, both qualitative and quantitative, will be analyzed using appropriate analytical techniques. Qualitative data from interviews and document analysis will undergo thematic analysis to identify recurring themes and patterns. The quantitative data from surveys will be analyzed using statistical methods to identify trends and correlations.

By employing these research methods, the study aims to provide a comprehensive understanding of the role of social responsibility in higher education in the context of the war in Ukraine. The findings will contribute to the existing knowledge on the subject, highlight effective practices, and identify areas for improvement in promoting social responsibility during times of conflict.

3. The state of higher education in Ukraine

As of January 1, 2022, according to the State Register of Educational Institutions of Ukraine (EDBO), there are approximately 320 autonomous universities, institutes, and academies, as well as 45 autonomous colleges in Ukraine. Among them, 220 higher education institutions (HEIs) are state-owned, 32 are municipal, and 113 are private. These HEIs have 450 branches and vocational colleges within their structure.

The public policy in the field of higher education is formulated and implemented by the Ministry of Education and Science of Ukraine (MES). The MES is responsible for the management of 157 state-owned HEIs, while other state-owned HEIs are subordinate to other ministries and agencies.

At the beginning of 2022, there were 7,984.1 thousand individuals pursuing higher education at the levels of junior bachelor's, bachelor's, and master's degrees. The majority of them (861.7 thousand individuals) were enrolled in state-owned HEIs, while fewer students (96.5 thousand individuals) were studying in private HEIs, and even fewer (19.5 thousand individuals) were enrolled in municipal HEIs. Additionally, 6.4 thousand students were pursuing higher education at these levels in vocational colleges of various ownership forms. Information regarding the number of secondary education graduates in Ukraine is provided in Figure 2.1.

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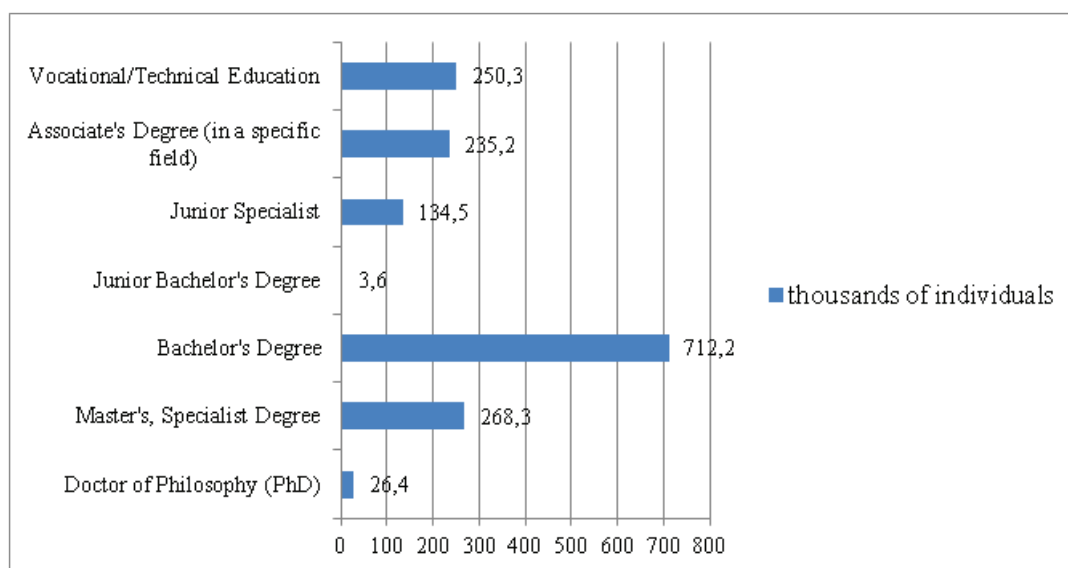


Fig. 2.1. Number of post-secondary education learners in Ukraine, by educational level, thousands of individuals

Source: <https://mon.gov.ua/>.

The state of higher education in Ukraine in the conditions of war has been significantly affected. The ongoing conflict has led to numerous challenges and disruptions that have had a profound impact on the higher education system in the country.

One of the major consequences of the war is the physical destruction and damage to educational institutions. Universities and colleges located in conflict zones or near the front lines have suffered from infrastructure damage, rendering many facilities inoperable. This has resulted in the displacement of students, faculty, and staff, disrupting the normal functioning of educational institutions and hindering the continuity of academic activities (Table 2.1).

Table 2.1. The condition of educational institutions' infrastructure in Ukraine as of February 24th – April 1st, 2022

Educational infrastructure facilities	Damaged	Destroyed
Preschool educational institutions	263	7
Secondary and specialized educational institutions	356	61
Extracurricular educational institutions	17	1
Vocational education institutions	45	5
Higher vocational education institutions	22	1
Higher education institutions	18	1

Source: <https://mon.gov.ua/>.

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Financial constraints have also posed a significant obstacle to higher education in Ukraine during the war. The conflict has strained the country's economy, leading to reduced funding for education. Budget cuts have affected the ability of universities to invest in infrastructure development, research projects, and the provision of quality educational resources. Insufficient financial support has negatively impacted the overall quality of education and the ability to attract and retain highly qualified faculty.

The new Admission Procedure for higher education in Ukraine in 2022 was approved at the end of April. The key innovations of the Procedure included replacing the traditional External Independent Evaluation (EIE) with the National Multidisciplinary Test (NMT) for admission to undergraduate programs, as well as simplifying the Unified Professional Entrance Exam (UPEE) and the Unified Entrance Exam in Foreign Language (UEE) depending on the specialty, and introducing the Master's Test of Academic Competence (MTAC) and the Master's Comprehensive Test (MCT).

The NMT in 2022 consisted of three subjects: Ukrainian language, Ukrainian history, and mathematics. The test was conducted through computer-based online testing. Different participants took the test on different days, but they had to complete the test for all three subjects in a single attempt.

The MCT was used for admission to the Master of Laws program and included a professional exam in law and a foreign language.

The MTAC was required for admission to certain other master's programs and assessed critical, analytical, and logical thinking.

The Procedure expanded opportunities for admission of individuals from conflict-affected areas. These applicants were granted privileges previously established for individuals from temporarily occupied territories of the Autonomous Republic of Crimea and the city of Sevastopol, as well as certain districts of Donetsk and Luhansk regions. Specifically, such individuals were allowed to undergo individual oral interviews at educational institutions instead of taking the NMT.

In the spring of 2022, due to the war, several million Ukrainians left for other countries. To provide school graduates who found themselves abroad with the opportunity to apply to Ukrainian higher education institutions, the testing was organized for the first time in other countries. Temporary examination centers were established in 46 locations across 23 countries (21 EU member states, the United Kingdom, and Moldova) for the main session of the NMT, and in 35 locations across 26 countries (19 EU member states, the United Kingdom, Georgia, Canada, Moldova, the United States, Turkey, Switzerland) for the additional session. In total, 20,204 individuals took the NMT abroad during the main session, and 2,894 individuals during the additional session.

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The war has also contributed to a brain drain in the higher education sector. Talented academics, researchers, and educators have been compelled to leave the country in search of safer environments and better professional opportunities. This exodus of intellectual capital has resulted in a loss of expertise within Ukrainian higher education institutions, impeding their capacity for research, innovation, and academic advancement.

Furthermore, the social and psychological consequences of war have had a profound impact on students and faculty members. The constant threat of violence, the loss of loved ones, and the displacement of communities have led to increased levels of stress, trauma, and psychological distress among the academic community. This has created significant challenges in maintaining a conducive learning environment and addressing the mental well-being of students and educators.

Despite these challenges, efforts have been made to mitigate the effects of the war on higher education in Ukraine. Initiatives have been implemented to support universities in conflict-affected areas, including the provision of temporary facilities, financial assistance for students, and counseling services. Collaboration with international partners and organizations has also played a crucial role in rebuilding educational infrastructure and facilitating academic exchange programs (Table 2.2).

Table 2.2. Examples of academic exchange programs that are currently active in Ukraine

Program name	Essence of the program
1	2
Erasmus+	European Union program that supports international mobility and cooperation in the field of education, training, youth, and sport. It offers opportunities for students, teachers, and staff to study, train, or work abroad in participating countries. The program aims to enhance skills, promote cultural understanding, and foster collaboration between institutions. Ukraine is also a participant in the Erasmus+ program, which provides opportunities for students, teachers, and staff to study, train, or work abroad in European Union countries. Through Erasmus+, Ukrainian students and academic staff can engage in educational exchange and cooperation with European partners
Fulbright Program	The Fulbright Program is a prestigious international educational exchange program funded by the U.S. government. It provides scholarships for students, scholars, teachers, and professionals to undertake academic activities in the United States and other countries. The program aims to promote mutual understanding and cultural exchange between nations
Chevening Scholarships	Chevening Scholarships are awarded by the UK government to outstanding individuals from around the world. They enable recipients to study postgraduate courses at universities in the United Kingdom. The program aims to develop global leaders and promote international cooperation
DAAD Scholarships	The DAAD (Deutscher Akademischer Austauschdienst) Scholarship program is offered by the German government to support international students and researchers. It provides funding for studying, researching, or working at German universities. The program promotes academic exchange and cooperation between Germany and other countries

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End of table 2.2

1	2
Australia Awards	Australia Awards are scholarships and fellowships funded by the Australian government. They aim to contribute to the development of partner countries by providing opportunities for individuals to study, conduct research, or undertake professional development in Australia. The program focuses on building knowledge, leadership, and links between institutions
Global UGRAD Program	The Global Undergraduate Exchange Program (Global UGRAD) is sponsored by the U.S. Department of State. It provides opportunities for undergraduate students from Ukraine to study at U.S. colleges and universities for one academic semester. The program aims to promote mutual understanding between the people of the United States and Ukraine through educational and cultural exchange
Mevlana Exchange Program	The Mevlana Exchange Program is administered by the Council of Higher Education in Turkey. It enables students and academic staff from Ukrainian universities to participate in exchange programs with Turkish universities. The program aims to foster academic collaboration and cultural exchange between Ukraine and Turkey
Bilateral Exchange Programs	Some universities in Ukraine have established bilateral exchange programs with partner institutions in other countries. These programs allow students and faculty members to participate in academic exchanges, collaborative research projects, and cultural immersion activities

Source: Erasmus+ Program: Erasmus+ - https://ec.europa.eu/programmes/erasmus-plus/node_en

Fulbright Program - <https://foreign.fulbrightonline.org/>

Chevening Scholarships - <https://www.chevening.org/>

DAAD Scholarships - <https://www.daad.de/en/>

Australia Awards - <https://www.australiaawards.gov.au/>

Global UGRAD Program - <https://exchanges.state.gov/non-us/program/global-undergraduate-exchange-program-global-ugrad>

Mevlana Exchange Program - <http://www.yok.gov.tr/en/web/mevlana>.

These (Table 2.2) are just a few examples of active academic exchange programs. It's important to note that specific eligibility criteria, application procedures, and available opportunities may vary for each program. Prospective participants are encouraged to visit the respective program websites for detailed information and to check for any updates or changes in program offerings. It is important to note that the availability and specific details of these programs may vary depending on the ongoing war situation and other factors. Interested individuals should consult with their respective universities, education institutions, or relevant government authorities to obtain the most up-to-date information about active academic exchange programs in Ukraine.

Despite these challenges, there have been notable efforts to address the issues and revitalize higher education in Ukraine. Various initiatives have been implemented to support universities in conflict-affected areas, including the provision of temporary

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facilities, financial aid for students, and counseling services. Collaboration with international partners and organizations has also played a crucial role in rebuilding educational infrastructure and facilitating academic exchange programs.

In the context of the ongoing war in Ukraine, the state of higher education has been significantly impacted. The conflict has brought about a range of challenges and obstacles that have directly affected the functioning and development of higher education institutions in the country.

One of the key issues faced by Ukrainian higher education is the disruption of academic activities and institutional infrastructure. The conflict zones and areas near the front lines have experienced severe damage to educational facilities, including universities and colleges. This has resulted in the displacement of students, faculty, and staff, and has significantly hampered the normal operation of these institutions. Disrupted academic schedules, canceled classes, and limited access to educational resources have become common occurrences, leading to a deterioration in the quality and continuity of education.

4. Decrease in the level of democratization in governance at certain universities

In order to promote the democratization of governance in Ukrainian universities, legislative provisions have been established since 2014, stating that the head of the higher education institution is elected by the collective through secret voting for a term of five years and that the same person ‘cannot hold the position of head of the respective higher education institution for more than two terms.’ The need for implementing these norms was driven by the practice of having the same person lead certain large Ukrainian universities for two or more decades. This practice is part of a ‘closed’ governance system in higher education, informally referred to as ‘rectorial feudalism’ in Ukraine. This practice fosters conservatism within the institutions, limits the influence of constructive criticism on internal processes, hinders career advancement for other staff based on professional achievements (as it is difficult to aspire to higher administrative positions if there is minimal rotation of individuals holding these positions), and increases corruption risks.

However, certain decisions by government authorities during the period of martial law allow for the circumvention of these norms. One way to bypass the restriction on holding the position of the head of the respective institution for more than two terms is to reorganize the higher education institution, resulting in the formation of a ‘new’ university with a slightly modified name, which, according to formal criteria, is considered a different legal entity. The leader of the ‘previous’ university then gains the opportunity to head the ‘new’ university for another two five-year terms.

In 2022, three such changes of legal entities took place. Kyiv National University of Trade and Economics (KNUTE) was reorganized to establish the State University of Trade and Economics and the Odessa Trade and Economic Vocational

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College. The person who had been leading KNUTE since 1991 won the elections for the position of rector of the newly formed university in 2022, and in May 2022, they were appointed for a new five-year term.

M. P. Dragomanov National Pedagogical University was reorganized to establish the Ukrainian State University named after M. Dragomanov. The acting rector of the ‘new’ university is the person who had been leading the ‘previous’ institution since 2003, although the corresponding order of the Ministry of Education and Science has not been officially posted on their websites.

Zaporizhzhia State Medical University and the State Institution ‘Zaporizhzhia Medical Academy of Postgraduate Education of the Ministry of Health of Ukraine’ were reorganized to establish Zaporizhzhia State Medical and Pharmaceutical University. The acting rector of the ‘new’ university is the person who had been leading the first of the ‘previous’ higher education institutions since 2003.

In turn, the Law of Ukraine ‘On Higher Education’ requires university founders to announce a new competition for the position of university head ‘no later than two months before the expiration of the contract term of the person holding that position’ and to conduct such a competition within approximately three months.

However, discretionary decisions by the Ministry of Education and Science effectively allow for the ‘extension’ of the current term of office for university leaders. For example, between February 24 and December 1, 2022, decisions were made by the Ministry of Education and Science regarding the elections of leaders in 23 higher education institutions. Among them, in five institutions, the elections were scheduled within the timeframe established by law. In 16 institutions, according to the Ministry’s decision, the elections are expected to take place within three months after the completion of the previous leader’s term.

5. Financial situation of higher education in Ukraine in times of war

Financing of higher education in Ukraine is practically carried out in one of two (theoretically three) ways.

Students can study at the expense of the state or local budgets, in which case they do not pay for their education. The formal term for this funding method is “education under the state (regional) order”, colloquially referred to as studying “on budget”. Some students may also receive a small scholarship.

In the alternative scenario, students independently pay the educational institution for the cost of their studies. The formal term for this funding method is “education at the expense of individuals and legal entities”, colloquially referred to as studying “on a contract basis”.

Theoretically, it is possible to study “on a contract basis” using a targeted preferential government loan. However, the number of recipients of such loans does not exceed 100 individuals per year.

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There are no options for co-financing education (where its cost is partially covered by state or local budget funds and partially by the student) in Ukraine.

The financial situation of higher education in Ukraine in times of war is a highly relevant topic due to the significant impact that armed conflict can have on the country's economy and public finances. During times of war, governments often face challenges in allocating sufficient funds to various sectors, including education. The financial resources available for higher education institutions may be affected, leading to potential budget cuts, changes in funding priorities, and the need to seek alternative sources of funding. Understanding the financial state of higher education in Ukraine in the context of war is crucial for policymakers, education administrators, and stakeholders to assess the sector's sustainability, make informed decisions regarding resource allocation, and ensure the continuity of quality education in challenging circumstances.

Financial constraints have also posed a significant challenge to higher education in Ukraine. The war has strained the country's economy, resulting in reduced funding for education. Budget cuts have affected the ability of universities to maintain and upgrade their infrastructure, support research initiatives, and provide adequate resources for teaching and learning. This financial instability has had a direct impact on the overall quality of education and the ability of institutions to attract and retain highly qualified faculty members.

The Ukrainian government's draft state budget for the year 2023, taking into account the conditions of martial law and a severe shortage of state financial resources, due to the large-scale armed aggression by the Russian Federation, the forecast that was considered during the formation of the 2022 budget has become irrelevant. The war has also changed the traditional forms and approaches to analyzing and forecasting the country's economic and social development. In terms of higher education funding in 2023, the budget proposes a reduction in funding compared to the previous year. The budget for the program "Preparation of personnel by higher education institutions for the Ministry of Education and Science" is suggested to be reduced by over 4 billion hryvnias (from 21.07 billion hryvnias to 17.06 billion hryvnias). Similarly, funding for the Taras Shevchenko National University of Kyiv, under the budget program 2201280, is proposed to be reduced by over 400 million hryvnias (from 1,729,253 thousand hryvnias to 1,312,618 thousand hryvnias). Additionally, funding for the Fund for the Development of Vocational and Higher Education Institutions is not planned for 2023, while 250 million hryvnias were allocated for this program in the previous year. On the other hand, the Ministry of Internal Affairs (MIA) will receive increased funding for the program "Preparation of personnel by higher education institutions with specific training conditions." The funding for this program will increase by over 500 million hryvnias (from 1,949,875

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thousand hryvnias to 2,470,316 thousand hryvnias) from the general fund and by 40 million hryvnias (from 426.6 million hryvnias to 466.9 million hryvnias) from the special fund. It is worth noting that in 2022, the government reallocated funds from the reserve fund twice to finance the needs of the Ministry of Internal Affairs under the same program. The funding adjustments were made to provide additional remuneration to military personnel, police officers, and ensure proper payment for the personnel of the Ministry of Internal Affairs. In summary, it is evident that the funding for the Ministry of Education and Science will be reduced in 2023. However, funding for higher education continues through international funds. The budget for the program “Higher Education, Energy Efficiency, and Sustainable Development” will increase by over 1.8 billion hryvnias (from 649,800 thousand hryvnias to 2,520...). The main goal of this program is to bring the infrastructure of higher education institutions up to modern energy efficiency standards.

However, this policy is inconsistent as it did not affect some other state higher education institutions. In 2022, expenditures from the state budget for budget program 1001080 “Training of personnel by higher education institutions with specific learning conditions”, which funds higher education institutions in the management sphere of the Ministry of Internal Affairs of Ukraine, were not reduced. Budget expenditures for this program are planned to increase in 2023 (Figure 2.2).

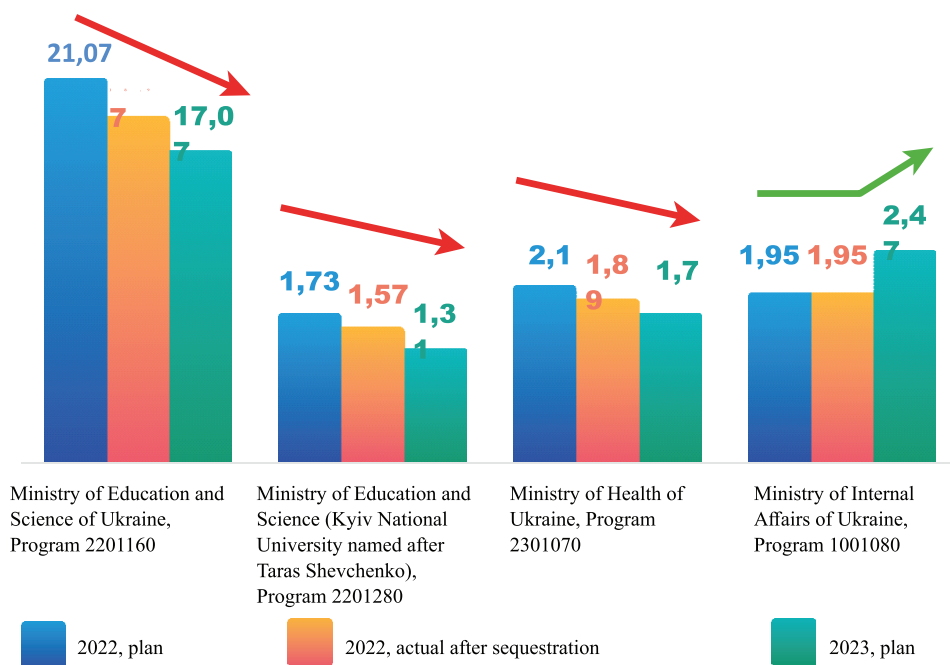


Fig. 2.2. Funding of higher education institutions from the general fund of the State Budget through various ministries in 2022 and 2023, billion UAH

Source: <http://www.ukrstat.gov.ua>; <https://mon.gov.ua/>

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In the 2022 state budget, an allocation of 153.7 billion hryvnias was earmarked for education, while in the 2023 budget, it was reduced to 142.8 billion hryvnias. This represents a decrease of 10.9 billion hryvnias compared to the previous year.

The initial figure mentioned in the 2023 budget proposal was 155 billion hryvnias, but the final amount turned out to be lower. In comparison between the budgets for 2022 and 2023, there is an evident reduction in educational subsidies (97.2 billion to 87.5 billion hryvnias) and subsidies for support of individuals with special educational needs (0.45 billion to 0.30 billion hryvnias). On the other hand, two new subsidies have been introduced: 1.5 billion hryvnias for improving safety conditions in schools, 1 billion hryvnias for the purchase of school buses.

State expenditures have also experienced cuts, including: Reduction of funds for the preparation of personnel by higher and vocational education institutions (minus 2.5 billion hryvnias). Reduction of funds for academic scholarships (minus 0.4 billion hryvnias). However, there has been an increase in funding for the National Fund for Development, grant support for scientific research, and scientific-technical (experimental) research. The allocation for these purposes is 2 billion hryvnias for 2023, compared to 1.5 billion hryvnias in 2022.

Funding for the higher education sector from the state budget was sequestered after the start of full-scale armed aggression. The funding volume for specific budget programs, primarily managed by the Ministry of Education and Science, was reduced by 10 %. In particular, under budget program 2201160 “Training of personnel by higher education institutions and provision of their practical training bases”, the funding volume was reduced by 2.107 billion UAH. Similarly, funding for higher education institutions in the management sphere of the Ministry of Health of Ukraine was also reduced.

Additionally, the war has caused a brain drain in the higher education sector. Many talented scholars, researchers, and educators have been forced to leave the country in search of safer environments and better career opportunities. This loss of intellectual capital has had a detrimental effect on the knowledge and expertise available within Ukrainian higher education institutions, impeding their ability to contribute to research, innovation, and academic development.

Furthermore, the war has created a challenging social and psychological environment for students and faculty members. The constant threat of violence, the loss of loved ones, and the displacement of communities have resulted in increased stress, trauma, and psychological distress among the academic community. This has impacted the overall well-being and mental health of students and educators, making it difficult to maintain a conducive learning environment.

The indicative cost is the amount calculated annually by the authorized government body for each public higher education institution. State institutions are

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not allowed to set tuition fees for their prospective students under a “contract” at a level lower than this amount. This policy is implemented to restrict the undercutting practices of higher education institutions and combat the provision of educational services to contract students at significantly lower prices, which are substantially less than the amount that the same institution receives from the State budget for educating one budget-funded student in the same field. However, due to the cancellation of this regulation in 2022, higher education institutions had the opportunity to independently determine the tuition fees for contract students for the current year.

Formula-based funding was introduced in 2019, which involves determining the funding amount for each higher education institution based on specific criteria, including the number of students, regional support, indicators of scientific activity, international recognition, and graduate employment.

Experts argue that the suspension of formula-based funding in 2022 was most likely due to the overall funding shortage in the sector, as well as the influence of Ukrainian university rectors in making this decision. The Formula is applied to distribute a small portion of the overall funding from the state budget among universities. The principle of formula-based funding is that each institution is guaranteed to receive, for example, 95 % (or another percentage determined by the Ministry of Education and Science) of the funding from the previous year. The remaining 5 % is “collected” from all institutions and redistributed so that institutions demonstrating better performance, for instance, receive an additional 15 % of the previous year’s funding, making it a total of 110 % in addition to the guaranteed 95 %. Meanwhile, institutions with poorer performance only receive 95 % of the previous year’s budget. After the State budget sequestration, this “surplus” disappeared, which could have been reallocated among the institutions, thus halting the formula’s operation. In 2022 and at least in 2023, the state funds the activities of higher education institutions proportionally to the number of students enrolled in these institutions.

Another challenge for Ukrainian higher education institutions was that due to the war, a significant number of students studying on a contract basis lost the ability to pay for their education. In the spring of 2022, the most common decisions made by university administrations regarding such students were deferring tuition payments and forcing them to take academic leave (a break in studies). Later, in October 2022, the government made a decision that students studying on funds provided by individuals or legal entities and residing in war-affected regions could be transferred to studying on the state budget. By the end of 2022, approximately 13,000 students were transferred to budget-funded education based on this decision.

In conclusion, it can be confidently stated that in challenging conditions, Ukrainian policy makers in higher education have largely coped with the challenges

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of the state of war. The decisions made after February 24 were optimal for the higher education system and aimed to preserve the system from significant losses as much as possible. Undoubtedly, some decisions could have been better, but considering the available resources, capacities, and time constraints, these decisions are now perceived as the most balanced and necessary. Thanks to the coordinated and motivated work of Ukrainian universities and educators, the destructive impact of the brutal Russian invasion on higher education has been mitigated.

6. Loss of human capital due to russian aggression in 2022

On February 24, 2022, Russia carried out a full-scale invasion of Ukraine, resulting in significant loss of human capital. These losses can be divided into two groups: direct and indirect. Direct losses include forced migration, forced deportation of the Ukrainian population to Russia, killing of civilians, and military casualties.

According to the International Organization for Migration (IMO) report dated May 3, 2022, the total number of displaced persons was 13.7 million, with 5.7 million leaving Ukraine. Meanwhile, among the non-displaced individuals, only 4 % consider the possibility of leaving, and another 7 % will decide based on the situation [57].

It is reasonable to assume that some of those who left Ukraine will not return. This will depend on the duration of the war, the scale of destruction in Ukraine, as well as the opportunities for Ukrainians to find decent employment abroad and for Ukrainian students to access the education system. According to a UN survey conducted on March 19, 2022, about 30 % of individuals crossing the border with Poland expressed the need for employment support [154]. This indicates the readiness of this portion of forced migrants to engage in work.

It is worth noting that the majority of those who left Ukraine were women and children due to restrictions imposed on men aged 18–60. According to estimates by the Minister of Education and Science, out of the total number of forced migrants who left the country (2.5 million), school-age children and students accounted for 2.5 million, and 22,000 were teachers [75]. To understand the scale of the outflow of student and school-age youth, it should be mentioned that the number of students in general education schools in Ukraine in the 2020–2021 academic year was 4.2 million, university students – 1.1 million, post-secondary vocational education students – 0.17 million, and students of vocational-technical institutions – 0.25 million [188; 204; 309]. These data suggest a potential loss of around 40 % of student and school-age youth, who represent the country's labor potential.

The situation with forced Ukrainian migrant children and students can be viewed from two perspectives. On the one hand, education of Ukrainian youth abroad will contribute to the formation of a new highly educated, multicultural segment of the youth. This will be facilitated by Ukrainian youth's access to free

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education in European educational institutions and support programs for forcibly displaced families from Ukraine. It should be noted that temporary shelter programs for Ukrainian families abroad are currently in effect for a period of 1 to 3 years.

On the other hand, a certain portion of highly educated youth may not return to their homeland. It can be assumed that this applies more to student and high school-age youth. Since this segment of youth is less dependent on their parents due to age and, given their continuation of education in European universities and vocational-technical education institutions, they will undergo adaptation and assimilation in the countries of temporary residence. The youth's choice to return to their homeland will be influenced by two main factors: the duration of the war in Ukraine and the openness of the European job market for decent employment.

Another component of the loss of human capital is the forced "evacuation" of Ukrainian citizens to Russia. According to data released by Lyudmila Denisova, the Commissioner for Human Rights of the Verkhovna Rada, in her Telegram channel from Ukraine, a significant number of people were evacuated to Russia.

The full utilization of the intellectual and creative potential of the country's human capital is impossible in times of war. This is due to the loss of employment or other income-generating activities by Ukrainians as a result of the destruction of enterprises and organizations. A certain portion of businesses find themselves in a situation of partial or complete loss of demand for their goods and services due to shifting values. In addition, there are difficulties in finding decent employment faced by internally displaced persons and those who have migrated abroad. In the territories of Ukraine where active military operations are not taking place, this is associated with low business activity, which is caused by the need for time, financial, and human resources (specialists) to relocate and adjust production capacities, as well as the decrease in people's purchasing power. Abroad, the main barrier is the language barrier, which is intensified by high competition in the labor market and the local legislation of the host country (qualification confirmation or licensing for performing skilled work that refugees were engaged in in their home country).

First and foremost, the unfavorable background for the development of the creativity of human capital and its self-realization is the state of the majority of Ukrainians, which can be characterized as stressful. According to a survey conducted by CG "Rating" (8 surveys, 6.04.2022), 50 % of respondents define their state as tense or very tense, and 71 % indicate that they have an average level of emotional exhaustion. These conditions do not contribute to active and creative engagement.

The educational component of human capital formation is a crucial investment in human capital, shaping and developing the country's human potential, and ensuring innovative economic development. In the conditions of digital transformation of the economy, human capital becomes its driver. This requires systematic and significant

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educational investments through the formation of a flexible, technologically well-equipped education system that meets the demands of businesses.

As a result of the full-scale war, the destruction of educational infrastructure occurs daily. As of May 27, 2022, at least 621 kindergartens and 1,123 institutions of secondary and higher education have been destroyed or damaged. The financial losses from the named objects alone amount to \$2,078 million USD. Ukraine's losses from the destruction of physical infrastructure (residential buildings, utilities, roads, railways; educational and medical institutions, etc.) by the aggressor country amount to over \$105.5 billion USD [156].

A challenging task for the national education system is the educational process in newly occupied territories, which takes place in three scenarios: cessation of the educational process, continuation of the educational process according to Ukrainian standards, and implementation of the educational process according to the standards of the occupant. Cases of resuming the educational process with changes in standards, requirements, and programs have been recorded in Enerhodar, Melitopol, Volnovakha, Mariupol, and Stavropol.

On the territories under Ukraine's control, the negative consequence has been the cessation of the educational process for a period of 2 to 4 weeks since the start of the military aggression. Currently, the educational process in the majority of educational institutions has been restored in a distance learning format using information technologies. In regions where active combat is taking place, no teaching is conducted at all, and in relatively calm regions, the educational process is accompanied by numerous interruptions due to air alarms. This means that a certain part of the material is transferred to self-study without classroom instruction, which negatively impacts the quality of education.

7. Achievements and restoration of human capital in the post-war period

The post-war period has seen significant achievements and restoration of human capital. Despite the devastating impact of the war, efforts have been made to rebuild and improve various aspects of human capital. Let's explore the key accomplishments.

Firstly, there has been a remarkable recovery in education and skills development. Numerous initiatives and programs have been implemented to rebuild educational institutions, provide access to quality education, and enhance vocational training opportunities. This focus on education has contributed to the reintegration of individuals into the workforce and the development of a skilled labor force.

Secondly, there has been a resurgence of entrepreneurial spirit and innovation. Despite the challenges faced during the war, many individuals have displayed resilience and creativity in rebuilding their lives and businesses. Start-up ecosystems

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have emerged, fostering innovation, technology adoption, and economic growth. This entrepreneurial drive has played a vital role in revitalizing industries and creating employment opportunities.

Thirdly, there has been a concerted effort to promote physical and mental well-being. Recognizing the psychological toll of the war, various support systems and mental health services have been established to address the trauma experienced by individuals. Additionally, investments in healthcare infrastructure and the provision of quality healthcare services have contributed to the overall well-being and resilience of the population.

Fourthly, social cohesion and community rebuilding have been significant achievements. Collaborative efforts have been made to restore and strengthen social networks, promote social inclusion, and address social inequalities. Community-based projects and initiatives have played a crucial role in fostering unity, trust, and solidarity among individuals and communities.

Lastly, there has been a focus on promoting gender equality and women's empowerment. Recognizing the important role of women in post-war recovery, initiatives have been implemented to support women's participation in decision-making processes, entrepreneurship, and education. Efforts have also been made to address gender-based violence and ensure equal opportunities for all members of society.

In summary, the post-war period has witnessed notable achievements and the restoration of human capital. The focus on education, entrepreneurship, well-being, social cohesion, and gender equality has contributed to the recovery and development of individuals and communities, fostering resilience and creating a foundation for sustainable growth.

Despite significant losses of human capital, Ukraine has certain accomplishments. Let's outline the main achievements. Firstly, there is a strengthening of national self-identity, confirmed by the results of a survey conducted by the Rating agency (1000 respondents, April 27, 2022). 92 % of respondents consider themselves Ukrainians, while only 5 % consider themselves Russians. From 2008 to 2014, the share of citizens identifying themselves as Ukrainians was 83 %, and 15 % considered themselves Russians. 89 % of those surveyed define the actions of Russian military as genocide against the Ukrainian people.

The overwhelming majority of respondents, 80 %, consider the Ukrainian language as their native language, although only 51 % use it regularly. It is worth noting the positive dynamics of this indicator, particularly a 10 percentage point increase from 2012 to 2022. However, it is difficult to consider the growth rate of Ukrainian language usage in everyday life as satisfactory. This is primarily due to gaps in the state policy regarding the "language issue".

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The Russian military aggression prompted Ukrainians to reassess the Soviet past and their attitude towards the Ukrainian language. The war became a trigger for de-Russification of public opinion in Ukraine and a change in the population's values, which is the second achievement. A sense of pride in their country and patriotism became characteristic of Ukrainians. Ukrainians began to prioritize non-material values such as communication with loved ones, social interaction, mutual assistance, and altruism. Material values became secondary. This led to the revival of an active civic position among the citizens of Ukraine. It can be said that a community of like-minded people united by new values has formed and spread beyond the country's borders.

Thirdly, the change in population values has activated the volunteer movement, which gained momentum after the events of the Maidan and the Revolution of Dignity in 2014. The volunteer movement in Ukraine is characterized by the active participation of concerned citizens in solving societal problems. It is important to note that alongside material contributions, volunteers and concerned citizens have made significant labor contributions and have actively engaged Ukrainians in providing informational and organizational assistance. Examples include assisting territorial defense units in setting up defensive structures, preparing food, finding shelter, helping internally displaced persons find employment, providing professional labor services by doctors, teachers, educators, lawyers, and other experts to those affected by aggression, etc. Special attention should be given to digital labor services on a volunteer basis.

Fourthly, an important achievement is the formation of a national digital culture, which is based on users' ability to distinguish truthful and relevant information and adhere to information security and hygiene. Ukraine is at the initial stage of forming a national digital culture. However, since the start of the war, the majority of Ukrainian users have changed their everyday habits of using internet sources. There has been an increased trust in sources provided by government institutions, a shift in attitude towards personal data protection, and a transformation in behavior on social media. Overall, Ukrainians have become more conscious in their consumption and dissemination of information and adherence to information security rules.

Against the backdrop of the formation of digital culture and due to the advanced digital skills of an active part of the population, the formation of a powerful Ukrainian IT army has taken place. This is an IT community with tasks...

Ukraine has significant reserves for the restoration of human capital. Measures for this restoration should cover two closely interconnected dimensions aimed at creating a favorable environment. The first dimension involves the return of Ukrainian citizens to their homeland, while the second dimension focuses on the development of an effective system for the formation and development of human capital within the country.

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The main strategic directions of state policy in the first dimension should be:

Restoration of the housing stock and civil infrastructure based on fundamentally new approaches. This restoration should go beyond simply repairing broken windows and instead involve the construction of “smart” cities. Such cities are characterized by an intelligent life support system, human-oriented planning, and citizen participation in governance. Residential complexes should meet the needs of people rather than developers.

Programs to stimulate business development and self-employment are a crucial condition for creating an environment that encourages people to return to the country. These programs should have a comprehensive nature and include a system of support mechanisms: financial support (tax incentives, credit programs, investment projects), regulatory support (simplified rules and administration of business regulations), educational support (training on best business practices), and digital support (establishment of a comprehensive digital infrastructure). The restoration of the business environment should be based on the creation of jobs with decent working conditions. Such an approach will create conditions for the return of human capital to their homeland, despite a certain portion finding decent work abroad.

Development and implementation of psychological support programs aimed at family reunification are important complements to the aforementioned measures. Separated families have become a hallmark of war: women with children abroad and men remaining in Ukraine. Each family member has gained their own experience, independently facing challenges and learning to live separately. Family members who have migrated abroad have partially assimilated into a different cultural and social environment. These circumstances can lead to potential fractures within families, which can be exacerbated against the backdrop of an economic crisis. Therefore, it is necessary to develop and implement state-level programs for psychological rehabilitation and family reunification.

The implementation of measures in the first dimension requires complementing them with actions in the second dimension, which should include the following strategic directions:

Reforming the general secondary education system, which should be based on creating a favorable environment for talent development in the country, strengthening the technical component of the educational process, ensuring equal learning conditions in urban and rural areas, and adopting the best global organizational practices. The introduction of digital security and hygiene programs into the educational process should be a sign of the times.

Reducing the number of higher education institutions and instead establishing powerful university centers with modern equipment integrated into the business environment. State policy in this area should focus on creating a favorable scientific

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environment for domestic and foreign investments. Expanding research projects and exchange programs, as well as enhancing the qualifications of academic personnel in domestic higher education institutions through foreign universities, should be pursued.

A significant direction should be the state program for the formation and development of digital culture in Ukraine. This program should include the establishment of principles, values, and mechanisms for implementing national digital culture, the development of digital skills, and the promotion of digital literacy among citizens. It is important to provide access to digital technologies and ensure their responsible and inclusive use throughout society.

In summary, Ukraine's efforts to restore human capital require a comprehensive approach encompassing the return of citizens, the development of a favorable business environment, psychological support for family reunification, educational reforms, the transformation of higher education, and the promotion of digital culture.

In conclusion, the state of higher education in Ukraine has been significantly impacted by the ongoing war. Disrupted academic activities, financial constraints, brain drain, and psychological challenges have posed substantial hurdles for the sector. However, concerted efforts and initiatives aimed at overcoming these challenges are underway, demonstrating the resilience and determination of the Ukrainian higher education community to adapt and thrive even in the face of adversity.

In conclusion, the state of higher education in Ukraine during the war has been severely impacted by infrastructure damage, financial constraints, brain drain, and psychological challenges. However, various measures and collaborative initiatives are being undertaken to address these issues and ensure the resilience and adaptability of the higher education system in Ukraine in the face of adversity.

8. The social responsibility of developing Ukraine's higher education system in times of war

The development of Ukraine's higher education system in times of war carries significant social responsibility. Despite the challenging circumstances, it is crucial to prioritize the well-being and future prospects of students and educators.

Amidst the ongoing conflict, it is essential to ensure the accessibility and quality of higher education. Efforts should be made to create a supportive and inclusive learning environment that addresses the unique needs and challenges faced by students affected by the war.

Promoting educational opportunities and scholarships for students from conflict-affected regions is an important aspect of social responsibility. By providing financial assistance and support, the higher education system can contribute to the empowerment and resilience of individuals in these areas.

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Moreover, fostering partnerships between universities, businesses, and civil society organizations can enhance the social responsibility of the higher education system. Collaborative initiatives that promote entrepreneurship, innovation, and community engagement can contribute to local development and socio-economic stability.

The directions and goals of the comprehensive transformation of Ukraine's higher education system are fully outlined in the Development Strategy for Higher Education in Ukraine for 2022–2032 (hereafter referred to as the Strategy). This Strategy was developed over a year with broad involvement of experts and analytical centers, and it is intended to serve as a roadmap for the construction of the system and the determination of public policies in the field of higher education for the next decade.

The Strategy aims to achieve five strategic goals and includes 25 minor operational goals with indicators for their achievement. For instance, strategic goal 1, “Efficiency of governance in a socially responsible higher education system”, is planned to be accomplished through minor operational goals such as ensuring targeted budgetary funding to enable the acquisition of quality higher education on a competitive basis, enhancing the efficiency of the higher education system and the fulfillment of the state's obligations, preparing demanded professionals to meet the economy's need for skilled workers, promoting the social responsibility of higher education institutions to address social and environmental issues, and ensuring institutional autonomy (including financial autonomy) to guarantee equal rights and broad institutional autonomy. One of the outcomes of achieving this strategic goal is defined as “establishing an effective governance system through a combination of institutional autonomy in higher education institutions and responsible state educational policies”.

Overall, this goal revolves around the development of a new higher education system in which capable universities exist and fully utilize academic and financial autonomy. The key task for this goal is the modernization of the network of higher education institutions.

The modernization of the university network is not a new issue. This problem emerged due to the chaotic process of establishing new universities that took place throughout the 1990s and early 2000s. During this period, numerous new private higher education institutions (HEIs) were established, and a significant number of technical schools managed to elevate their status to higher education institutions to enhance their attractiveness to prospective students. As a result, the number of HEIs in Ukraine doubled. Consequently, many HEIs located in small towns now offer similar educational programs, each with a very small number of students, which hinders both the quality of education and the effective utilization of intellectual and financial resources.

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Several strategic documents adopted earlier emphasize the need to address this problem. For instance, the National Strategy for Education Development in Ukraine until 2021 highlighted the necessity of “aligning the network of higher education institutions and the higher education management system with the development needs of the national economy and labor market demands”. One of the tasks identified in the Human Development Strategy (2021) is the “optimization of the network of higher education institutions, the creation of consolidated regional universities, and world-class universities”.

Optimization of the network of state HEIs is already underway. From 2016 to 2022, the Government made approximately 30 decisions regarding the reorganization of higher education institutions. These reorganizations have taken various forms, indicating the absence of unified criteria and approaches for their implementation. The following methods are notable:

Merging a smaller university with a larger one (e.g., in 2020, Lviv Institute of Economics and Tourism was merged with Ivan Franko National University of Lviv).

Establishing two educational institutions by splitting one university (e.g., in 2021, the reorganization of Kyiv National University of Trade and Economics resulted in the creation of two new institutions: State University of Trade and Economics and Odessa Trade and Economic Vocational College). Renaming (e.g., in 2019, the Institute of Foreign Intelligence Service of Ukraine became the Academy of Foreign Intelligence of Ukraine). Creating a new university by merging multiple educational institutions.

Given the circumstances faced by the higher education system due to the war, the issue of modernizing the network of higher education institutions (which also includes vocational education institutions) will require urgent resolution. Taking into account the relocation of a significant number of educational institutions, infrastructure destruction, and a severe lack of funding, it is necessary to develop approaches and criteria that will enable such modernization of the education network to be feasible and effective. The operational plan for implementing the Strategy, which was approved together with the Strategy, envisioned the development of a medium-term plan for the modernization of the higher education network based on the average number of students in such institutions by 2022. This task has been postponed for at least one year.

At the same time, there are several studies that substantiate possible ways to modernize the education network. For example, in the spring of 2022, a comprehensive analytical review of the competitiveness of the network of state higher education institutions was published, which stated that the national network of higher education institutions is dominated by underpowered institutions that cannot ensure the necessary quality of education. These institutions often duplicate

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programs in the same locality, train professionals in fields that do not correspond to the institution's profile, and consume significant resources.

In April 2022, the President of Ukraine established the National Council for the Reconstruction of Ukraine from the Consequences of the War. The main tasks of this council include developing a plan for post-war reconstruction and development of Ukraine, particularly focusing on social infrastructure. It also involves preparing strategic initiatives for priority reforms that are necessary during both wartime and post-war periods.

During May and June, active work was carried out to develop the Plan for the Reconstruction of Ukraine, which was intended to be presented in the summer. As a result, a draft of the Education and Science Sector Recovery Plan (hereinafter referred to as the Recovery Plan) was prepared. This draft includes seven main goals and a set of tasks and measures to achieve them within the "Higher Education" section.

The draft of the Recovery Plan correlates significantly with the Development Strategy for Higher Education 2022–2032. A substantial portion of the tasks are duplicated or similar. For example, the issue of modernizing the network of vocational and higher education institutions is identified as one of the key tasks in the Plan.

The same applies to other goals and tasks. The draft of the Recovery Plan highlights the need for "expanding budget financing and co-financing of higher education, enhancing the financial autonomy and powers of supervisory boards of higher education institutions", and more.

An important separate goal in the draft of the Recovery Plan is Goal 7, "Restoring the potential of vocational and higher education; ensuring the rights and freedoms of internally displaced persons and residents of temporarily occupied territories in the field of education, restoring the activities of vocational and higher education institutions in the temporarily unoccupied territory." To achieve this goal, four tasks are outlined, including conducting a communication campaign to reintegrate participants of the educational process after the cessation of hostilities and legislative regulation of the restoration of activities of higher education institutions and vocational education institutions in the temporarily unoccupied territories. This task is being carried out. In late December, the Government approved an action plan for executive authorities to restore the temporarily unoccupied territories of territorial communities.

Although the draft of the Plan was not officially approved as of December 2022 and did not acquire the status of an official document, it still serves as a guideline for the government's activities in terms of legislation and developing effective solutions in the field of higher education.

Incorporating courses and programs that address the socio-political and humanitarian aspects of the conflict can also play a significant role. By equipping

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students with knowledge and skills related to peacebuilding, conflict resolution, and human rights, the higher education system can actively contribute to the country's post-war reconstruction and reconciliation efforts.

Overall, embracing social responsibility in the development of Ukraine's higher education system during times of war requires a comprehensive approach that prioritizes accessibility, inclusivity, support for affected individuals, community engagement, and a focus on peacebuilding and reconciliation.

Conclusions and suggestions for further research

1. Analysis of recent studies and the unresolved part of the problem: Based on recent studies, it is evident that there are several unresolved issues within the higher education system. These studies have shed light on the challenges faced in the aftermath of the war, such as the need for modernizing the network of educational institutions, addressing the quality of education provided by smaller institutions, and the duplication of educational programs within the same locality. Despite the research conducted, there are still areas that require further investigation and resolution.
2. Justification of the hypothesis with appropriate instruments and methods: The hypothesis put forward regarding the modernization of the higher education network in Ukraine has been justified through the utilization of appropriate instruments and methods. Analytical reviews and research have been employed to assess the competitiveness of state educational institutions, identify shortcomings, and propose solutions. These instruments and methods have provided a solid basis for justifying the hypothesis and formulating strategies for the development of the higher education system.
3. The state of higher education in Ukraine: The higher education system in Ukraine has been significantly affected by the war and its aftermath. The relocation of institutions, destruction of infrastructure, and financial deficits have posed significant challenges. The need for urgent modernization and development of the educational network has become evident. Efforts are being made to address these challenges, but there is still much work to be done to enhance the quality, accessibility, and competitiveness of higher education in Ukraine.
4. Decrease in the level of democratization in governance at certain universities: There has been a noticeable decrease in the level of democratization in governance at some universities in Ukraine. The war and its consequences have led to a more centralized decision-making process, limiting the involvement of faculty, students, and other stakeholders in university governance. This shift has raised concerns about the democratic principles and participatory decision-

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- making within the higher education system, highlighting the need for reforms to restore democratic practices.
5. Financial situation of higher education in Ukraine in times of war: The financial situation of higher education in Ukraine has been severely impacted by the war. The destruction of infrastructure, relocation of institutions, and overall economic strain have resulted in a significant deficit in funding. This has hindered the development and modernization of educational institutions, affecting the quality and accessibility of higher education. Adequate financial support is crucial to overcome these challenges and ensure the effective functioning of the higher education system.
 6. Loss of human capital due to Russian aggression in 2022: The Russian aggression in 2022 has resulted in the loss of valuable human capital in Ukraine's higher education sector. Faculty, researchers, and students have been affected by displacement, migration, and the disruption of academic activities. The loss of these individuals, along with their knowledge and expertise, has had a detrimental impact on the country's higher education system. Efforts must be made to mitigate these losses and provide support for the affected individuals to rebuild and restore human capital.
 7. Achievements and restoration of human capital in the post-war period: In the post-war period, there have been notable achievements in restoring human capital within Ukraine's higher education system. Efforts have been made to rebuild infrastructure, attract and retain qualified faculty, and create supportive learning environments. Initiatives have been implemented to encourage the return of displaced individuals and promote the integration of students and professionals affected by the conflict. These endeavors contribute to the restoration of human capital and the revitalization of the higher education sector.
 8. The social responsibility of developing Ukraine's higher education system in times of war: Developing Ukraine's higher education system in times of war carries significant social responsibility. It is crucial to prioritize the accessibility, quality, and inclusivity of education. Ensuring the provision of educational opportunities for all individuals, including those affected by the conflict, is essential. Moreover, promoting research, innovation, and interdisciplinary collaboration can contribute to the country's recovery and resilience. The higher education system must actively engage in addressing societal challenges, fostering social cohesion, and promoting democratic values. By fulfilling its social responsibility, the development of Ukraine's higher education system can contribute to the overall recovery and development of the nation during and after times of war. The provided data is not final as the war is ongoing, and

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the loss of human capital will continue to increase alongside the strengthening of civil engagement, national self-identification, and the activation of volunteer movements, including in digital form.

Human capital is the main source for rebuilding the country's economy in the post-war period. In order to bring back human capital to the homeland, a state policy should be developed, which includes the reconstruction of housing and civil infrastructure based on the concept of "smart cities," programs to stimulate business development, and measures for psychological rehabilitation and family reunification. The renewal and modernization of the education system are essential prerequisites for the formation and development of human capital in the country. The introduction of programs on digital security is an integral component. It is important to ensure fair and equal conditions for obtaining general secondary education for all participants in the educational process. The higher education system requires the formation of powerful scientific centers and a reduction in the number of existing institutions of higher education, along with measures to create a favorable scientific environment for attracting investment, expanding international programs and projects. This will serve as a driver for the recovery and development of the economy in the post-war period. The implementation of the aforementioned directions in the education sector should be strengthened by the development and implementation of a national program for the formation and development of digital culture.

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The further development of digital transformation at the global level is promising, which will be based on the construction of a “smart society”, “smart enterprises”, and the transformation of the state into a digital one, which together will contribute to the formation of an integral array of quality services in various spheres of activity. Such a model should adapt to the operational implementation of innovations, increase the level of financial literacy, effective functioning of new paradigms of public administration, and active penetration of citizens to influence the processes of digital transformation and control their actions by the state.

Even though the level of interest in digital transformation began to grow noticeably only in the first decade of the 21st century, the concept of digital transformation dates back to the end of the 20th century with the appearance of the first published research. The study of the problem of the digital economy is a topical topic in the works of domestic and international scientists. Various approaches to defining the concept of “digital transformation” generally do not contradict each other. Such scientists as S. Brennan, D. Kreiss, M. Hammer, D. Chambi, S. Berman, G. Westerman, S. Kalme, D. Bonnet, D. Mazon and others. In their works, scientists offer an expert view on the exact definitions of the concept of “digital business” and its general characteristics, however, the cited studies, based on the fact that the transformation process is relatively fast, do not always fully reveal the entire essence of these concepts.

The analyzed works have high practical significance and are relevant for studying transformational processes at the global level. However, scientists need to understand the concept of digital transformation of the enterprise, digital business processes, etc. This is due to the anticipatory nature of the digitization process, which confirms the relevance of the chosen topic and the need to research advanced trends in this issue.

The purpose of the article is related to a practical generalization of the aspects of digital transformation in the context of its influence on the world trends of the modern market by conducting a statistical analysis with correlation-regression forecasting, followed by a systematization of the identified features and a study of their place among national economic systems.

The digital transformation process, a phenomenon deeply rooted in the proliferation of information and communication technologies, represents a paradigmatic shift in the way societies function and economies operate. This transition, fueled by an expansive amalgamation of data and the ubiquity of cloud technologies, has

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engendered a contemporary socio-economic model. This model, characterized by its agility and efficiency, seeks to recalibrate the structural components of the economy, thereby enhancing labor productivity and overall economic output. Such a seismic shift has profound implications for national economic architectures, necessitating reevaluating and recalibrating strategies to bolster competitiveness in an increasingly digital global landscape. Central to the discourse on digital transformation are three foundational pillars: the technological infrastructures that enable it, the vast datasets that inform it, and the innovative business models that drive its adoption. The digital transformation paradigm can be dissected into seven interrelated dimensions, each playing a pivotal role in shaping its trajectory. These dimensions encompass the accessibility of digital tools, the methodologies for their utilization, the propensity for innovation, the implications for societal welfare, the evolving dynamics of the labor market, the trust frameworks underpinning digital interactions, and the degree of openness in digital markets. The urgency and significance of research in this domain stem from the overarching evolution of the digital economy. This evolution is not merely incremental but transformative, inducing paradigmatic shifts across all facets of the financial market. Such shifts herald the dawn of a new technological era characterized by interconnectedness, data-driven decision-making, and unprecedented levels of innovation.

In the 21st century, the digital revolution is evolving into a new technological framework characterized by the emergence of the post-information society and the blurring of boundaries between physical, digital, and biological realms. The development of the digital economy triggers transformative changes across all segments of the global financial market, incentivizing the transition to a new technological paradigm. The digital revolution refers to the profound and rapid transformation of society, economy, and culture driven by the widespread adoption and integration of digital technologies. It encompasses the fundamental shift from analog systems to digital ones, revolutionizing how information is created, stored, processed, and communicated.

This underscores the relevance of exploring cryptocurrencies in digitizing the global currency system. Even though significant interest in digital transformation only began to grow in the first decade of the 21st century, the concept of digital transformation traces its origins back to the end of the 20th century with the publication of the first research studies.

Digital transformation is a significant paradigm shift in organizational strategy. Its primary aim is to harness technology to develop and enhance a company's business model. This transformation integrates various elements. The digital business strategy and culture serve as the foundational blueprint, guiding the incorporation of technology into business operations. Simultaneously, the effectiveness of

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a company's engagement with its employees and customers in this digital age is paramount. Adopting innovative processes and methodologies is essential to streamline operations and promote growth. Integrating appropriate technologies, which align with the company's goals and challenges, is crucial. Additionally, the role of data and analytics must be recognized, as they provide the necessary insights for informed decision-making. A robust digital strategy and culture set the stage for successfully digitizing a company's products and services. The synergy of these components is vital, ensuring uniform and aligned actions throughout the organization. The technologies chosen must align with the broader business strategy as pivotal tools for analysis and decision-making.

The digital asset landscape is marked by the prominence of two main subsegments: Cryptocurrencies and Non-Fungible Tokens (NFTs). It's essential to note that platforms focusing on decentralized finance (DeFi) and Web 3.0 services aren't included in this classification. The digital asset ecosystem is diverse. Cryptocurrency exchanges, like Binance and Coinbase, facilitate the trading of digital currencies. Trading platforms and brokers, such as Trade Republic and Bitpanda, offer avenues for trading various assets. Neobanks, like Revolut, represent the shift towards digital-first banking solutions. NFT marketplaces, including Opensea and Rarible, are dedicated platforms for NFT trading. Additionally, digital assets linked to virtual worlds, like Axie Infinity, Sandbox, and Decentraland, are gaining traction in the metaverse realm.

Neobanks, often called digital or online banks, represent a new wave in the financial sector, challenging traditional banking norms. Unlike conventional banks with a mix of online services and physical branches, neobanks function entirely on digital platforms, eliminating the need for brick-and-mortar locations. The rise of neobanks can be attributed to technological advancements and a shift in consumer behavior. With the proliferation of smartphones and high-speed internet, banking has become more accessible, allowing users to manage their finances at their fingertips. This digital-first approach resonates with the millennial and Gen Z demographics, who prioritize convenience, speed, and user-friendly interfaces. Neobanks leverage cutting-edge technology, such as artificial intelligence and machine learning, to personalize user experiences and offer tailored financial advice. Their systems are often built from the ground up, ensuring agility, scalability, and reduced operational costs. This modern infrastructure allows them to pass on savings to customers through lower fees and better interest rates. The range of services offered by neobanks is vast. Beyond essential banking functions like checking and savings accounts, many provide seamless international payments, real-time transaction notifications, budgeting tools, and instant card freeze or activation features. Some even venture into the investment realm, offering robo-advisory services and platforms to trade

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stocks, bonds, and other financial instruments. Furthermore, neobanks often prioritize security, employing advanced encryption techniques and biometric authentication methods, such as fingerprint or facial recognition, to safeguard user data and funds. In summary, neobanks are redefining the banking landscape by offering a digital-centric approach to financial services. Their emphasis on technology, customer experience, and innovative offerings positions them as formidable competitors to traditional banking institutions.

Blockchain technology, often hailed as the bedrock of digital transformation and the burgeoning realm of virtual assets, is an intricate amalgamation of cryptography, distributed ledger systems, and consensus algorithms. As we delve deeper into its current developmental trajectory, it becomes evident that its potential extends far beyond its initial application in cryptocurrencies. The core principles of decentralization and transparency, intrinsic to the blockchain, pave the way for a novel peer-to-peer (P2P) economic model, which fundamentally challenges traditional centralized systems. At a national governance level, the implications of blockchain are profound. By introducing immutable and transparent ledgers, processes such as tax and customs declarations, business certifications, licensing, and democratic exercises like voting and referendums can be radically streamlined or reimaged. This not only enhances efficiency but also bolsters public trust in these institutions. On a broader interstate scale, blockchain's potential is even more transformative. It could serve as the linchpin for supranational integration associations, fostering a unified socio-economic environment for citizens across member states. Such a harmonized ecosystem could facilitate standardized pension schemes, labor markets, tax regimes, and identification systems. Furthermore, by leveraging the trustless nature of blockchain, the formation of free trade zones could be expedited, reducing bureaucratic hurdles and fostering economic collaboration. In essence, blockchain's multifunctional capabilities reshape industries and redefine the fabric of global governance and economic structures.

With its inherent decentralization, transparency, and immutability properties, Blockchain technology catalyzes paradigm shifts across various sectors and, notably, in the energy distribution landscape. One salient manifestation of this transformation is the potential to entirely decentralize energy production and consumption, democratizing access and control over energy resources. For instance, through its avant-garde blockchain-integrated distributed energy platform, the Australian enterprise Power Ledger is pioneering a model where energy transactions can bypass traditional centralized utility providers, facilitating peer-to-peer energy trading. This not only optimizes energy distribution but also empowers consumers and producers alike. Similarly, MyBit, another blockchain-driven platform, is revolutionizing asset ownership structures. MyBit is championing the “democratization” of machine ownership and

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the associated revenue streams by serving as a conduit that links investors to futuristic projects. This innovative approach challenges the conventional model where such assets and their income potentials are predominantly under the aegis of centralized financial entities. The platform's ambit spans diverse technologies, encompassing drones, intelligent home systems, autonomous vehicles, 3D printing technologies, and beyond. Further expanding the horizon of blockchain's applicability, Slock.it has introduced a "universal public access network" underpinned by blockchain protocols. This sophisticated platform offers an ensemble of mobile and desktop applications, enabling users to seamlessly locate, purchase, and manage intellectual properties from any global location. Collectively, these advancements underscore blockchain's transformative potential, reshaping industries and redefining traditional operational frameworks.

The enterprises mentioned above function as pivotal market makers, serving not merely as passive entities but as dynamic catalysts within the economic landscape. Their roles are instrumental in expediting the processes of transformational development, infusing the system with the necessary momentum to transition to an advanced operational paradigm. Given the intricate nature of the technologies in question, particularly blockchain, an inherent temporal lag exists before such innovations achieve ubiquitous adoption across sectors. The multifaceted architecture of blockchain, coupled with its nascent stage of development, necessitates a comprehensive understanding, rigorous testing, and iterative refinement before it can be seamlessly integrated into mainstream economic processes. However, even at this juncture, one can discern the profound potential of blockchain as a transformative tool. Its decentralized, transparent, and immutable characteristics position it as a formidable agent for modernizing various facets of the economy, from supply chain management to financial transactions. Thus, while widespread implementation might be on a more extended horizon, the current discourse unequivocally underscores blockchain's potential to revolutionize the economic landscape.

Digital transformation, a term that has gained significant traction in the contemporary business lexicon, encapsulates the comprehensive assimilation of digital technologies across a business's operations. This is not a mere superficial integration; it represents a profound metamorphosis in how companies conduct their operational activities, with a primary objective of augmenting the value proposition extended to their clientele. The journey towards achieving this transformative state is not instantaneous but is a culmination of successive phases of digital adaptations. Each phase embodies distinct characteristics and challenges, necessitating strategic recalibrations at every juncture. These iterative phases of digital evolution carry paramount strategic imperatives for enterprises. They influence many organizational facets, from allocating and optimizing digital resources to the formulation and

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execution of growth trajectories. Furthermore, as companies navigate through these digital shifts, there's an inherent impact on their organizational structures. Traditional hierarchies and operational silos may give way to more agile, cross-functional teams, fostering a culture of collaboration and innovation. Digital transformation is not merely a technological shift but a holistic organizational reorientation, poised to redefine business models, value chains, and stakeholder interactions in an increasingly digitalized global economy.

The endeavor to integrate digital transformation tools into organizational frameworks is intrinsically linked to a myriad of external and internal factors, each playing a pivotal role in shaping the trajectory and outcomes of such initiatives. Foremost among these is the prevailing market development trend within a nation, which can either catalyze or impede the adoption of digital tools based on the country's economic maturity and technological readiness. Equally significant is the size of the enterprise, as more giant corporations might possess the requisite resources for expansive digital overhauls. At the same time, smaller entities might focus on niche, high-impact digital solutions tailored to their specific operational needs. The industry or sector in which a company operates also dictates the nature and extent of digital transformation, given that specific sectors, such as fintech or e-commerce, are inherently more predisposed to digital innovations than more traditional fields. A critical determinant in this digital metamorphosis is the availability of a skilled workforce adept at navigating the complexities of emerging technologies. With a pool of qualified specialists, organizations might find themselves at a technological impasse, able to fully harness the benefits of digital tools. Furthermore, the role of governmental support, be it in the form of regulatory frameworks, financial incentives, or infrastructural developments, must be considered, as state-backed initiatives often serve as catalysts for widespread digital adoption. Concurrently, with the meteoric rise of artificial intelligence and its concomitant technologies, the very fabric of the labor market is undergoing a seismic shift. Jobs once deemed indispensable are now facing obsolescence, while new roles demanding a unique blend of skills and knowledge are emerging. This digital-driven evolution also reshapes consumer expectations, with an increasing demand for digitally enhanced products and services. Consequently, for companies to maintain their market relevance and competitive edge, an agile approach to digital transformation, one that is responsive to these rapidly evolving market dynamics, is imperative.

There are various definitions of the concept of digital transformation. Still, overall, it involves the integration of digital technologies into all areas of business, fundamentally changing companies' operational activities and contributing to the enhancement of value delivered to customers in the result (Table 2.3).

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Table 2.3. Definition of the concept “digital transformation” [167; 361]

No	Author	Definition
1	Michael Fitzgerald (MIT Sloan Management Review, USA)	Digital transformation is the use of new digital technologies (social networks, mobile technologies, analytics, embedded devices) to bring about significant improvements in business (including enhanced customer experiences, streamlined operations, or new business models)
2	George Westerman (MIT Sloan Management Review, USA)	Digital transformation is the use of technology to improve enterprise productivity radically
3	Brian Solis (Altimeter Group, USA)	Digital transformation is the realignment of, or new investment in, technology and business models to more effectively engage digital customers at every touchpoint in the customer experience lifecycle
4	Bob Haynings (University of Alberta, Canada)	Digital transformation is the integration of multiple digital innovations in an organization’s structure, practices, and values, capable of altering, replacing, or supplementing existing principles of company operations
5	Sergiy Bondar (PROSTEP AG, Germany)	Digital transformation is the systematic integration of all economic sectors and the adaptation of their components to the new conditions of the digital economy
6	I-SCOOP	Digital transformation is the profound transformation of business and organizational activities, processes, competencies, and models to fully leverage the changes and opportunities of combining digital technologies and accelerate their impact on society
7	Mykhailo Fedorov (Minister of Digital Transformation of Ukraine in the governments of Oleksiy Honcharuk and Denys Shmyhal)	Digital transformation is the migration of government services online and the digitization of all governmental processes to digitize as many aspects of Ukrainians’ lives as possible, facilitating communication between the state, citizens, and businesses
8	Oleksandr Tymoshenko (IT Director at TechExpert)	Digital business transformation is the shift of a company’s processes and technologies towards more modern and efficient solutions. Digital transformation is an ongoing process
9	Yuriy O. Nikitin (Doctor of Technical Sciences, Ukraine)	Digital transformation is the process of transitioning a company to new modes of operation by implementing digital technologies and digital services, which are based on a strategic partnership of all stakeholders and involve simultaneous software development and assessment of the enterprise’s level of digital transformation
10	I. V. Strutynska (Candidate of Economic Sciences, Ukraine)	Digital transformation is the transition to user-oriented digital technologies. The emergence of new customer interaction tools, such as chatbots, self-service terminals, or online portals, is changing consumer behavior

Thus, the ability of enterprises to implement digital transformation technologies in their activities is influenced by the size of the company, its current technical equipment, and the level of development of digitalization at the state level. Larger organizations are more likely to digitize their business.

Therefore, government assistance to European companies to expand their business and ensure accessibility regarding the possibility of implementing digital

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transformation tools in various types of enterprises is becoming relevant. At the same time, implementing digital transformation is also influenced by the industry in which the company operates. Another area that organizations may need help with in digitization is that some technologies could be more complex and bulky, which causes the process of adapting to changes to be longer and more complex. Sometimes, digital technologies also affect the company's human resources sector [399]. For example, during the pandemic, 93 % of companies were forced to switch to remote work, changing and reorganizing the usual mode, and 62 % faced an increase in customer demand for online purchases and services, which challenged enterprises not to lose the customer base, track and fulfill orders in time. At the same time, 20 % cannot quickly adapt to technological failures [52]. Digital transformation is preceded by several phases of digital changes that carry significant strategic imperatives for firms, influencing their digital assets, growth and development strategies, and organizational structure (Table 2.4).

One of the driving forces for the rapid development of digital transformation and virtual assets, mainly, was the COVID-19 pandemic, which forced companies to adapt to supply chain disruptions swiftly, respond to market pressures, and quickly shift their customer expectations. Consequently, implementing digital transformation tools within the operations of modern organizations is essential for their market positioning and competitiveness. Creating and implementing a digital strategy in business takes 6 months to a year (45 %) or one to two years (31 %). Moreover, 10 % of enterprises manage to create and implement a digital transformation strategy in less than 6 months, mainly seen in micro or small businesses.

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Table 2.4. Phases of Digital Transformation [399]

Phase	Organizational Structure	Digital Resources	Examples	Digital Growth Strategies	Metrics	Goals
Digitalization	«Top-Down» Hierarchy	Digital Assets	Automated procedures and tasks; transforming information into digital format.	Market Development; Product Development; Market Penetration	KPIs; ROI; ROA; Cost-to-serve	Cost savings for more efficient resource allocation to existing operations
Digitization	Separate Departments	Digital Assets, IT Infrastructure, Digital Network Capability	Using robots in manufacturing; implementing digital distribution and communication channels; adding digital components to product and service offerings.	Market Development; Product Development; Market Penetration	KPIs; User Experience; Active Clients (Users)	Cost savings and revenue increase: more efficient production through business process modernization; improved customer experience
Digital Transformation	Separate Departments with Flexible Organizational Form	Digital Assets, IT Infrastructure, Big Data Analysis	Introduction of new business models; digital platforms.	Market Development; Product Development; Market Penetration; Diversification	KPIs; Digital Share; Active Clients (Users)	New cost and revenue model: asset reconfiguration for new business model development

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The crisis caused by COVID-19 has accelerated the digitization of customer interactions several-fold (Fig. 2.3).

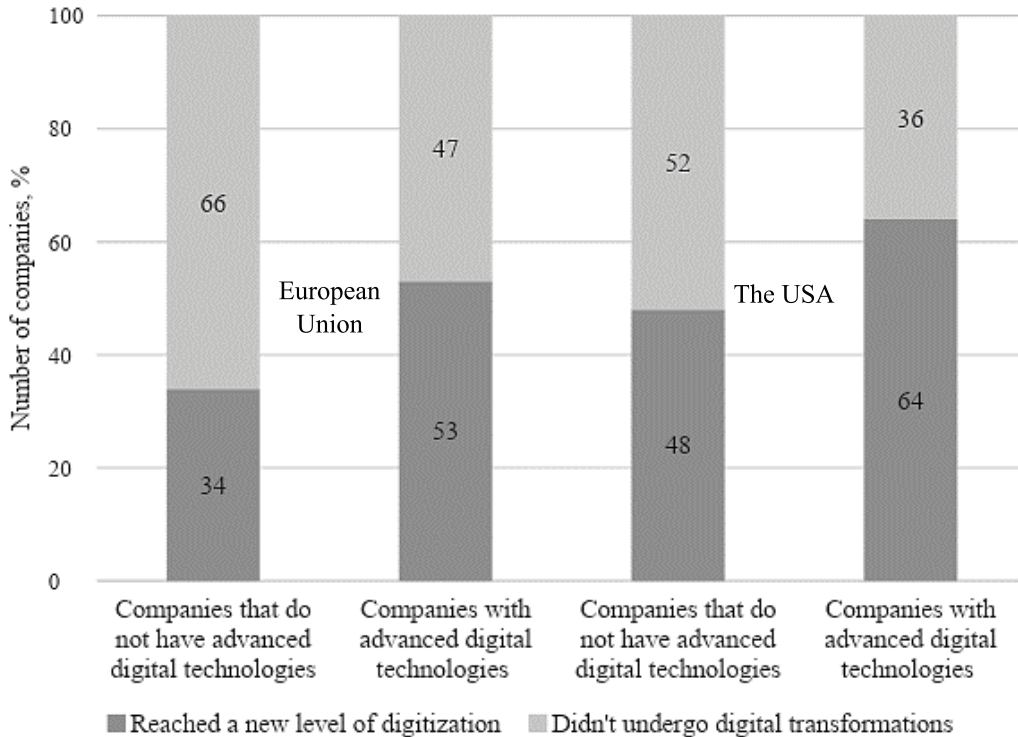


Fig. 2.3. The impact of the COVID-19 crisis on the digitization of various types of companies

Source: [52].

One of the main reasons that significantly impacted the further development of the digital transformation process was the COVID-19 pandemic, which accelerated the digitization of enterprises several times. Europe experienced the highest growth rates, where the growth rate in 2020 compared to 2019 was 71.9 % compared to Asia Pacific (65.6 %) and North America (58.4 %). In general, the corresponding growth rate worldwide was 61.1 %, which indicates that the progress of digital transformation due to the COVID-19 crisis accelerated by an average of 3 years. Currently, 51 % of digital transformation efforts are related to business growth opportunities. In turn, 75 % of the world's enterprises, thanks to the implementation of digital technologies during the COVID-19 pandemic, had the opportunity to fill technical vacancies [361].

Despite the higher rate of growth in the aspect of active digitization of companies in Europe, it is more difficult for European companies that had a low level of implementation of digital technologies in their activities to reach a new level of

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digitization, which is confirmed by the statistical information shown in Fig. 2.3. First of all, this is due to the significant level of costs faced by organizations implementing digital transformation tools in their activities. 28 % of European companies consider digital transformation expensive because approximately 40 % of enterprise technology costs are accounted for by digital transformation [361].

In September 2020, a seminal development in digital finance emerged when the European Commission unveiled a draft regulation tailored explicitly for crypto-assets, colloquially referred to as the regulation of markets for crypto-assets (MiCAs). This draft, rather than being a directive that requires individual member states to transpose its provisions into national law, is a regulation, implying its direct applicability across all EU member states. This ensures a harmonized, pan-European approach to the burgeoning domain of cryptocurrencies and associated digital assets. The core tenets of MiCA are anchored in fostering a transparent and robust regulatory environment. It meticulously delineates provisions that mandate comprehensive disclosure requirements, stringent authorization protocols, and rigorous oversight mechanisms for all activities encompassing these digital commodities' distribution, issuance, and trading. The overarching objective of this regulation is twofold. Firstly, it seeks to instill robust consumer protection mechanisms, ensuring that stakeholders navigating the crypto-asset landscape are safeguarded against potential pitfalls and unscrupulous practices. Concurrently, MiCA is also acutely geared towards thwarting illicit activities that might exploit the digital finance ecosystem. By instituting stringent measures, it aims to combat nefarious undertakings such as market manipulation, money laundering, and the financing of terrorist activities. In essence, the introduction of MiCA underscores the European Union's commitment to fostering a secure, transparent, and standardized digital finance landscape, balancing the dual imperatives of innovation and security.

MiCA sets strict rules for the authorization and licensing of financial intermediaries. It will, therefore, have the most significant impact on issuers, service providers, and trading platforms, which, however, serves the interests of achieving a secure crypto-financial market throughout Europe. Measures such as increased information requirements to inform potential buyers about the characteristics, functions, and risks of crypto-tokens and digital assets are detailed.

The requirements for the informational document that must be prepared for this purpose – the so-called “white paper” – to be submitted to the relevant financial supervisory authority are regulated by Article 5 of the MiCA Regulation. It should include a detailed description of the issuer, the issuer's project, and the type of crypto asset being offered or sought to be admitted for trading. Additionally, a description of the rights and obligations associated with crypto assets is required, as well as disclosure of information about the underlying technologies and standards that the

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issuer of crypto assets uses for maintaining, storing, and transferring crypto assets. A detailed description of the risks associated with the respective assets is also mandatory.

MiCA also contains rules on capital requirements for holding assets and a mandatory complaints procedure available to investors. Issuers of cryptocurrencies backed by significant assets will be subject to stricter requirements, such as capital requirements, investor rights, and oversight. For small companies and fintechs, these provisions can cause certain disadvantages. In Europe, where the market has been mainly unregulated to date, companies face high costs, for example, through the acquisition of licenses or costs incurred with reporting requirements or secure IT infrastructure. Therefore, the regulation will likely make it difficult for cryptocurrency issuers to enter the market.

However, after obtaining a license, strict rules allow for reducing legal and administrative barriers when intermediaries expand to another EU market in another member state to expand their financial services. This is because once a crypto-intermediary obtains a license in one EU member state, this license can become a “passport” under MiCA, meaning the intermediary can operate in another EU country without needing further approval or additional licenses from the local government. The current ambiguous legislative framework in various European countries makes it difficult for companies to establish businesses in this still relatively new area of the capital market. Moreover, different national norms create unequal opportunities for market participants. Against this backdrop, the possibility of “passporting” may lead to simplification in the future.

The key innovation is the regulation of future supervision of crypto asset issuers and service providers by European supervisory authorities and national authorities. According to MiCA, the European Securities and Markets Authority (ESMA) will supervise the issuance of asset-related tokens. At the same time, the European Banking Authority (EBA) will be responsible for overseeing electronic money tokens. To distinguish individual crypto assets, the regulation provides a set of definitions for various crypto assets, including utility tokens and certain stablecoins, thus categorizing different types of crypto assets, each with different legal consequences.

User penetration will be 4.5 % in 2023 and is expected to reach 5.2 % by 2027. It is also expected that by 2027, the number of users in the digital assets segment will reach 412.18 million people. Since 2018, the number of cryptocurrency users has been growing: in 2019, the increase was 75.5 %, in 2020 – 65.2 %, in 2021 – 38.2 %. At the beginning of 2023, 293.67 million cryptocurrency users were registered, and by 2027, their number is predicted to grow by 18.5 % to 348 million [63]. If up to 1 million NFT users were registered by 2021, then in 2021 there is a sharp increase

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to 36 million, and in 2023 their number reached 50 million (Fig. 2.4). At the same time, a slight increase of 3–10 % is predicted over the next four years. The increase in users can be attributed to improved financial literacy of the population in developed countries, greater access to digital resources and tools, and digitization.

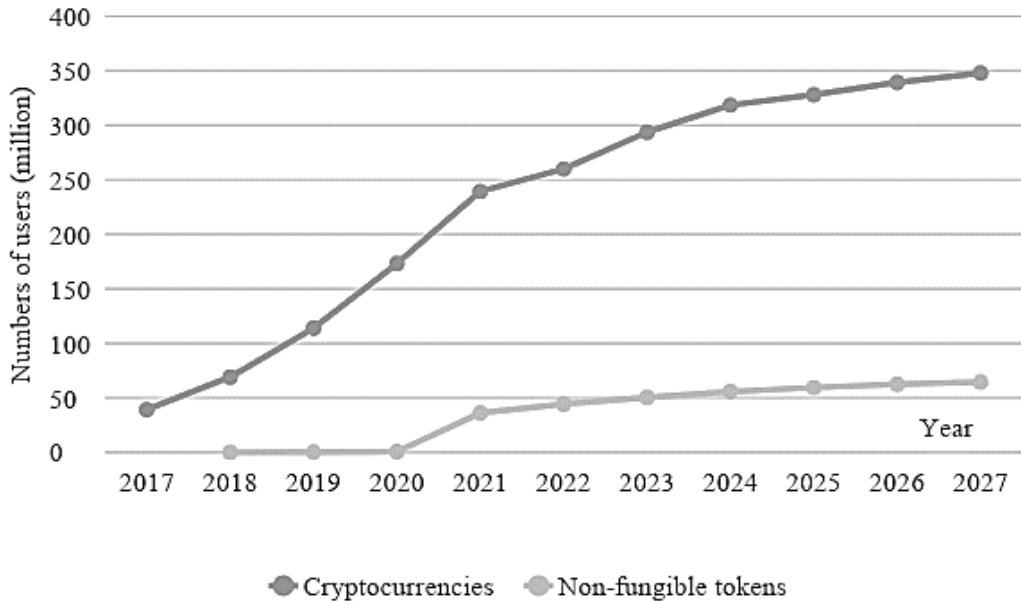


Fig. 2.4. Number of users of digital assets, 2018–2027

Source: [63].

The development of the process of digital transformation and the change in trends in generating income and incurring costs in the relevant industry allow us to conclude that the change in the number of users involved in the processes of digital transformation and virtual assets, which is also influenced by the level of digital development of the country where the users are located. Estimates of crypto asset adoption in each country show that the largest share of crypto asset users and owners are found in countries such as Nigeria (31.9 %), Vietnam (21.1 %), Philippines (19.8 %).

In developed countries like the USA, Switzerland, the Netherlands, the UAE, Canada, and Great Britain, the share of users reaches only 5.1–10 %. This type of asset was the least popular among residents of Denmark, Sweden, and Japan, where the share of such users reached 4.5 % [Table 2.5].

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Table 2.5. Share of respondents who indicated that they use or own crypto assets, 2020 [62]

Country List	percentage	Country List	percentage
1	2	3	4
Nigeria	31.9	Lithuania	8.7
Vietnam	21.1	Egypt	8.3
Philippines	19.8	Norway	8.1
South Africa	17.8	Portugal	8.1
Thailand	17.6	Australia	7.8
Thailand	16.1	Republic of Korea	7.6
Turkey	16.1	Serbia	7.5
Colombia	15.3	Austria	7.2
Argentina	14.4	Poland	7.2
Indonesia	13	China	6.9
Brazil	12.5	Hungary	6.4
Malaysia	12.3	Romania	6.4
Chile	11.7	Belgium	6.3
Saudi Arabia	11.4	United States	6.2
Switzerland	11.1	France	5.6
Greece	11.1	Pakistan	5.6
Kenya	10.5	Canada	5.2
Dominican Republic	10.3	Germany	5.2
Netherlands	10	Finland	5.1
United Arab Emirates (UAE)	10	United Kingdom	5.1
Mexico	9.7	New Zealand	4.9
Ireland	9.6	Israel	4.7
Singapore	9.6	Italy	4.7
Spain	9.4	Denmark	4.4
Morocco	9.3	Sweden	4.3
Czech Republic	9.2	Japan	3.7
India	8.8		

At the same time, the profitability trend in the industry under consideration is also subject to changes. The average revenue per user in the digital asset segment will be \$134.40 in 2023 [63]. In terms of global comparison, the highest revenue will be achieved in the United States (\$23,720.00 million in 2023). The revenue of the digital assets segment is expected to reach \$46,240.00 million in 2023, with a CAGR of 15.07 % (CAGR 2023-2027), leading to a forecast total of \$81,080.00 million until 2027. In 2020, there was a sharp increase in the income of both cryptocurrencies (up to 478.1 %) and NFT (up to 2,160.7 %). The highest income value is observed in

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2021, with an increase of 7.466 %. The trend shown in Fig. 3 also reflects the impact of the Russian-Ukrainian war on the market. So, in 2022, there is a decline in the income of both cryptocurrency and irreplaceable tokens to 5.2 %.

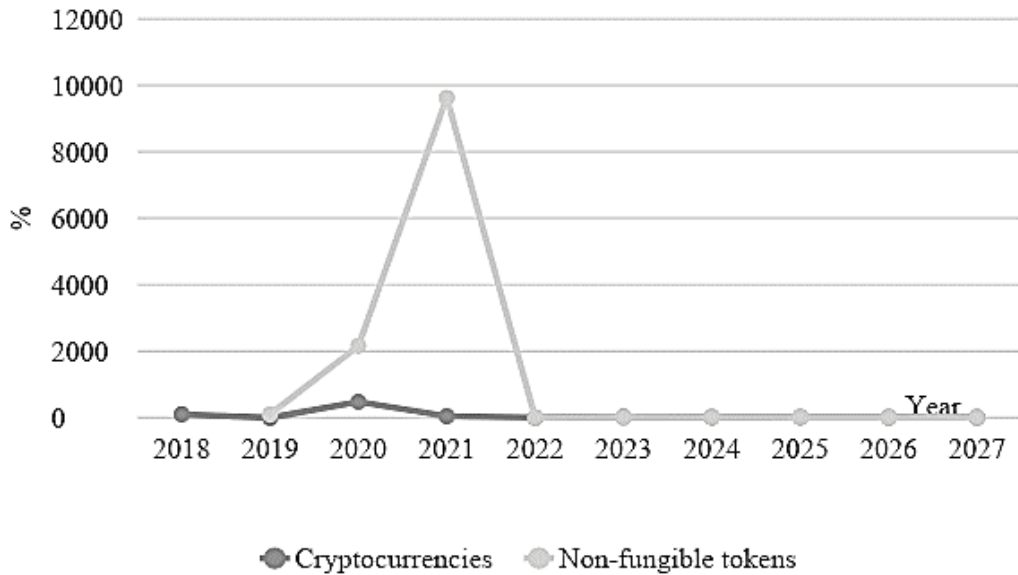


Fig. 2.5. Change in revenues in the digital assets segment, 2018 – 2027

Source: [63].

Until 2027, revenue changes are forecasted with minor fluctuations, ranging from 11 % to 19 %.

Spending on digital transformation technologies and services worldwide continues to grow annually (Fig. 2.6). The global digital transformation market is forecast to grow to \$1009.8 billion by 2025. Investments in digital transformation will reach \$7 trillion in 2023 as companies develop new approaches to digitize their products and services [361]. Thus, by 2025, \$100 trillion is projected to be added to the economy through digital transformation, likely accounting for more than 50 % of GDP.

2.2. Digital transformation and virtual assets: the European experience in the context of European integration

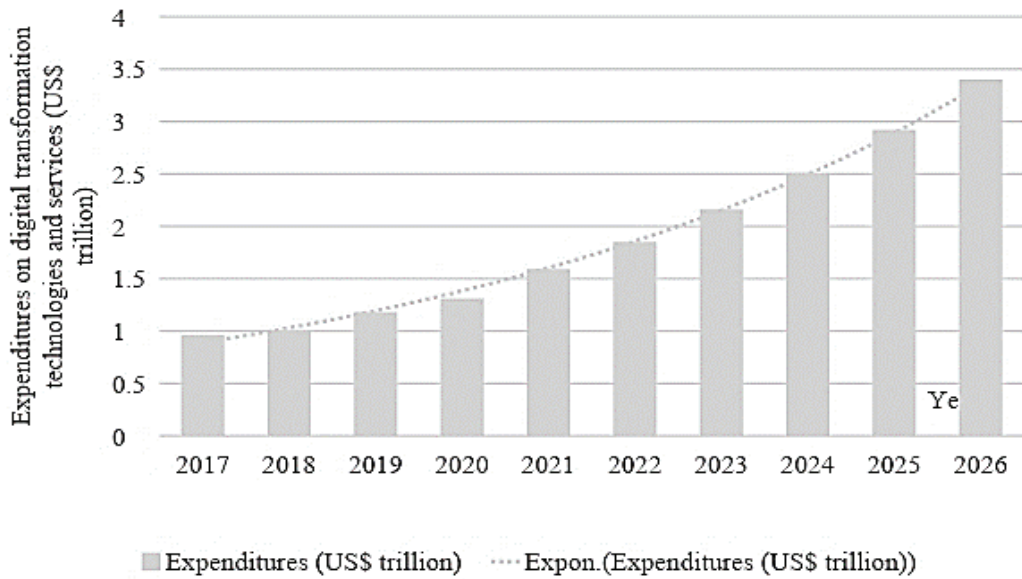


Fig. 2.6. Forecasting the costs of digital transformation technologies and services

Source: [361]

According to data from the European Investment Bank, from 2021, Finland and Malta are considered the most digital countries. Denmark, Austria, the Netherlands, and Sweden also have high indicators [63]. According to EIBIS indexing of corporate digitization, among the EU countries, the Czech Republic had the best indicators for specific categories of development (for the use of advanced digital technologies); Finland (for digital infrastructure and use of strategic business monitoring); Austria (for the spread of digitalization during the pandemic); Cyprus (for investment in software); Sweden (for investing in digital technology training for employees) [64].

Despite some advantages (the creation of new jobs; acceleration of entry to the market; increased competitiveness; creation of an ecological product; etc.) and the need to introduce digital technologies into modern enterprises, more than digitization is needed to guarantee companies success. According to statistics, 70 % of digital initiatives of enterprises still need to be implemented, mainly due to the unsuccessful management of such strategies. Therefore, it is crucial to have a professional management policy in the middle of the organization, which should be based on business strategy, customer experience, employee suggestions, etc. In addition, the key to implementing a digital strategy is having the expertise to lead digitalization initiatives. Currently, 78 % of CIOs say that engagement with the board of directors has increased several times, and 67 % say creating new profitable initiatives is their job responsibility [361].

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Thus, the ability of enterprises to implement digital transformation technologies in their activities is influenced by: the size of the company (Figure 2.7), its current technical equipment, and the level of development of digitalization at the state level.

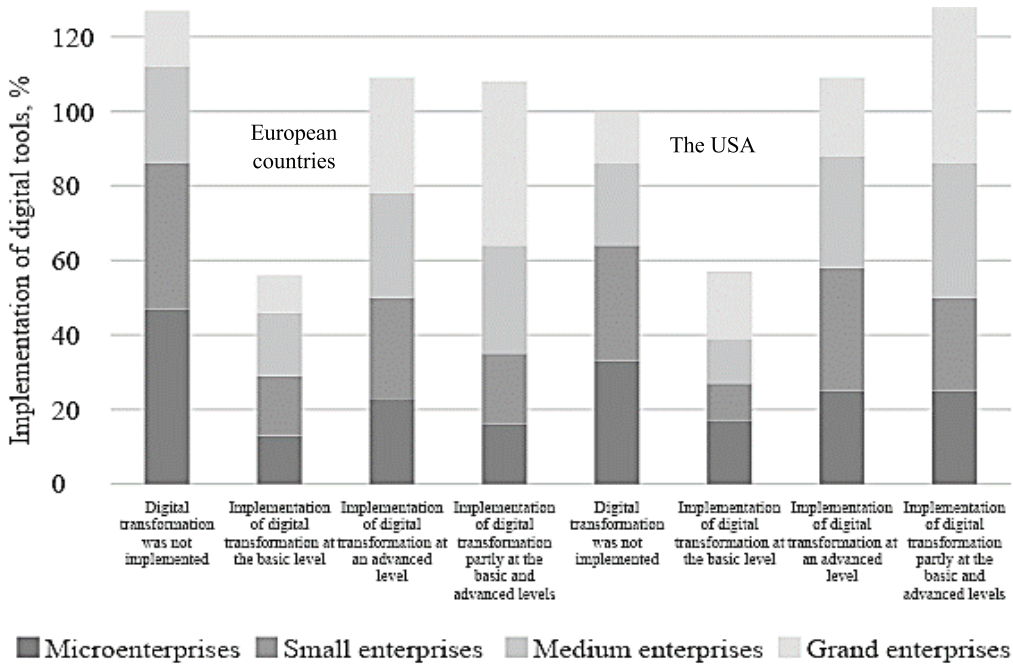


Fig. 2.7. The activity of implementing digital transformation tools at enterprises depending on their size, 2021 [361]

Larger organizations are more likely to digitize their business. Therefore, government assistance to European companies to expand their business and ensure availability regarding the possibility of implementing digital transformation tools in various types of enterprises is becoming relevant.

Another area that organizations may need help with in digitization is that some technologies could be more complex and bulky, which makes adapting to changes longer and more complex. Sometimes, digital technologies also affect the company's human resources sector. For example, during the pandemic, 93 % of companies were forced to switch to remote work, changing and reorganizing the usual mode, and 62 % faced an increase in customer demand for online purchases and services, which challenged enterprises not to lose the customer base, track and fulfill orders in time. In addition, implementing digital transformation is also influenced by the industry in which the company operates (Fig. 2.8).

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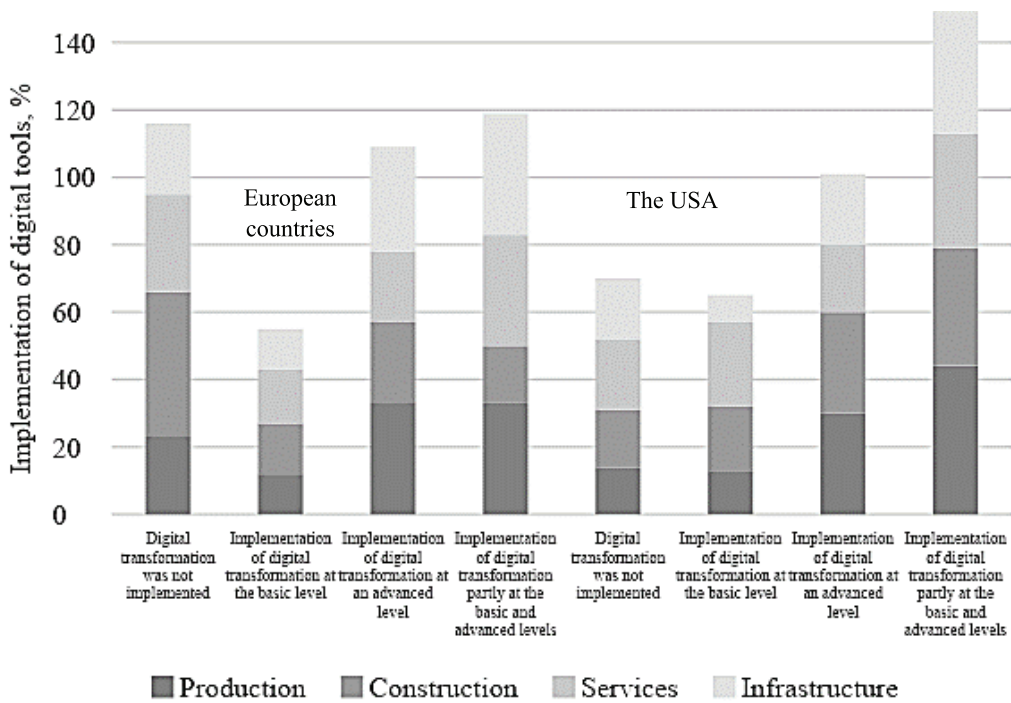


Fig. 2.8. The activity of implementing digital transformation tools at enterprises depending on the industry, 2021 [361]

It is impossible to say unequivocally that digital transformation has a positive or negative effect on the labor market. On the one hand, implementing digital transformation tools is only possible if qualified specialists have specific digital skills. On the other hand, digitalization is changing the labor market, replacing some vacancies with artificial intelligence work or requiring people to acquire new skills and knowledge that require a certain period to acquire (Fig. 2.9).

According to research by the European Commission, 90 % of jobs will require digital skills in the next 5 years. 68 % of managers are sure that successful interaction of people with AI will be the key to the future of business [64]. At the same time, 44 % of people of working age in European countries still need to gain basic digital skills, which indicates the urgency of implementing relevant educational programs and involvement for target groups since the lack of this can cause a shortage of jobs. According to a survey of company leaders conducted by HBR in 2021, 84 % of them are sure that new business opportunities have appeared after implementing digital transformation of their activities [167]. According to a report from MIT Sloan Management, 81 % of companies that have already developed digital technologies cite innovation as a top organizational strength. In turn, 43 % of companies that have reached the level of financial maturity usually have a higher net profit rate than other companies in the corresponding industry [370].

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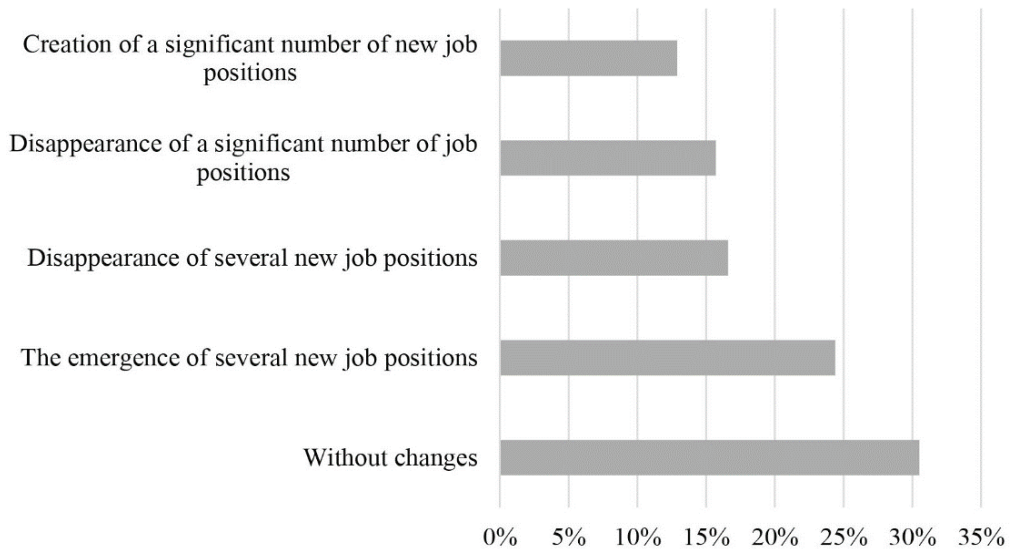


Fig. 2.9. The impact of accelerated digital transformation on the European market, 2021

Source: [52].

The EU continues to stimulate environmentally friendly investments to reduce the high carbon footprint associated with specific cryptocurrencies. Members of the European Parliament have called on the Commission to prepare a legislative proposal by January 1, 2025, to include in the EU taxonomy a classification system for all crypto assets that significantly contribute to climate change. Currencies that operate outside the proof-of-work mechanism and subsequently have a lower carbon footprint may be considered “green” under the EU Taxonomy Regulation.

Artificial intelligence, cloud computing, environmental support, and the Internet of Things are driving forces behind digitization. 69 % of modern digitized companies use digital technologies to reduce carbon emissions, and 58 %, less mature, aim to reduce natural resource consumption.

In the context of whether a token falls under the existing national regulatory framework, it should be noted that cryptographic and digital assets cannot be defined in the same way. With studying the relevant token’s circumstances and characteristics, it is possible to make a regulatory classification due to the diverse and varied design of numerous tokens appearing in the market. NFTs may fall under the definition of “crypto assets” and then be regulated accordingly as a financial instrument under the existing regulatory framework if it is created to obtain monetary gain. Thus, investment purpose is at the forefront.

The leading digital transformation trends during 2022–2023 include hyper-automation, hybrid experiences, distributed environments, and handling big data.

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Global companies, including European ones, are integrating the artificial intelligence system Chat GPT (Generative Pre-trained Transformer) into their operations, launched in November 2022. Chat GPT is an autoregressive language model capable of generating text resembling human-authored content. As of December 2022, OpenAI reports 21 million active users. Implementing this system will provide enterprises with several economic and organizational advantages, including assisting in developing business strategies, rapid composition of blogs, articles, and reports in required styles, writing code, debugging, explaining errors, and more. As a result, time and resource expenditures are reduced since Chat GPT generates text based on input data and information provided by the user.

Digital transformation includes some advantages, among which the main ones can be considered the improvement of work efficiency, the ability to meet the changing expectations of customers, faster entry into the market, and improvement of the quality of new products [62]. Digital companies exceed their business goals three times more often, which applies even to start-up projects (Fig. 2.10).

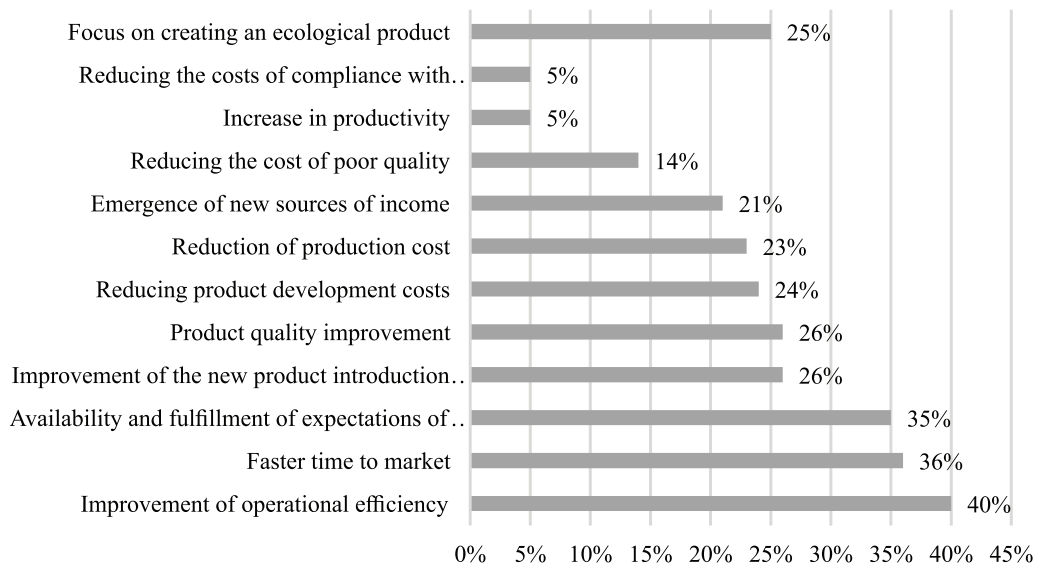


Fig. 2.10. Advantages of digital transformation

Source: [52].

In this context, in Ukraine's digital era landscape, specific transformational trends have emerged as predominant forces shaping the trajectory of businesses and economies during 2022–2023. Among these is hyper-automation, which represents an advanced convergence of machine learning, artificial intelligence, and robotic process automation, aiming to automate complex business processes with minimal human intervention. Concurrently, the hybrid experience trend underscores the blending of

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physical and digital interactions, crafting seamless user experiences across multiple touchpoints. The distributed environment trend, on the other hand, emphasizes the decentralization of workspaces and resources facilitated by cloud technologies and collaborative tools, allowing for flexibility and resilience in operations. Furthermore, the increasing emphasis on big data underscores the importance of harnessing vast volumes of information and employing advanced analytics to derive actionable insights and drive decision-making.

In this context, Ukraine has been making significant strides in its digital transformation journey, particularly in light of its aspirations towards European integration. The country's commitment to fostering a robust digital ecosystem is evident in its performance in global rankings. As delineated in the Global Skills Report 2022, Ukraine has secured the commendable 21st position of 100 countries regarding technological skills. It clinched the eighth spot in the technological competencies ranking [391]. These accolades indicate Ukraine's burgeoning prowess in many tech domains, including but not limited to computer networking, operating systems management, database administration, security engineering, programming paradigms, web development, and cloud computing. Such achievements underscore Ukraine's positioning as a formidable player on the global digital stage, showcasing its potential to lead in various technological arenas. An important aspect that will contribute to the further promotion of Ukraine in international development ratings is the level of digital literacy of the population of Ukraine. According to the data of the Ministry of Digital Transformation of Ukraine, 15.1 % of Ukrainians have no digital skills at all, 37.9 % have "below average" digital skills, and 53 % possess digital technologies at an "average" level [67]. The digital literacy of the population directly depends on the infrastructure component. The Ministry of Digital Transformation of Ukraine promotes the work to improve the literacy of the population. In addition to educational tests and recommendations, the Ministry of Digitization has issued a Digital Competence Framework for Ukrainian citizens, which contributes to the creation of state policy in this matter, helps to more specifically plan educational initiatives, which will be mainly aimed at the ability of Ukrainians to practically use IT tools and services by their personal and professional needs.

In the context of virtual assets, it is worth looking at Germany's experience. Like NFTs, stablecoins can fall under the term "financial instruments" according to Germany's regulatory legislation. Specifically, they can be classified as "accounting units" or "crypto-assets" under KWG or Germany's Securities Institutions Act. This is because the legal definition also encompasses assets that are not alternative means of payment but serve investment purposes. Algorithmic tokens serve this purpose as a potential investment.

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Similarly, as MiCA will require in the future, financial service providers wishing to distribute banking and financial services in Germany on a cross-border basis must establish a subsidiary in Germany to obtain the necessary license. In this regard, Germany's standards align with the new EU norms.

While Germany already provides a national regulatory framework covering crypto and digital assets, a joint EU structure is welcomed. Especially against the backdrop of simplifying cross-border activities of financial service providers in the EU to stimulate the crypto and digital asset sector, it can be anticipated that MiCA will bring real progress to the crypto-financial industry.

Speaking of the US experience, in this country, the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) are the agencies most involved in regulating cryptocurrencies and digital assets. The SEC aims to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.

The CFTC aims to promote the US derivatives markets' integrity, stability, and vibrancy. It aims to safeguard the American public from fraudulent schemes and abuses in these markets. According to the Commodity Exchange Act (CEA), the CFTC oversees derivative instruments contracts, such as futures, options, and swaps involving commodities. Despite the SEC acknowledging that many digital assets are securities, it can be said that the two most significant digital assets, Bitcoin and Ethereum, have been recognized as commodities by both the CFTC and the SEC.

In the United States, cryptographic and digital assets remain largely unregulated, and the crypto community often complains about regulators imposing regulations through enforcement. This is rapidly changing in favor of greater regulatory clarity. Meanwhile, US legislators prefer an approach that would place a significant portion of regulatory oversight of crypto and digital assets under the jurisdiction of the CFTC. On June 7, 2022, two US senators introduced a primary bipartisan cryptocurrency legislation. The bill grants the CFTC exclusive jurisdiction over digital assets with certain exceptions. "Digital assets" are proprietary electronic assets that provide economic, property, or access rights or privileges and are recorded using cryptographic distributed ledger technology. It later defines virtual currency as a digital asset used "primarily" as a medium of exchange, unit of account, or store of value, not backed by a financial asset. Five types of digital assets are explicitly excluded from CFTC jurisdiction and fall under the SEC's jurisdiction. These include digital assets that confer upon the owner any of the following rights concerning the business: (1) debt or equity rights; (2) liquidation rights; (3) interest or dividend payments; (4) profit or income share derived solely from entrepreneurial or managerial efforts of others; or (5) any other financial interest. Additionally, the CFTC has no jurisdiction over NFTs. Despite the constantly evolving regulatory landscape in the United States, it is

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quickly being spotlighted. Furthermore, the Gillibrand-Lummis bill aims to make the United States attractive for cryptocurrencies and digital assets by providing greater regulatory clarity.

It's also worth mentioning the experience of the United Arab Emirates (UAE) in this context. The UAE positions itself at the forefront of virtual assets. A comprehensive structure for all commerce and activities related to the metaverse is also being developed there. It's important to note that the UAE is a federation of seven individual emirates, each governed by its own rules and regulations, while all emirates are subject to federal law.

In this complex jurisdictional system, several approaches to regulating cryptocurrencies and digital assets have emerged and are evolving. In April 2018, the federal government published the Emirates Blockchain Strategy 2021 (EBS), which outlines the nation's goal to create a framework and environment where blockchain technology thrives. The government committed to moving 50 % of all state transactions onto the blockchain by 2021, estimated to result in AED 11 billion in savings from transactions and documents that are regularly processed, 398 million printed documents annually, and 77 million working hours per year.

After EBS, the Dubai Blockchain Strategy (DBS) was adopted to create a roadmap for blockchain technology implementation in Dubai and establish an open platform for technology exchange with cities worldwide. The Abu Dhabi Global Market Financial Services Regulatory Authority (ADGM FSRA) became the first UAE regulator to issue a comprehensive set of rules, instructions, and provisions for virtual assets and cryptocurrency activities. They also introduced a unique framework for regulating spot virtual assets, including those conducted by multilateral trading facilities, brokers, custodians, asset managers, and other intermediaries.

The new regulatory regime established rules for managing risks typically associated with businesses involving virtual and cryptocurrency assets. These rules cover risks related to market manipulation, financial crimes, consumer protection, technology management, storage, and exchange operations.

The UAE regulates virtual and crypto assets between the UAE Securities and Commodities Authority (SCA) and the Central Bank of the UAE (CBUAE). SCA is responsible for regulating crypto assets that are considered products or securities. SCA's rules apply to anyone in the UAE offering, issuing, or advertising crypto assets; anyone providing cryptocurrency custody services and/or operating a platform for raising funds through cryptocurrencies and/or a cryptocurrency asset exchange in the UAE; and anyone engaging in other financial transactions in the UAE related to crypto assets (Article 3 of SCA Rules). CBUAE regulates all currency-related transactions within the UAE. On September 30, 2020, CBUAE updated its regulatory framework for digital payments, issuing the Stored Value Facility Regulation (Circular No.

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6/2020) (SVF Rules). The SVF Regulation aims to provide a foundation for the operation and regulation of crypto assets.

Numerous projects, initiatives, and developments are already encouraged as the UAE positions itself as a leader in laws and regulations related to the metaverse. Any company looking to expand its presence in the metaverse will find a tax-friendly business environment with supportive legislative foundations in the UAE.

Analyzing Ukraine's current situation, work is underway to update the regulatory legal act regarding cryptocurrencies to align national legislation with European standards. Changes will be made to the Ukrainian Law "On Virtual Assets," the primary legislative act concerning the country's crypto space, following the provisions of the European Union's legislative package on cryptocurrency markets (MiCA).

The Ukrainian parliament passed the first law in 2021, but President Volodymyr Zelensky returned it with some recommendations. The Verkhovna Rada adopted the revised bill in February 2022, and Zelensky signed it in March. The legislation concerning virtual assets (VAs) may change significantly, as the report indicates. The National Securities and Stock Market Commission (NSSMC), the National Bank of Ukraine (NBU), and industry representatives are also working on amendments. The review might even impact the adopted classification of virtual assets. The terms of the initial VA proposals will also be reviewed [391].

The NSSMC emphasized that updates are necessary to develop taxation rules for cryptocurrencies, which will be introduced through a separate bill. The legislation in that area will only come into effect after changes to the Tax Code of Ukraine.

The government's efforts to regulate the crypto space began after Ukraine gradually became a leader in cryptocurrency adoption in the region and beyond. In June 2022, Ukraine obtained candidate status for EU membership. In early July, key participants in the complex legislative process of the European Union—Parliament, Council, and Commission—agreed to introduce MiCA in a bloc of 27 countries [391].

The law "On the Legalization of Cryptocurrency" awaits the President's signature. Still, it can already be said with a high degree of certainty that digital assets within our country's territory are legalized. There have been numerous disputes regarding digital assets, primarily related to legislative regulation, as it's necessary to establish a clear framework for the circulation of cryptocurrencies, conducting operations, and taxation.

Today, virtual assets and operations related to them are in the shadows. The new law's goal is decriminalization and transparency of operations involving crypto assets. The new regulatory document covers the following areas: virtual asset circulation, rights and obligations of owners and participants in operations, state policy, rules for creating and issuing digital assets, and the procedure for conducting transactions.

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At the legislative level, such assets will be recognized as intangible goods that can be the subject of civil legal relations. The new law will also clearly define “virtual assets”. This refers to a data set with a determined value that operates through a specific (unique) system.

It’s important to note that legalization does not confirm that cryptocurrency will become a full-fledged payment instrument within the territory of Ukraine. The legislative innovations do not place cryptocurrencies on the same level as fiat currency. These assets cannot be used to exchange or purchase goods or services.

To acquire the status of a virtual asset owner, there are several methods, including creation, acquisition through legal actions, by law, or based on a court decision. Owners have full rights to possess, conduct operations within systems, and even dispose of their assets. In cases of restrictions on civil rights, such as withdrawal from circulation, these restrictions will also apply to virtual assets.

The status of service providers is established at the legislative level. The rights and obligations of entities conducting operations in their interest are also defined. Such functions can only be carried out by legal entities that meet specific requirements, such as a good business reputation and a minimum statutory capital size (ranging from 70 to 350 thousand untaxed minimum citizen incomes).

Virtual service providers will have the right to engage in the following activities involving crypto assets: storage, administration, exchange operations, transfers, and intermediary services. To obtain this status, they must undergo a registration procedure and obtain permission from the Ministry of Digital Transformation of Ukraine. The prohibition of engaging in such activities extends to entities with minimal connections to aggressors concerning Ukraine.

To obtain permission, a package of documents must be prepared, including a formal application, access code to the articles of incorporation in the Unified State Register of Legal Entities, documentary proof of good business reputation, documentary proof of the legality of capital formation sources, a description of the company’s structure, and receipts or payment orders confirming the payment for the permit. The permit’s validity period is 1 year.

The recent legislative enactment introduces a rigorous framework to ensure accountability and compliance within virtual assets. This legal framework, grounded in meticulous research and understanding of the digital asset landscape, delineates specific rules and requirements that entities operating in this domain must adhere to. A salient feature of this legislation is establishing a clear punitive structure to address violations. The Ministry of Digital Transformation, acting as the supervisory body, can impose sanctions, particularly fines, for a spectrum of infractions. Firstly, entities that embark on operations without procuring the requisite permissions are liable to face penalties, underscoring the importance of regulatory compliance. Similarly,

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overstepping the boundaries of a granted permit, especially by engaging in activities involving crypto assets that are not explicitly authorized, is deemed a contravention. The legislation also emphasizes the sanctity of information integrity. As such, entities that furnish false documents or provide misleading information, either deliberately or due to negligence, are subject to punitive measures. Furthermore, the law underscores the criticality of timely and accurate reporting. Violations of the stipulated reporting mandates in frequency, content, or format are actionable offenses. Additionally, the legislation mandates service providers to promptly notify the regulatory body of any significant alterations in their operational paradigm. Delays or lapses in communicating such changes, especially if they bear regulatory compliance or consumer protection implications, are also subject to penalties. In essence, this comprehensive legal framework seeks to foster a transparent, accountable, and secure ecosystem for virtual assets, balancing the imperatives of innovation with the need for robust oversight.

In the area of digital transformation of the economy, in August 2023, the Government of Ukraine’s efforts were aimed at continuing digital transformation and protecting the rights and freedoms of citizens to ensure the sustainability of the economy and the state’s defence capability on a new regulatory basis. The main processes in this area are presented in Table 2.6.

Table 2.6. The Government of Ukraine’s efforts to continue digital transformation and protect the rights and freedoms of citizens to ensure the sustainability of the economy and the defence capability of the state

Action	Result
1	2
Adoption by the Verkhovna Rada of Ukraine of draft laws on the development of the digital economy that regulate the provision of digital services [67], the circulation of digital content and digital things [69]	The introduction of such legal provisions will stimulate the development of the digital economy and allow this new sector to attract additional funds to the country. In particular, the draft Law «On Amendments to the Civil Code of Ukraine Aimed at Expanding the Range of Civil Rights Objects» introduces a new civil rights object – a «digital thing» – to the Civil Code of Ukraine. The draft law «On Digital Content and Digital Services» describes the specifics of circulation of digital content as a type of digital thing, as well as the specifics of providing digital services. Adoption of the draft laws will allow virtual assets to be considered a separate type of digital thing and integrate the virtual asset industry into the traditional economy of Ukraine

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End of table 2.6

1	2
Adoption by the Verkhovna Rada of Ukraine in the second reading of the draft law «On Registration of Domain Names» [70]	It establishes requirements for the placement of elements of information and communication systems used to ensure the functioning of the Registry and operations with domain names in the .gov.ua domain and for the owners of such information and communication systems. The Committee on Digital Transformation also recommended that the Verkhovna Rada of Ukraine adopt in the second reading a draft law on improving public administration and regulation in the provision of cloud services [238]. Adoption of the provisions of the draft law will help improve: service continuity and quality management; security and data protection management; protection of information in the cloud computing system from internal and external threats, cyber attacks (which is extremely important for the economic stability of the state, especially during military aggression)
Adoption by the Cabinet of Ministers of Ukraine of a resolution approving the requirements for the list of qualified electronic trust service providers and information on the services they provide [244]	Such requirements will facilitate the approximation to digital visa-free travel with the EU and bring Ukraine’s legislation in the field of electronic trust services in line with European and international standards, which will greatly simplify electronic interaction with European partners through the full use of Ukrainian electronic signatures in the EU, in particular when doing business. In addition, the Government adopted resolutions on the requirements for the use of and conformity assessment in the field of trust services [373], which define the requirements for the use of qualified electronic trust services in public institutions and regulate the rules for conformity assessment in the field of trust services
Launch of the national acceleration programme “Vlasne”, implemented by the network of entrepreneur support centres “Diia.Business” (for UAH 4 million) with the assistance of the international technology company Mastercard and PrivatBank	The programme aims to create a favourable environment for SMEs in Ukraine, where cashless payments are becoming the standard for economic recovery [389]
Ukraine has joined the National Pavilion Account pilot innovation project, which is one of the activities of the EU4Digital eCommerce accelerator	The project aims to: harmonise e-commerce in priority areas with the EU; pilot solutions that will promote the development of both cross-border e-commerce with the EU and key areas of the digital economy and society to ensure economic growth; create more jobs; improve people’s lives and help businesses [227]. Support for small and medium-sized businesses through the Made With Bravery marketplace will help SMEs enter large marketplaces and foreign markets. Based on the test results, the European Commission will develop recommendations for the Eastern Partnership countries, including Ukraine, for the large-scale implementation of the national pavilion
Ten Ukrainian companies will be able to participate in the largest comprehensive technology exhibition in Japan – CEATEC 2023	It aims to implement Society 5.0, the next phase of digitalisation based on the Japanese model, where technologies such as Big Data analytics; predictive analytics; machine learning; artificial intelligence; new generations of robots/cobots, etc. play a key role [1]. At the exhibition, the Ministry of Digital Transformation of Ukraine, with the support of the Ministry of Internal Affairs of Japan, will organise the National Stand of Ukraine

2.2. Digital transformation and virtual assets: the European experience in the context of European integration

The development of micro, small and medium-sized enterprises, the resumption of business activity, and their desire to succeed despite the war are key to the country's development and economic resilience, especially in the face of aggression. The EU4Business grant assistance to microbusinesses in August is yet another example of the reliable and effective support provided by international partners to Ukraine's economy. The approximation of domestic legislation to that of the EU will stimulate the development of the digital economy and allow this sector to attract additional funds to the country.

Experts believe that making long-term predictions at this juncture is premature. Adopting the new law is justifiable and rational from a legal standpoint. Its practical impact will only be assessable after implementing all proposed plans and the complete launch of a robust digital assets market in Ukraine. Consequently, as Ukraine has acquired candidate status for EU membership, aligning national legislation with European standards becomes essential. Substantial changes will be noticeable once relevant amendments are incorporated into the Tax Code. Only then will the digital market be able to operate comprehensively.

Digital transformation and virtual assets play an essential role in the development of the modern world. Due to the rapid development of technology and changing consumer demands for products and services, companies must quickly adapt to these changes to remain competitive. One of the critical elements of digital transformation is using virtual assets, such as cryptocurrencies, tokens, virtual items, and others. These assets provide new opportunities to store and transfer information, reduce transaction costs, and provide greater security for financial transactions. However, the use of virtual assets also has its risks. Lack of regulation and transparency in this sector can lead to financial fraud and loss of confidence in these assets. Therefore, it is necessary to ensure the safety and protection of investors in this sector. In general, digital transformation and virtual assets are integral elements of the development of the modern world, but they also require a responsible and careful approach to their use.

2.3. Approaches to minimizing risks in the bank's anti-crisis management system

The formation of a market-type economy necessitates the creation of a reliable banking sector that is resistant to the influence of external and internal threats in conditions of increased macroeconomic instability. Anti-crisis bank management is one of the ways to solve this problem.

Ensuring the efficiency of banking institutions requires the fulfillment of certain requirements, among which one of the most important is a high level of their economic security. To date, the results of the macroeconomic instability of the Ukrainian economy are an increase in the level of crime in the banking sector, unfair competition, a low level of public trust in banks, which, in turn, significantly affected the level of economic security of banking institutions.

Modern trends characteristic of the current stage of development of the world economy, namely: financial globalization, fierce competition, the introduction of new banking products, the development of information technologies – all this significantly complicates the functioning of banking institutions, increases the likelihood of risks in their activities, contributes to the active spread of crisis phenomena and expanding their sphere of influence. The current state of functioning of modern financial markets necessitates the introduction of anti-crisis management, which requires the development and implementation of anti-crisis management mechanisms by banking institutions, which would make it possible to minimize the occurrence of financial crises and ensure the financial stability of the banking sector.

Anticipating crisis situations and reducing their negative consequences to a minimum level is especially important for banks, as they play a connecting role in the movement of financial resources in the country's economy. The smooth movement and redistribution of monetary and capital resources depends on the financial stability of banks. Implementation of traditional approaches to the localization and neutralization of crisis phenomena in the absence of effective anti-crisis management implies a transition from a potential crisis to the liquidation of a bank, from the problems of an individual bank to the destabilization of the banking system as a whole. Therefore, the relevance of anti-crisis management of the bank is due to the instability of the economic situation, which requires the development of appropriate measures in the risk management system of banking activity. An important task of anti-crisis management of the bank is to find effective methods of organizing the anti-crisis management system.

Features of anti-crisis management of banking activity were studied by such domestic and foreign researchers as: O. Adamska, R. Brealey, E. Dudareva, V. Kovalenko, T. Mostenska, L. Perehrest, S. Ramazanov, S. Rodchenko,

2.3. Approaches to minimizing risks in the bank's anti-crisis management system

T. Smovzhenko, L. Strelbytska, O. Timashova, T. Tohtamysh, and others. However, in the conditions of dynamic economic changes, the constant influence of destabilizing factors, the issue of effective organization of the bank's anti-crisis management process becomes more and more necessary for a detailed study taking into account the current conditions of the functioning of the national economy.

Bank security is an important component of the economic security of the state, which generally characterizes balance, resistance to internal and external threats, the ability to ensure the effective functioning of the national economic system and economic growth of the state. Most researchers consider bank security as the protection of the financial interests of the state or such a state of the budgetary, tax, banking, currency, monetary credit systems, which is characterized by the balanced action of all instruments of the financial market of the state and resistance to the influence of internal and external factors.

The basis of the banking system are banks, which, through the accumulation and redistribution of financial flows, affect the financial, investment, production and other spheres of the economy. In countries with bank-oriented financial systems (to which Ukraine belongs), banks play a more significant role - due to their uniqueness, they are often locomotives of economic growth [296]. However, it should be noted that the inextricable connection between the banking system and the economy has a dual interdependent nature. A vivid example can be the situation when the general economic recession leads to the destabilization of the banking sector, as a result of which the conditions for the provision of banking services deteriorate, which in turn leads to the further decline of the economy [162].

However, the study of specialized literature on this issue shows that there is still no single universally recognized definition of the concept of "security of the banking system". We will give the key definitions of concepts in this area, which have become the most widespread in domestic literature and legal acts:

- banking security – the level of financial stability of the country's banking institutions, which allows to ensure the effectiveness of the country's banking system and protection from external and internal destabilizing factors, regardless of the conditions of its operation [278];
- security of the banking system – the ability of the banking system to stably and reliably ensure the financial stability of the state, to effectively form, protect against excessive depreciation and rationally use the country's financial resources to ensure its socio-economic development and service of financial obligations [334];
- economic security of the banking system – the state of the banking system, according to which its financial stability or reputation cannot be undermined by the purposeful actions of a certain group of individuals

2.3. Approaches to minimizing risks in the bank's anti-crisis management system

and organizations or by the financial situation developing inside and outside the banking system [278];

- financial security of the banking system – the state of the banking system, which provides conditions for its stable and effective functioning, maximization of profit and optimal use of its resources for the socio-economic development of the country. Under such conditions, financial stability is maximally protected from purposeful actions of a certain group of individuals and organizations or the financial situation arising from outside and inside the banking system [341].

O. Baranovsky pays great attention to the problem of ensuring the security of banking activity. He gives the following definition of the financial security of a commercial bank: a set of conditions under which potentially dangerous actions or circumstances for the financial condition of a commercial bank are prevented or reduced to such a level that they are not able to harm the established order of operation of the bank, the preservation and reproduction of its property and infrastructure and prevent the bank from achieving its statutory goals; the state of protection of the commercial bank's financial interests, its financial stability, as well as the environment in which it operates [214].

Summarizing the above, the security of the bank is a state of sustainable life, which ensures the realization of the main interests and priority goals of the bank, protection from external and internal destabilizing factors, regardless of the operating conditions.

The bank's security system is a dynamic organization of authorized structures that implements legal, organizational, technical, investigative, forensic, criminological measures on its own with the aim of protecting the property, infrastructure and order of operation of the credit organization from illegal encroachments. Such a system is created taking into account the need to protect the bank from all known types of negative influences and their consequences. The main requirements for the security system are its reliability and efficiency [422].

Among the types of bank security, we can highlight [265]:

- personal safety – the ability of each bank employee to resist threats to his health, life and professional activity based on mastering the norms and rules of safe behavior. It is achieved by the observance of precautionary measures by all employees, the implementation of special security measures for bank employees; study by each employee of the rules of behavior in difficult conditions and extreme situations, competent actions in them [315];
- collective security – the ability of the bank's divisions to ensure an effective mode of operation under the influence of various destabilizing factors. It is achieved by creating a benevolent, calm atmosphere in collectives, observing

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- the principles of justice, competent stimulation of work; constant study of the psychological situation in teams, timely detection of increased tension in employee relations, prevention and quick resolution of conflict situations; implementation of regime measures, protection of the territory, buildings and premises; constant inspection of the condition of buildings and equipment, certification of premises, implementation of fire prevention measures [358];
- economic security – a state in which the economic development and stability of the bank's activities are ensured, the protection of its financial and material resources is guaranteed, the ability to respond adequately and without significant losses to changes in the internal and external situation. It is achieved by creating an effective set of measures to protect the bank's electronic payment system and prevent the outflow of funds through falsification of financial documents; the availability of places for storing cash, valuables, technical means, transport and bank equipment that meet the established requirements, and their skillful operation; competent organization of security and regulatory measures in the bank; creation of an environment of careful attitude to the bank's property, strict and inevitable responsibility for theft of material assets and their damage; effective planning of events and compliance with fire safety rules; a balanced policy of the bank's management in all areas of banking activity, which ensures justified risk and effective investment of money, and other measures [214];
 - and information security – a state that ensures the necessary level of awareness of its management, staff, as well as the external environment and effective protection of all types of information from external and internal threats. It is achieved by organizing the collection of information about the internal and external environment of the bank, conducting information and analytical research of clients, partners and competitors, information audit and information monitoring in the bank, analytical processing of information; the organization of the information support system for bank management decisions; defining the categories of banking information and developing appropriate measures for its protection; compliance with the relevant regimes of the bank's activity; compliance by all employees of the bank with the norms and rules of working with information; timely detection of attempts and possible channels of information leakage and its termination [358].

Implementation of security measures is ensured through the activities of security forces and the use of various means. Depending on the way security is organized, its forces are represented by: bank security units, specialized firms, organizations that provide security services to banks, and bank personnel. Security means include technical means of protection, software and technical means of information protection, special means and equipment, engineering and technical

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means of limiting access, means of communication, processing and transmission of information and other equipment and machinery used to ensure the effective implementation of security measures.

It should be noted that the security of banks, as well as other commercial structures, is ensured by all their divisions and employees. It cannot be effective if it is carried out by one person, even if only one the most professional division or a specialist.

Destructive changes in the internal and external environment of banking activity cause the appearance of various threats and risks, which, as practice shows, are of a financial and economic nature. These threats arise as a result of insufficient adaptation of the bank's activities to constant changes in market conditions; general insolvency of business entities; increase in crime; consumer mentality of citizens; insufficient legal regulation of banking activity or the professional level of part of the management and employees of banks. That is why the correct understanding and differentiation of risks, threats and dangers by the management and staff of the bank is the basis for making strategic management decisions when developing an effective mechanism for ensuring bank security.

To characterize the level of protection of the bank and its specific operations from potential danger in economic science and banking practice, the concept of "risk" is used, which is a constituent element of the concept of "danger".

Threats to the security of the bank are potentially possible or real actions of intruders or competitors capable of causing material damage to the bank. They appear as a set of factors and conditions that create a danger for the normal functioning of the bank in accordance with its tasks and interests.

In the process of activity, all banking institutions, regardless of specialization, are faced with various forms and types of risks that can both positively and negatively affect the results of the bank's work. In modern economic literature, the concept of risk is considered as an objective-subjective category of activity that is related to overcoming uncertainty in a situation of inevitable choice and reflects the measure of the expected result and is not only a negative, but also a positive phenomenon [214; 334].

From the point of view of the activity of banks in the market of financial services, banking risk is understood as the threat of the bank losing part of its resources, failure to receive planned revenues, as well as the possibility of obtaining additional profit in the event of the implementation of certain financial risks acceptable to the bank [417].

Depending on the sphere of occurrence or impact, risks are divided into external and internal [162]. External risks include risks not related to the activities of the bank or a specific client. We are talking about political, social, economic, geographical and

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other situations and the losses caused by them to the bank and its customers. External economic risks of the bank, not directly related to its activities, include: instability of exchange rates; inflation; insolvency or bankruptcy of the bank's clients, its refusal to make payments and failure to pay the debt on time; change in the price of the product after the conclusion of the contract; errors in documents or payment for goods; abuse of clients or embezzlement of currency funds by them, payment by forged banknotes, checks.

Internal risks include risks that arise directly in connection with the activities of a particular bank. The wider the circle of clients, partners, bank connections, banking operations, services, the more internal risks accompany his work. Compared to external, internal risks are better identified and quantified.

Internal risks are divided into risks in the main and auxiliary activities of the bank. Risks in the main activity are a widespread group of types: credit, interest, currency, risk from settlement operations of the bank and operations with securities. Risks in the auxiliary activities of the bank include losses from the formation of deposits, risks of banking abuses, risks of loss of the bank's position in the market, loss of the bank's reputation, etc. They differ from risks from the bank's core business in that they often have only a conditional, indirect assessment and are expressed in lost profits.

In Ukraine with a purpose implementation banking supervision of the NBU nine categories risk. These include: credit risk , risk liquidity , risk changes percentage rates , market currency risk, operational and technological risk, risk reputation, legal risk and strategic risk [106]. These type and risks not is mutually exclusive . Any - any bank product or service may expose bank on sprat risks.

In modern conditions economic development of Ukraine stored in high level vulnerability banking sector and him institutions of accumulated them both existing and new risks, crisis situations and threats security of banking activity.

Anti-crisis management is one of the functional areas of bank management and is necessary for formulation and achievement delivered goals. Except general regularities, inherent management processes, anti-crisis management is based on specific features related with implementation anti-crisis procedures [296].

Anti-crisis management represents a complex management system, which aimed at prediction danger crises, analysis and elimination threats appearance crisis situations . In the event of a crisis, anti-crisis management involves diagnosing the impact of crisis-causing factors on a banking institution and taking effective measures to minimize costs and negative consequences.

In the most general form, anti-crisis management should be considered management that will mitigate crisis situations in the bank's financial activity or prevent their occurrence.

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According to this interpretation, anti-crisis management is proposed to be differentiated into the following subspecies [278]:

- 1) pre-crisis management, which serves for timely identification and resolution of problems (decision-making) in order to prevent a crisis;
- 2) management in crisis conditions, which ensures the stabilization of an unstable state and preservation of system controllability;
- 3) management of the processes of exiting the crisis, which is carried out to minimize losses and lost opportunities during the withdrawal of the enterprise from the crisis state.

Anti-crisis management is understood as a complex of measures at the stages of identifying crisis-causing factors, timely diagnosis, prevention and neutralization of the crisis, aimed at achieving the goals of the bank's activities, implementing its strategy and further development [296].

The introduction of anti-crisis management aims to implement the following measures [296; 355]:

- diagnosis of processes and trends leading to crisis situations;
- forecasting the occurrence, development and likely consequences of crisis situations;
- implementation of anti-crisis support (identification of processes and trends that lead or may lead to crisis situations);
- conducting advance preparation in case of emergency situations (anti-crisis prevention);
- organization and coordination of effective actions to overcome emergency crisis situations and their consequences.

In the process of realizing its main goal, anti-crisis management of the bank is aimed at solving the following main tasks of preventing the probability of bankruptcy [316]:

1. Timely diagnosis of the pre-crisis state of the bank and the use of necessary preventive measures to prevent the crisis. This task is implemented by constantly monitoring the bank's financial condition and factors of the external financial environment that have the most significant impact on the results of operations.

Diagnosis of the pre-crisis state of the bank based on the results of such monitoring in many cases allows to avoid the crisis due to the implementation of preventive protective measures or, at the very least, to significantly mitigate the nature of its subsequent course. Taking preventive measures to prevent a bank crisis is the most economical direction of anti-crisis management, which provides the greatest effect (in the form of reducing future losses) per unit of financial resources spent for these purposes.

2. Elimination of bank insolvency. This task is the most urgent in the system of tasks of anti-crisis management of the bank when diagnosing any form of its crisis.

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In a number of cases, the implementation of only this task makes it possible to stop the deepening of the bank's crisis, restore its image among business partners and obtain the necessary reserve of time for the implementation of other anti-crisis measures.

3. Restoring the bank's financial stability. This is one of the main tasks of realizing the main goal of anti-crisis management provided by the bank, which requires the greatest efforts and expenditure of financial resources.

The implementation of this task is carried out through a step-by-step structural restructuring of the entire financial activity of the bank.

In the process of such financial restructuring of the bank, first of all, optimization of the capital structure, current assets and cash flows should be ensured, and in some cases, its investment activity should be reduced.

4. Prevention of bankruptcy and liquidation of the bank. Such a task faces the bank's anti-crisis management when diagnosing a deep or catastrophic systemic crisis.

As a rule, the internal mechanisms of financial stabilization and the volume of the bank's own resources are insufficient to overcome such a crisis.

Therefore, in order to prevent bankruptcy and liquidation of the bank in the process of anti-crisis management, it should be ensured its effective external rehabilitation (with the development of an appropriate investment rehabilitation project).

5. Minimizing the negative consequences of the bank crisis. This task is implemented by consolidating the positive results of bringing the bank out of the financial crisis and stabilizing the qualitative structural transformations of its financial activities, taking into account its long-term perspective. The effectiveness of anti-crisis management of the enterprise's financial security directly depends on:

- the quality of training of personnel who must make informed decisions in conditions of not always complete information, be ready to act in non-standard conditions, be prepared and possess the necessary knowledge;
- the clarity of the functioning of the monitoring system, which would provide complete information about the current level, dynamics and possible changes in the level of financial security;
- the existence and actions of the preventive management system, which would allow timely detection of signals about the formation of internal and external factors and processes capable of causing the emergence and development of threats and risks, predicting their occurrence and possible consequences.

Efficiency anti-crisis management is defined degree achievement goals softening, neutralization or positive use crisis in comparison with the resources

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spent on it [331]. The main goal of anti-crisis management consider software stable functioning and development of the bank.

Functioning domestic banks in modern conditions characterized by the presence of such negative ones trends:

- insufficient level capitalization banks to the level international standards;
- insolvency banks perform own obligations;
- structural imbalances between the demand and supply for loans resource banks;
- deterioration credit portfolio quality;
- growth equal mistrust population to banking institutions.

Factors that contribute to the development of the crisis, as a rule, do not arise unexpectedly, that is why the crisis is developing continuously a certain time. The emergence of a crisis is very often preceded by some reasons, which lead to the emergence of problems in these sectors of activity in banking institutions:

- low qualification employees of the bank and its managers;
- imperfect internal control structure;
- ineffective risk management system of the bank;
- non-compliance with norms and standards banking activity;
- reduction values own capital;
- negative changes in the structure resource bases;
- decrease income during growth receivables and payables debts;
- decrease quality assets and violations their structures;
- permanent attraction of funds from the interbank market in significant volumes;
- decrease equal diversification assets and liabilities;
- insufficient level of formed reserves under accepted risks;
- imperfection technical base, which is responsible for providing carrying out banking operations;
- ineffective work of the bank's security service.

A feature of anti-crisis management as an important component of the bank's overall management system is its cyclicity. Process anti-crisis management has to be repeated until the moment when the bank will not come out of the crisis. Mainly new ones stages anti-crisis bank management, which are constantly repeated are the following:

- organization implementation adopted decisions;
- performance control adopted decisions;
- adjustment measures with anti-crisis management;
- reorganization and implementation adopted decisions.

Thus, the process of anti-crisis management is constantly repeated, therefore it is a component of the strategic management of the bank. The bank's strategic management system is aimed at the bank's competitive existence in the long term.

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Strategic management includes defining the goals and strategies of the bank, developing and ensuring the implementation of a system of plans, improving the functioning of the bank as a whole and its individual functions and operations.

Strategy anti-crisis bank management is mean the bank's achievement of its goal aimed at solving a contradiction in his development in the condition manifestation crisis or her threats under influence crisis-inducing factors, based on limited resources [422]. Thus, the system of strategic management by the bank is closely related to its anti-crisis system management, where the latter is difficult, but necessary regulatory process which allows bank to remain financially stable and profitable.

The process of crisis management in a bank is designed to handle controlled crises and anticipate uncontrolled crises. Controlled crises are processes that can be altered under certain influences. The managed process of overcoming or preventing a crisis, aligned with the bank's objectives and reflective of its developmental trends, characterizes the process of crisis management [265].

Uncontrolled crises are process whose direction and nature cannot be altered as a result of managerial influence. The course of uncontrolled crises follows its own laws and leads to irreversible consequences.

It should be noted that the process of anti-crisis management should be considered both at the macro and micro levels. At the macro level, measures aimed at timely identification and resolution of problems related to crisis prevention are applied, state management tools are used to eliminate the consequences of financial crises in the banking system, and anti-crisis strategic priorities for the development of the banking sector of the economy are determined.

At the macro level, the process of anti-crisis management of a banking institution involves dividing it into the following main stages:

1. Crisis containment. At this stage, after identifying the systemic signs of the crisis, the state authorities must take immediate measures aimed at preventing the spread of the crisis to the entire system. Therefore, one of the first and priority tasks for the bank is to retain customers and maintain the level of deposits by restoring their trust in the bank and the banking sector as a whole. On the part of the state, it would be appropriate to use such methods as the expansion of the bank deposit guarantee scheme, the provision of liquidity support for banks, including under less strict conditions than under normal circumstances, as well as the structural instrument of immediate liquidation of completely insolvent banks.

2. Systemic restructuring of banks. This stage is aimed at restoring the solvency and profitability of banks, their performance as financial intermediaries. At this stage, a detailed analysis of bank assets is carried out in order to determine their current state. After that, banks are divided into separate categories: from insolvent to financially stable.

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3. Working with problem loans. It is conducted to maximize the value of "bad" assets and minimize bank losses. Such assets can be managed by: independent restructuring by the bank or writing off their value from the balance sheet; transfer or resale of loans to a private company or sale to a centralized asset management company, which is usually a public institution.

Therefore, at the level of state regulation of the emergence of crises, specific methods of banking anti-crisis management are used, which are aimed at streamlining and updating the regulatory framework, financial recovery of banks, introduction of temporary administration, financial recovery, restructuring and liquidation of problem banks, revision of the NBU's monetary policy, etc.

Anti-crisis management of a banking institution in the microeconomic aspect presupposes, first of all, the achievement of financial stability of a separate banking institution, which is implemented through the prism of the following tasks: prevention of crisis phenomena; withdrawal of the bank from the crisis situation, if it was not possible to avoid it; restoration of the bank's operation at the pre-crisis level.

Conventionally, the anti-crisis management of the bank can be divided into the following stages:

1. Determination of the goals, objectives, tasks of anti-crisis management of the bank.
2. Detection of early signs of crisis and identification of the bank's financial condition.
3. Implementation of preventive anti-crisis measures, financial stabilization, rehabilitation measures (if necessary).

It should be noted that in the process of anti-crisis management at the micro level, the bank must implement the following measures:

- diagnosis of processes and trends leading to crisis situations;
- forecasting the occurrence, development and likely consequences of crisis situations;
- implementation of anti-crisis support (identification of processes and trends that lead or may lead to crisis situations);
- conducting advance preparation in case of emergency situations (anti-crisis prevention);
- organization and coordination of effective actions to overcome emergency crisis situations and their consequences.

Thus, the stages of anti-crisis management both at the macro and micro levels are important and in most cases interrelated, but the guarantee of their effectiveness is the high-quality management of the bank, because no matter how difficult the macroeconomic situation is, the reason for the inefficient operation of the bank is primarily all unqualified management. It is in the period of crisis that the question of matching positions and the qualifications of the people who occupy them acquires special importance. Therefore, effective anti-crisis management is necessary for any

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banking institution in crisis conditions, which is the key to effective bank operation. Also, the main issue in the study of banking crises is the analysis of their impact on the banking system as a whole. The economic consequences for the country depend on the number of banks affected by crisis phenomena.

Therefore, the stages of anti-crisis management of the bank are a complex system of purposeful influence on the financial system of the bank, its resources and financial relations, which allows to maintain the constant viability of the bank and prevent its bankruptcy under the influence of crisis-causing factors.

Anti-crisis management of the bank is based on the detection of early signs of crisis and identification of the bank's financial condition, normal, pre-crisis, crisis. The result of identifying the bank's financial condition is quite important, as it provides not only a generalized assessment of the bank's current condition, but also determines management decisions in planning, organization and motivation.

The scheme of anti-crisis management of systemic banks should have the following properties:

- mobility and dynamic use of resources, implementation of changes, implementation of innovative programs;
- implementation of program-targeted approaches in development and decision-making technologies;
- taking into account the time factor in the processes of anti-crisis management;
- increased attention to the processes of developing management decisions and choosing alternatives for carrying out activities;
- the use of quality criteria in the development and implementation of anti-crisis solutions.

Thus, for the effective functioning of the bank's anti-crisis management scheme, the implementation of the following principles is necessary [287]:

- functionality – separation of functions between divisions and branches of banks that develop an anti-crisis strategy, make management decisions, ensure their implementation and carry out control and regulation;
- manageability – minimization of levels of subordination and optimization of objects subject to anti-crisis management;
- centralization of the performance of the main functions - ensuring that the anti-crisis management units perform tasks in accordance with the defined mission, general goal and main tasks of the functioning of system banks;
- minimization (optimization) of costs – justification of costs for anti-crisis measures depending on the decisions made;
- comprehensiveness – holistic coverage of problems, interaction of divisions and coordination of all stages of diagnostics and monitoring of the bank's activity;

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- delegation of powers and responsibilities – transfer of powers (decision-making rights) and acceptance of responsibilities to heads of departments depending on the problematic nature of the bank's development;
- rationalization of information flows – transparency in information flows regarding the situation in the banking institution.

Effectiveness of implementation procedures anti-crisis management in the bank is essential depends from acting organizational the structure of the bank, certain rules and procedures of provision systems prevention and countermeasures crisis in the bank.

The system of managing the anti-crisis activity of banks in the conditions of dynamic changes in the external environment is based on general properties inherent in management activities, but taking into account specific features. Its main task is the timely detection of signs of the onset of the crisis and its causes, as well as the ability to adjust the bank's development without losing control and reducing growth rates [198].

In order to effectively perform the tasks of anti-crisis management, certain management functions are performed. Most of the authors who devoted their works to the study of this problem distinguish the functions of planning, organization, control, motivation, accounting, monitoring, diagnosis.

We believe that one of the most important functions of anti-crisis management of a banking institution is precisely the function of forecasting. It allows predicting the state, structure, dynamics and prospects of management phenomena and processes inherent in the object of anti-crisis management of financial stability. The planning function is implemented through the process of forming goals, determining priorities, means and methods of achieving them, and developing anti-crisis measures, which should be used to achieve the goal. The organizational function is associated with the formation of a body that carries out anti-crisis management, establishing its tasks, functions and powers. The motivation function is provided by the use of motivational regulators of the subjects of the anti-crisis process of the owners and staff of the bank that found itself in a crisis state. The performance of the accounting function involves the collection, transfer, storage and processing of data, registration and grouping of information on the operation and effectiveness of the bank's anti-crisis management system. Monitoring as a function of the bank's anti-crisis management is a continuous process of information gathering, summarization, analysis of the obtained results, study of the reasons that led to them and the trends that appear at the same time, as well as the development of appropriate measures. The diagnostic function is implemented by forming a system of main indicators of the threat of a bank's financial crisis, performing diagnostics of such indicators, identifying the main factors of the external and internal environment of the bank's functioning that

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generate threats to its financial interests, comprehensive assessment of the scale of the bank's crisis financial development [355].

All the above-mentioned functions of the bank's anti-crisis management must be implemented on the basis of the implementation of a number of principles, namely: continuity of anti-crisis and preventive actions, cyclical goal formation, control over the implementation and evaluation of the effectiveness of management decisions regarding the bank's anti-crisis management, consistency of various types and levels of management decisions of the anti-crisis management in space and time, systematicity, proportionality of the governing bodies of the anti-crisis management subsystem of the bank by scope of powers and technical and technological equipment.

The bank's anti-crisis management organization system synthesizes all types of anti-crisis management activities and is an integral part of the bank's risk management and financial stability management system. In the applied aspect, anti-crisis organizational activity is aimed at ordering, coordinating, combining in space and time all components of anti-crisis management. Therefore, the essence of the organizational support of anti-crisis management of the bank can be formulated as a set of processes and actions that include methods, forms, tools for organizing actions to minimize the impact of crisis-causing factors on the bank's activities, including on its financial, material, information and personnel resources.

The anti-crisis management system, as well as the risk management system in the bank, consists of the following regulatory documents: policies, provisions, procedures, methods, which are approved in accordance with the form of corporate governance chosen by the bank, taking into account the size of the bank and the complexity of its operations [358]. The structure of the organization of anti-crisis management depends on the degree of influence of threats from the external and internal environment. Also, its construction is influenced by the structure of the bank's risk management system, which consists of credit risk management subsystems, liquidity risk, currency risk, interest rate risk, market risk, operational and technological risk, reputation risk, strategic risk, and legal risk.

The process of anti-crisis management covers the entire activity of the bank and is closely related to strategic management. This process is carried out by the supervisory board, managers and all other employees, in order to carry out the development of measures that will allow to bring the identified risk in line with its acceptable level.

It should be noted that anti-crisis management is carried out in banks by the same departments and committees that perform functions management risks in the bank. According to the law, every bank can independently create constantly acting division of issues analysis and management risks. Mandatory for banks Ukraine

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is a creation special constantly active committees: the credit committee and the committee on issues asset and liability management.

The important role of development and selection basic directions anti-crisis the bank's management has an internal audit service that is responsible for the reduction risks in implementation banking operations related to rational and effective using bank resources, verification results current financial activity, conducting an activity audit structural bank divisions.

So, to the process anti-crisis bank management are involved such subdivisions (organs):

- Assets and Liabilities Management Committee;
- credit committee;
- department management problematic assets;
- bank's risk management division;
- bank security division;
- internal audit service;
- management department credit risks, etc.

Also created in bank institutions special departments and committees which cooperate with financial services monitoring, internal audit and other departments. Among them is necessary allocate a forecasting department activities of the bank, which implements management functions of the bank for the purpose of implementation basic principles him activity: liquidity, profitability, reliability. Also for accumulation and analysis statistical information about the bank's activities and its customers, conducting various of research, create a department of analysis and statistics [296].

In addition to the above organizational structural subdivisions, in the conditions of relentless digitalization of financial processes, which involves the transfer of operations, communications, functions and processes to the digital plane, it is important to perform functions to ensure the stable functioning of the bank and prevent threats to its information security. In part, such tasks can be performed by existing divisions of the bank, however, in our opinion, it is appropriate to create a separate department for information security management.

To the main ones tasks division informative security of the bank should include:

- protection informative assets and collateral continuity bank activities;
- prevention of leakage and destruction of confidential banking information;
- protection against illegal encroachments, disclosure, loss, leakage, distortion and destruction of official information, disruption of technical means;
- protection of normal operating conditions of the information infrastructure to ensure the information security of the bank's owners, employees and customers.

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In our opinion, in the structure anti-crisis management of the bank is expedient to create constantly of the active management center risks of the bank, to the composition whose except of the above committees and divisions have enter: department of strategic risks, corporate business risk department, credit department of risks, risk control department. The main ones functions of the management center the bank's risks are cooperation and coordination activity everyone divisions of the bank during implementation anti-crisis bank management.

Therefore, the author's analysis of the theoretical and practical aspects of anti-crisis management made it possible to conclude that it is inherently strategic and must be built on well-founded strategies, then the process of implementing anti-crisis management strategies, as well as the bank's development strategy, should take place at different levels of its organizational structures - the level of the bank as a whole, the level of divisions and the functional-operational level, which allows us to distinguish three types of anti-crisis management strategies - corporate, business and functional.

In the majority of domestic banks, as a rule, there is no agreement in the actions of the management, there are no clear concepts and a clearly formulated strategic vision of the bank's development in the conditions of the crisis [278]. In connection with this increase efficiency anti-crisis bank management requires development of the theoretical basis of formation and selection strategies in the system anti-crisis management. Considering this, in the long run strategy development of the bank is necessary to make corrections according to the changes external environment and features functioning of the bank in it. In another in this case, the bank can a crisis will arise as a result critical inconsistencies functioning and external conditions.

One of the most important tasks of the subject of anti-crisis management is the assessment of the effectiveness of actions related to the formation and implementation of its anti-crisis strategy [341]. The construction of a qualitative system for evaluating the effectiveness of anti-crisis management of the bank is the basis for improving the mechanism of making managerial decisions that affect both the current effectiveness of the bank and the formation of measures to prevent future crises.

In our opinion, the evaluation of the effectiveness of the anti-crisis management of the bank should be done comprehensively on the basis of the most significant local characteristics of the evaluation of the effectiveness of the anti-crisis actions by indicators of financial stability, business activity, liquidity, management efficiency, as well as indicators, the negative value of which may threaten the existence of the bank. Such indicators should make it possible to use them for a comprehensive analysis and assessment of the effectiveness of anti-crisis management, as well as to identify directions for improving the bank's anti-crisis strategy.

The study determined the specifics of the bank's anti-crisis management organization. Attention is focused on problematic sectors of banking institutions due

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to the impact of negative factors on the banking system of Ukraine. The process of anti-crisis management of the bank at the macro and micro levels is delimited and its stages are analyzed. It was determined that the bank's anti-crisis management organization system synthesizes all types of anti-crisis management activities and is an integral part of the bank's risk management and financial stability management system. Since the anti-crisis management of the bank is strategic in its essence, it should be built on sound strategies, and the process of implementing anti-crisis management strategies, as well as the bank's development strategy, should take place at different levels of its organizational structure, the level of subdivisions and the functional-operational level.

Organizational support of the bank's anti-crisis management is a set of processes and actions, including methods, forms, tools for streamlining actions to minimize the impact of crisis-causing factors on the bank's activities, including on its financial, material, information and personnel resources.

Effectiveness of implementation procedures anti-crisis management in the bank is essential depends from acting organizational structure of the bank . Based on the analysis of the work of the structural units that participate in the anti-crisis management process, it is proposed to organize the functions of the anti-crisis management of the bank by separating its individual structural units, in particular, the permanently operating center for the bank's risk management.

The anti-crisis management system has properties that provide a special management mechanism: flexibility and adaptability, the ability to diversify and timely situational response, as well as the ability to effectively use the potential of the banking institution and informal management methods [331].

According to domestic economist, in particular V. V. Kovalenko [162], sustainability is the most fundamental concept, which most of all reflects the problems and trends of the development of the banking sector. In order to solve the problem of stabilization of banks' activities, it is necessary to formulate strategies individually for each individual bank.

The process of advancing banks towards possible bankruptcy or towards perfection is accompanied by the use of resources. Determining the limit states for banks is important, as it makes it possible to identify problem orientations [341].

Despite the use of a limited number of analytical indicators that can be used to analyze the bank's public and confidential financial statements, such an analysis serves as an effective tool for assessing the financial condition and makes it possible to recognize the nature and significance of changes in advance and predict their likely development.

Therefore, in modern conditions, the issue of bank security is extremely relevant. Macroeconomic instability and, as a result, the increasing dynamism and

2.3. Approaches to minimizing risks in the bank's anti-crisis management system

influence of external factors, in particular, the political situation, an increase in the level of crime in the banking sector, unfair competition, and a low level of public trust in banks, complicate the process of banks' functioning, which affects the results of their activities.

That is why the bank faces the task of assessing the management of its resistance to risks, building a system of indicators of the effectiveness of the bank's security management, substantiating and establishing the limit values of indicators, using measures to counter threats.

There are several main groups of indicators that allow assessing the risk tolerance of a banking institution.

A comprehensive assessment of a bank's financial stability is an important tool for conducting an in-depth analysis of its financial condition and ability to withstand various economic stresses and negative influences. This process usually includes analysis of financial statements, indicators, trends and other factors that determine the financial health of the bank.

The main tasks of a comprehensive assessment of the bank's financial and economic stability include the following aspects [214; 287]:

- financial stability risk assessment, which helps identify possible risks, including insufficient capitalization, high debt, poor asset quality, etc. This makes it possible to avoid potential problems and prepare plans for their elimination;
- development strategy planning, as information on financial sustainability helps to develop effective strategies for development and attracting resources. Therefore, the bank can timely determine its opportunities for growth and building long-term plans;
- attracting investors. Investors assess financial stability before investing their funds in a bank. Such an assessment affects investment decisions and the cost of capital;
- increase in the trust of the bank's customers. Financial stability is an important factor for customers who prefer stable and reliable banks to carry out their financial transactions;
- fulfillment of requirements for regulation and supervision by the NBU, as banks must maintain an appropriate level of capital, liquidity, credit and investment risks.

Thus, a comprehensive assessment of the financial and economic stability of the bank helps to respond to potential problems in a timely manner, plan strategic steps and provides the basis for the sustainable and efficient functioning of the financial institution.

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A comprehensive assessment of a bank's financial and economic stability is an important tool for making an adequate and objective assessment of its ability to withstand economic and financial turbulence, ensuring the stability and reliability of the banking system as a whole. The assessment of financial stability includes the analysis of various financial, operational and managerial aspects of the bank and provides an understanding of its capabilities.

In general, a comprehensive assessment of a bank's financial and economic stability is a key tool for ensuring its stability, trust and ability to function effectively even in the event of negative economic or financial events.

A comprehensive assessment of a bank's financial and economic stability is an extremely important aspect for understanding its ability to withstand economic and financial challenges while maintaining stability and reliability in functioning. This one rating includes analysis various aspects the bank's financial condition and ability cope with the possible stressful situations [334].

For a comprehensive assessment of the financial and economic stability of the bank, it is important to take into account both tactical and strategic priorities of the development of the banking institution.

Tactical level: provides an assessment of the current level of financial and economic security of a banking institution. The coefficients calculated at the first stage show how independent the organization is from creditors.

Strategic level: provides an assessment of the bank's strategic level of resistance to risks by calculating the integral indicator of the assessment of the bank's financial and economic stability. Each of the components of the integral indicator is evaluated, taking into account the importance and influence of the indicators on the final result.

The most important partial indicators that make it possible to comprehensively evaluate the financial and economic stability of the bank from the point of view of capital and resource security, liquidity, business activity and profitability of the institution under the conditions of obtaining a safe level of income and expenses of the bank (Table 2.7).

Table 2.7. Partial indicators of the assessment of the level of financial and economic stability of the bank

Indicator	Economic content
Indicators of capital and resource sustainability of the bank	
Reliability coefficient	Shows how much actually paid-in authorized capital is per UAH 1 of assets
Equity concentration ratio	It characterizes the share of the owners of the enterprise in the total amount of funds advanced for its activities
Capital multiplier factor	Reflects the degree of coverage of assets by equity capital

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End of table 2.7

Indicators of bank liquidity	
Instant liquidity ratio	Shows the ability of the bank to repay «live» money from the checking accounts and cash register obligations for all deposits
Coefficient of total liquidity of the bank's liabilities	It characterizes the bank's maximum ability to repay liabilities with all assets
Indicators of the level of business activity and profitability of the bank	
Bank efficiency ratio	Shows how efficient the bank is (profitable or unprofitable)
Rate of return on assets	The level of payback by the net profit of the average annual assets as a whole
Return on equity ratio	It characterizes the efficiency of the use of own capital

Source: formed by the author.

In order to generalize into a single system of measurement and assessment of disparate partial indicators given in the Table 2.6, we will build an integral taxonomic indicator of assessing the financial and economic stability of the bank according to the following model:

$$Y = X_1; X_2; X_3; X_4; X_5; X_6; X_7; X_8 \quad (2.1)$$

where Y – is an integral taxonomic indicator of assessing the financial and economic stability of the bank;

$X_1 - X_8$ – partial indicators of assessment of financial and economic stability of the bank (Table 2.7).

The initial data for evaluating security management are 8 indicators of JSC “AB “RADABANK”, which characterize the state of the bank's risk management over three years. The basis for their calculation is the data of the bank's official financial statements. The calculated indicators, which are presented in the Table 2.8 made it possible to obtain a generalized picture of the changes that occurred in the set of signs of financial stability management of JSC “AB “RADABANK” in dynamics.

Table 2.8. Initial data for the calculation of the integral taxonomic indicator of the assessment of the financial and economic stability of JSC “AB “RADABANK”

Indicator	Conventional designation	2019	2020	2021
Indicators of capital and resource sustainability of the bank				
Reliability coefficient	X_1	0.20	0.13	0.09
Equity concentration ratio	X_2	0.17	0.12	0.08
Capital multiplier factor	X_3	10.49	16.03	18.08

2.3. Approaches to minimizing risks in the bank's anti-crisis management system

End of table 2.7

Indicators of bank liquidity				
Instant liquidity ratio	X_4	0.19	0.18	0.16
Coefficient of total liquidity of the bank's liabilities	X_5	1.35	1.26	1.15
Indicators of the level of business activity and profitability of the bank				
Bank efficiency ratio	X_6	0.78	0.89	0.68
Rate of return on assets	X_7	1.96	0.86	1.91
Return on equity ratio	X_8	0.13	0.08	0.24

Source: formed by the author.

We will standardize matrix elements according to formula 2.2:

$$P_i = \frac{X_i}{X_{ij}}, \quad (2.2)$$

where P_i – is the standardized indicator of the integrated taxonomic assessment of financial and economic stability according to the i th partial indicator;

X_i – a partial indicator of the assessment of the bank's financial and economic stability;

X_{ij} – the average value for the group of partial indicators of the assessment of the financial and economic stability of the bank.

The standardized system of partial indicators is presented in the Table. 2.9.

Table 2.9. Standardized system of indicators

Indicator	Conventional designation	2020	2021	2022
Indicators of capital and resource sustainability of the bank				
Reliability coefficient	P_1	1.41	0.94	0.65
Equity concentration ratio	P_2	1.36	0.96	0.68
Capital multiplier factor	P_3	0.71	1.08	1.22
Indicators of bank liquidity				
Instant liquidity ratio	P_4	1.10	1.01	0.89
Coefficient of total liquidity of the bank's liabilities	P_5	1.08	1.00	0.92
Indicators of the level of business activity and profitability of the bank				
Bank efficiency ratio	P_6	1.00	1.13	0.87
Rate of return on assets	P_7	1.24	0.55	1.21
Return on equity ratio	P_8	0.87	0.54	1.59

Source: formed by the author.

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The calculation of the integral taxonomic indicator of the assessment of the financial and economic stability of JSC "AB "RADABANK" after determining the elements of the matrix of observations and their standardization involves the differentiation of features. This procedure involves dividing all variables into stimulators and destimulators. The basis of this division is the characteristic influence of each of the indicators on the level of development of the object under study. Signs that have a positive effect (stimulation) on the general level of development of the object are called stimulators, signs that slow down the bank's development are destimulators. The division of the sign into stimulators and destimulators is the basis for building the standard vector.

Accordingly, to the direction of influence of partial characteristics on the generalizing indicator, all indicators are stimulants.

So, for JSC "AB "RADABANK", the reference vector has the following coordinates:

$$P = 1.41; 1.36; 1.22; 1.10; 1.08; 0.87; 1.24; 1.59. \quad (2.3)$$

The next stage of determining the integral taxonomic indicator for assessing the financial and economic stability of the bank is to determine the distance between individual observations (periods) and the reference vector.

The distance between the unit point and the P_i point is calculated by formula 2.4.

$$C_{0i} = \sum_{j=1}^m (p_{ij} - p_{0j})^2, \quad (2.4)$$

where p_{ij} – is the standardized value of the j th indicator in time period i ;
 p_{0i} – the standardized value of the i -th indicator in the standard.

The calculated values C_{0i} in 2020-2022 for JSC "AB "RADABANK" are $C_{0i2020} = 0.37$; $C_{0i2021} = 0.53$; $C_{0i2022} = 0.48$.

The calculation of the integral taxonomic index of the integral taxonomic index of the assessment of financial and economic stability was carried out according to formula 2.5.

$$Y_i = 1 - C_{0i}. \quad (2.5)$$

The value of the integral taxonomic indicator of the assessment of the financial and economic stability of JSC "AB "RADABANK" for 2020-2022 is given in the Table. 2.10.

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Table 2.10. The value of the integral taxonomic indicator of the assessment of the financial and economic stability of JSC “AB “RADABANK” for 2020-2022

A integral taxonomic indicator of the assessment of the financial and economic stability	Value
Y_{2019}	0.63
Y_{2020}	0.47
Y_{2021}	0.52

Source: formed by the author.

A graphic representation of the integral taxonomic indicator of the assessment of security management of JSC “AB “RADABANK” is presented in Fig. 2.11.

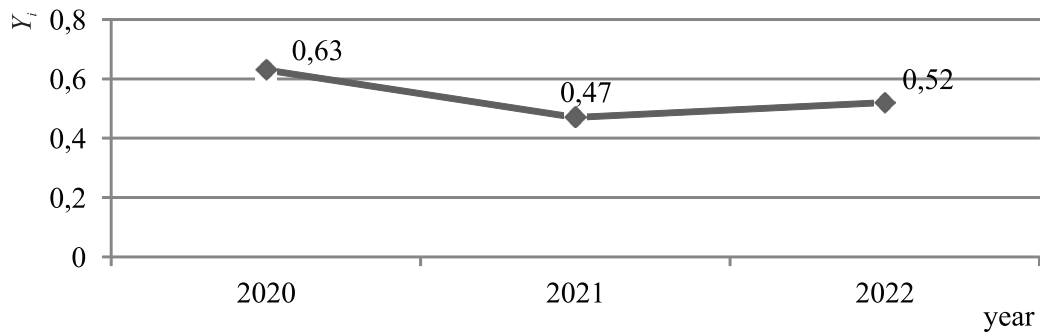


Figure 2.11. The dynamics of the integral taxonomic indicator of assessing the financial and economic stability of JSC “AB “RADABANK” in 2020–2022

Source: formed by the author.

As can be seen from the Table 2.9, the indicator takes high values when the values of the partial indicators are close to the standard and low values when they are far away. Table data 2.9 indicate that the trends of changes in indicators that make it possible to assess the financial and economic stability of the bank from the point of view of financial stability, business activity, liquidity and management efficiency correspond to the dynamics of changes in the integral taxonomic indicator of security management assessment of JSC “AB “RADABANK” over the past three years . In 2021, the bank received the lowest value of the general indicator, but already in 2022, a certain improvement in the level of partial and, accordingly, integral indicators of the assessment of economic and financial stability was observed. Significant factors that had an impact on the effectiveness of JSC “AB “RADABANK” actions during this period were the increase in its authorized capital, as well as the potential growth of its opportunities to attract resources on the financial market.

The proposed integral taxonomic index for assessing the financial and economic stability of the bank is a quantitative universal indicator for measuring the signs of the level

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of effectiveness of the bank's anti-crisis management and resistance to potential risks, which proves the possibility of its application for a comprehensive analysis and assessment of the effectiveness of the bank's security management, as well as the identification of directions for improving the anti-crisis management of the bank institutions

Thus, in the study, the specifics of the organization of anti-crisis management of the bank-com are determined. Attention is focused on problematic sectors of banking institutions due to the impact of negative factors on the banking system of Ukraine. The process of anti-crisis management of the bank is divided into macro and micro levels and its stages are analyzed. It was determined that the bank's anti-crisis management organization system synthesizes all types of anti-crisis management activities and is an integral part of the risk management system and management of the bank's financial stability. Since the anti-crisis management of the bank is strategic in its essence, it should be built on sound strategies, and the process of implementing anti-crisis management strategies, as well as the bank's development strategy, should take place at different levels of its organizational structure, the level of subdivisions and the functional-operational level.

Organizational support for anti-crisis management of the bank is a set of processes and actions, including methods, forms, tools for streamlining actions to minimize the impact of crisis-causing factors on the bank's activities, including on its financial, material, information and personnel resources.

It was concluded that the effectiveness of anti-crisis management procedures in the bank depends significantly on the current organizational structure of the bank. Based on the analysis of the work of the structural units that participate in the anti-crisis management process, it is proposed to organize the functions of the anti-crisis management of the bank by separating its individual structural units, in particular, the permanently operating center for the bank's risk management.

Thus, the proposed directions for improving the organization and evaluating the bank's anti-crisis management system will allow developing new approaches to optimizing the organizational structure of the bank's anti-crisis management. Improving the organizational structure of the bank's anti-crisis management will contribute to a better organization of the work of the staff, which depends on the performance of tasks and the achievement of goals in the process of carrying out anti-crisis actions of the banking institution.

Proposed integral taxonomic indicator allows to measure financial and economic stability of the bank with the help of quantitative universal indicator. This indicator reflects efficiency anti-crisis management of the bank and its ability endure potential risks. It indicates a possibility using this indicator for comprehensive analysis and assessment efficiency management bank security, as well as for detection ways improvement anti-crisis management bank institution.

PART 3.
STRATEGY FOR THE REVIVAL OF UKRAINE'S ECONOMY
IN THE POST-WAR PERIOD

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

Ukraine is now on the edge of a new history and building a free state. Its further development should be focused on the development of its territories and ensuring a decent and safe standard of living for the citizens of each region and territorial community.

The development of territories and ensuring a decent life for all citizens is an important task. This includes reforms in various areas such as the economy, education, healthcare, infrastructure and many others to ensure the sustainability and development of Ukraine and its regions.

It is also key to build a strong democracy, fight corruption, increase transparency and openness of the government, and support civic participation. This will help to ensure equal opportunities and improve the quality of life for all citizens of Ukraine and each of its regions.

The renewal of Ukraine and its regions is an important goal, especially in the face of geopolitical challenges and reforms. The main directions of renewal include (Table 3.1) `8; 27; 40]:

Table 3.1. The main directions of renewal of Ukraine and its regions

No.	Directions of renewal of Ukraine	Key aspect
1	2	3
1	Peace and Stability	<ul style="list-style-type: none"> – Resolution of conflicts and restoration of territorial integrity – Strengthening defense capabilities and national security – Support for diplomatic efforts to achieve peace
2	Economic Development	<ul style="list-style-type: none"> – Attracting foreign investments to stimulate economic growth – Improving the business environment by reducing bureaucracy and corruption – Diversifying the economy to reduce dependency on a few sectors – Supporting small and medium-sized enterprises (SMEs) for job creation
3	Infrastructure and Social Services	<ul style="list-style-type: none"> – Modernization of infrastructure, including transportation, energy, and communications – Ensuring access to quality education, healthcare, and social services – Implementation of digital technologies and the internet

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

End of table 3.1

1	2	3
4	Regional Development	<ul style="list-style-type: none"> – Reducing regional disparities through investments and development initiatives – Supporting local initiatives and entrepreneurship – Regional cooperation for shared development – Fiscal decentralization for the development of financial self-sufficiency of regions and territorial communities
5	Governance, Reforms, Anti-Corruption	<ul style="list-style-type: none"> – Strengthening the rule of law and judicial independence – Implementing anti-corruption measures and ensuring transparency in government operations – Decentralization of power to empower local governments and communities
6	International Cooperation	<ul style="list-style-type: none"> – Collaboration with international partners and organizations to provide support and reforms. – Pursuing diplomatic and peacekeeping solutions to conflicts
7	Civil Society	<ul style="list-style-type: none"> – Encouraging active citizen participation in decision-making and oversight of government activities – Strengthening civil society organizations and the role of civil leaders
8	Education and Workforce Development	<ul style="list-style-type: none"> – Reforming the education system to meet the needs of a modern economy – Fostering skills development and vocational training – Encouraging research and development activities

The renewal of Ukraine and its regions requires comprehensive approaches, cooperation from all sectors of society, investments, and reforms to ensure sustainable development and improve the quality of life for all citizens.

In the context of martial law, the tasks set by the reform of decentralization and improvement of the territorial organization of power in Ukraine for local governments to ensure the socio-economic development of communities and territories are becoming more relevant.

In particular, local governments are primarily responsible for the development of social institutions in territorial communities, primarily in providing educational, medical and other services to both permanent residents and internally displaced persons; for organizing humanitarian assistance and temporary shelter for internally displaced persons; ensuring compensation to families hosting internally displaced persons, etc. This strengthens the requirements for the introduction of effective management mechanisms, non-standard technologies of managerial influence, new communication tools of interaction in the functional activities of local governments in the field of ensuring the organizational and resource capacity of territorial communities to meet the needs of the Armed Forces of Ukraine, local economic development, and life support of territorial communities in the face of challenges and threats of martial law [333].

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

Among the main problems faced by territorial communities during the war and that will need to be addressed after the war are: the suspension of operations of enterprises in the temporarily occupied territories or those in the combat zones; restrictions on capital investment; reduced revenues to local budgets and an increased need for financial resources to provide social support to residents of the territorial community and internally displaced persons; a threatening increase in unemployment; loss of human and, above all, intellectual potential in the [333].

Fiscal decentralization plays an important role in building the financial capacity of territorial communities, especially in the postwar period. The main aspects of this role include the following.

Firstly, it is the distribution of budgetary resources. Fiscal decentralization allows for the redistribution of budgetary resources between central and local governments. This can help to support regional and local initiatives and economic recovery at the level of territorial communities.

Secondly, fiscal decentralization promotes economic development of the territories. Fiscal decentralization allows local authorities to invest more effectively in infrastructure, education, healthcare, and other areas, which helps to improve the economic level of the territories.

Third, fiscal decentralization promotes greater accountability. Decentralization can increase the responsibility of local authorities for managing budgetary resources and the quality of public services. This helps to increase the efficiency and effectiveness of the use of budget funds.

Fourth, fiscal decentralization helps to attract investment, which is very important in the recovery of territories after war. Fiscal decentralization can attract investors to the local level, as they can be sure that their investments will be used to support the development of the territories.

Fifth, fiscal decentralization contributes to the maintenance of social services. Decentralization allows local governments to better respond to the needs of the population for social services, such as education, health care, and social protection.

Overall, fiscal decentralization plays an important role in the recovery and development of communities after the war, helping to strengthen their financial capacity and improve the quality of life of their residents.

There are several approaches to defining the concept of decentralization, as it can have different dimensions and be applied in different contexts. The main approaches to defining decentralization include:

1. Geographical approach: in this context, decentralization refers to the transfer of power and resources from the central level of government to regional or local levels. This may include the creation of autonomous regions or local governments with significant powers.

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

2. Political approach: in a political context, decentralization is defined as a process of increasing democratic participation and citizen influence in local governance processes. This may include the creation of local councils, democratic mechanisms and instruments of public control.
3. Financial approach: financial decentralization is defined as the transfer of financial resources from the central government to local governments. This approach may include the redistribution of taxes, grants and other budgetary resources.
4. Functional approach: in this context, decentralization is defined as the transfer of specific functions and powers from the central level of government to local governments. This may include the management of education, health care, local infrastructure, etc.
5. Economic approach: in the economic context, decentralization can be defined as increasing market mechanisms and competition at the local level, where different local governments or enterprises have more autonomy in conducting business and managing resources.

In this context, the financial approach will be used. It considers strengthening the financial capacity of territorial communities and enhances their ability to develop themselves.

Table 3.2 shows the main approaches to the definition of “decentralization” and “fiscal decentralization”.

Table 3.2. Generalization of approaches aimed to define the “decentralization” and “fiscal decentralization” concept [16; 93; 168; 217; 231; 232; 326; 317; 382; 386]

No.	Concept definition by scientists	Author, source	Key definition aspect
1	2	3	4
1	Decentralization in the theory of public finance and public sector is conditioned by the need to optimize the functions of the state in the production of public goods. This is done by allocating decentralized local public goods and their financial provision	P. Samuelson [326] K. Arrow [16] R. Musgrave [217]	Function of the state to produce public goods

**3.1. The role of fiscal decentralization in the formation of territorial communities
financial capacity in the post-war period**

Continue of table 3.2

1	2	3	4
2	<p>Decentralization is:</p> <ul style="list-style-type: none"> – structural decentralization, defined by the number of levels of government in accordance with the state structure of the country; – institutional decentralization, reflecting the degree of formal participation of representatives of subnational authorities in the decision-making process of central authorities; – decentralization of powers, which characterizes the range of issues that subnational authorities can address independently of the central government; – decentralization of resources (distribution of financial, material, human and other resources between central and subnational levels); – electoral (political) decentralization, related to the procedure of formation of institutions of representatives of destination authorities. – deconcentration (quasi-decentralization), which implies the dispersion of a number of central government functions in the fiscal sphere at different levels of the social structure while retaining control and financing powers. In essence, this measure is more administrative, as the right to make final decisions in the implementation of fiscal policy remains with the central government [241]; – devolution (true decentralization), based on the transfer of expenditure powers and sources of their financing to lower levels of government, which ensures fiscal autonomy of regional and local authorities, as well as increased transparency and accountability of the process of providing public goods [199] 	<p>D. Treisman [386] I. Lunina [196; 197]</p>	<p>The following types of decentralization are considered</p>
3	<p>Decentralization in the budgetary and fiscal sphere is implemented as a process of transferring to the jurisdiction of the lower levels of government the proceeds from the relevant revenue sources with the delimitation of expenditure powers. It contributes to strengthening the independence of territories and achieving a balance of national and territorial interests. The purpose is to increase the efficiency of budget funds utilization and more fully meet the needs of the population in public goods</p>	<p>J. Rodden [317]</p>	<p>Decentralization in the fiscal sphere</p>
4	<p>Decentralization contributes to increasing the efficiency of the public sector, the rate of economic growth, and reducing inter-territorial inequality in living standards</p> <p>The effectiveness of decentralization is achieved under the condition that:</p> <ul style="list-style-type: none"> – there are beneficial for a particular territory; – the population of the territory finances a significant part of the needs in public goods and can ensure the production of public goods 	<p>W. Oates [231]</p>	<p>Decentralization is considered in terms of efficiency</p>

**3.1. The role of fiscal decentralization in the formation of territorial communities
financial capacity in the post-war period**

End of table 3.2

1	2	3	4
5	Decentralization is seen as a mechanism for limiting government over-regulation. Competition among decentralized governments, just as competition in the private sector, in the context of a decentralized budget system «may offer a partial or total substitute for explicit budgetary constraints on the taxation of power»	B. Weingast [25; 408]	Deregulation mechanism
6	Decentralization (from Latin de - «negation», centralize - «middle, central») means «the destruction, abolition or weakening of centralization and the empowerment of lower-level governments» The term «decentralization» implies the division of all administrative rights into those that fall within the competence of the of the state and those that are delegated directly to the community In terms of the distribution of functions between levels of government the following types of decentralization are distinguished: political, administrative and fiscal (financial)	O. Ytushenko, V. Andriash [415, p. 65–66]	Deregulation mechanism
7	Fiscal decentralization increases competition among local authorities and limits the size of the public sector. Decentralization increases efficiency, as local authorities have better information about the needs of their residents, unlike the central government	Ch. Tiebout [382]	Autonomy to finance and provide the population with public goods and services
8	Fiscal decentralization is the process of distributing functions, financial resources and responsibility for their use between central and local levels of government	N. Bykadorova [21, p. 146]	The process of resource distribution
9	Fiscal decentralization is the process of transferring certain revenues or a part of them to the revenue structure of local government budgets, as well as setting taxes and local fees and even determining their own tax policy	V. Grom, A. Kudai [116, p. 26]	The process of income distribution
10	Fiscal decentralization is a process associated with the transfer of a certain part of duties, responsibilities and powers «to the ground» from central authorities and governance in the state, with the ultimate goal of increasing the efficiency of the formation, distribution and redistribution of national financial resources	N. Demchyshak [61, p. 26]	The process of transferring duties, responsibilities and authorities

The essence of the concept of “fiscal decentralization” is the transfer of financial powers and resources from the central level of government to local authorities and institutions. The main aspects of this concept include:

- redistribution of financial resources. Fiscal decentralization involves the distribution of budgetary funds and financial resources between different levels of government, in particular between the central government and local authorities;

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- transfer of powers. In addition to financial resources, fiscal decentralization involves the transfer of power and decision-making authority to the local level in areas such as education, healthcare, infrastructure, social protection, and others;
- increased responsibility. One of the main ideas of fiscal decentralization is to increase the responsibility of local authorities for managing finances and the quality of public services;
- promoting the development of territories. Fiscal decentralization can stimulate regional development, as local authorities have a better understanding of their needs and can set priorities for development;
- involvement of citizens in the development of territories. This process can also facilitate the involvement of citizens in decision-making and control over the use of budget funds at the local level.

In general, fiscal decentralization promotes self-governance, increases the responsibility of local authorities, and contributes to regional development and the quality of public services.

Despite the positive aspects of fiscal decentralization, it has its positive and negative effects.

Positive effects of fiscal decentralization are [61; 93; 144; 146]:

- 1) reducing the negative impact of state intervention in regional development;
- 2) self-development based on a clear definition of problems and prospects for using the potential of available resources on the ground;
- 3) creation of conditions for increasing the financial self-sufficiency of regions by increasing the role of regional authorities in the socio-economic development of regions;
- 4) reducing corruption risks in the redistribution of budget funds, etc.
- 5) financial independence of territorial communities in providing their residents with public goods;
- 6) creating conditions for better meeting the needs of the local population;
- 7) increasing the responsibility of local authorities to the population of the respective administrative-territorial units;
- 8) stimulating the public sector to respond to the demands of citizens;
- 9) creating a competitive environment at different levels of local government for labor, other factors of production and consumers of public goods;
- 10) formation of an effective equalization system to stimulate the development of territories;
- 11) increasing the competence and qualifications of local governments in the process of addressing issues related to the development of their respective territories;

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- 12) system dynamism, ability to experiment and innovate in the provision of public services;
- 13) equalization of powers at different levels of government.
Disadvantages of fiscal decentralization are [61; 93; 144; 146]:
 - 1) arbitrariness of local officials, spread of corruption schemes;
 - 2) difficulty in harmonizing the local needs of territorial communities with the macroeconomic needs of the country;
 - 3) the emergence of regional fiscal discrepancies;
 - 4) reduction of centralized budgetary control over the formation and effective distribution of budgetary resources;
 - 5) restrictions on the centralized equalization of the revenue and expenditure parts of the budgets of territorial communities.

The decentralization reform is aimed at creating an effective system of territorial organization of power, conditions for self-sufficiency of local self-government, and spatial development of territorial communities. It is expected to achieve certain socio-economic effects at the regional and local levels, which can be achieved through the creation of the necessary conditions for the livelihoods of the population of territorial communities, the provision of social and administrative services to the population at a decent level, and the alignment of the interests of the state and the united territorial communities.

Decentralization of power implies a system of governance that redistributes functions between the central government and local governments in favor of the latter in order to ensure a decent level and quality of life in territorial communities.

The definition of decentralization of power by the International Center for Policy Studies as the transfer of powers and budget revenues from state bodies to local governments that are responsible for increasing the capacity of territorial communities indicates the task of the reform to create conditions for the proper fulfillment of the government's social responsibilities to the population through socio-economic growth of the territory and ensuring the financial independence of local governments.

Decentralization of power helps to reduce the negative impact of state intervention in the development of regions and territorial communities, promotes self-development based on a clear definition of urgent problems and prospects for using the potential of available resources, creates conditions for increasing the financial self-sufficiency of regions by increasing the role of regional authorities in the socio-economic development of regions.

Deregulation processes in the budget sphere are directly related to the decentralization reform, which involves expanding freedoms and removing barriers to self-development of territorial communities, districts and regions, and entrepreneurial activity (Figure 3.1).

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

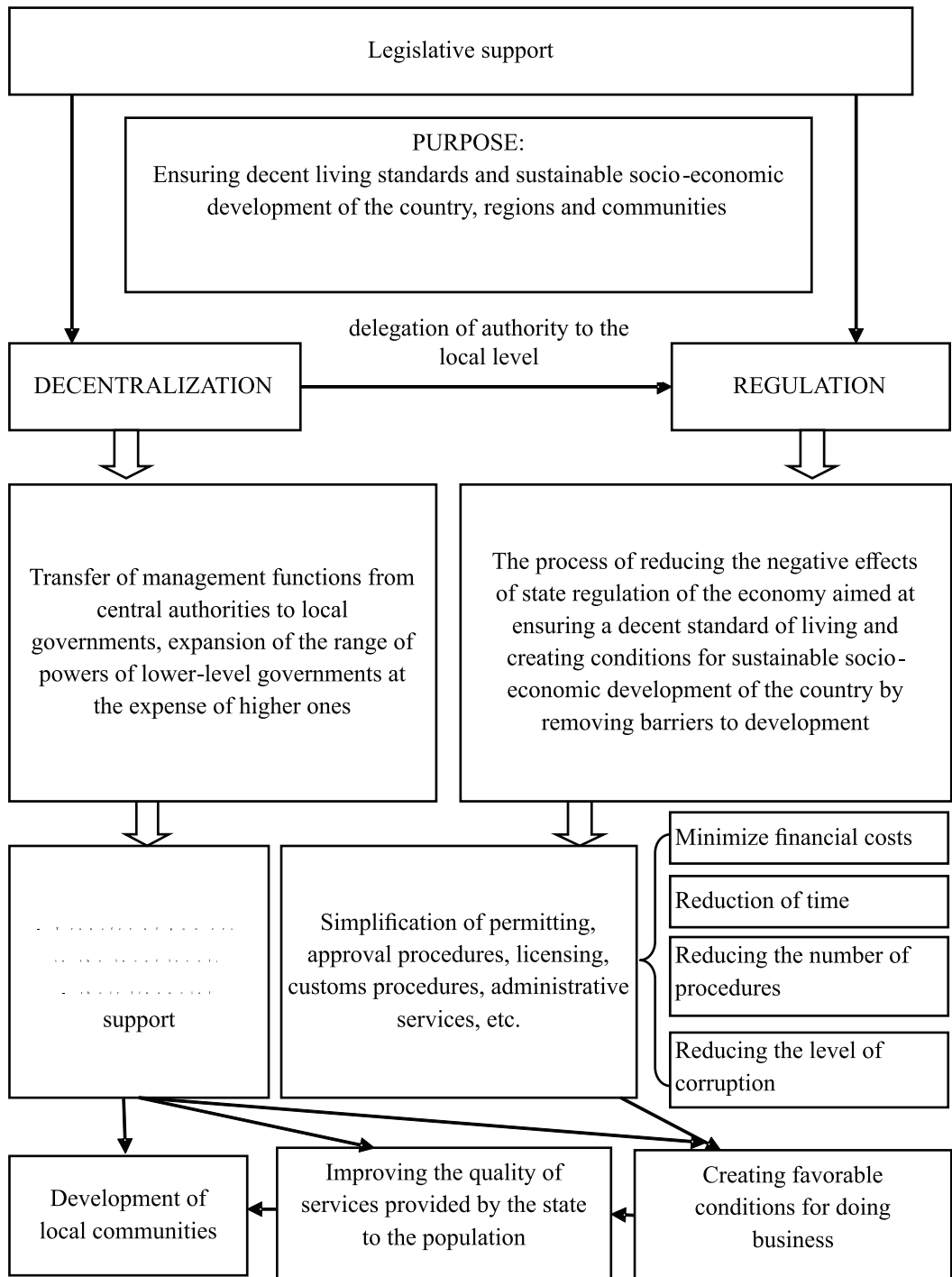


Fig. 3.1. Interconnection between deregulation and decentralization of the economy in the spatial development of territorial communities

Source: formed by the authors [145–147].

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

Financial (fiscal) decentralization is considered as “the process of distribution of functions, powers, financial resources and responsibility for their use between central and local governments [21, p. 146]. The implementation of fiscal decentralization in Ukraine requires a review of the division of powers between governments, reform of the taxation system (both at the level of regions and local governments), and increased opportunities for financially capable territories to raise funds [27]. Thus, this indicates the expansion of the capacity of regional authorities for self-development.

In the context of globalization transformations and the need to restore Ukraine after the war, the issues of strengthening the competitive position of the national economy, including by creating conditions for socio-economic development of the regions, are becoming increasingly important.

At present, there are a number of unresolved issues related to regional development in the context of their financial self-sufficiency, motivation of local governments to increase the efficiency of using the tax potential of the territory, expanding their rights in the context of solving economic issues, financial support for their powers, etc.

The main goal of fiscal policy is to redistribute powers and financial resources to ensure them between budgets of different levels.

1. Sustainable socio-economic development of a region is determined by a rational combination of state and regional policies.

Ukraine’s competitiveness directly depends on the socio-economic level of development of regions and territorial communities, which have their own potential for growth, both social and economic.

State support for regional competitiveness is important, but their sustainable socio-economic development requires a rational combination of centralization and decentralization of functions.

Centralization of management of the regions and territorial communities development implies concentration of management in the center with the creation of a management hierarchy, in which management decisions on further development of regions are made in the center, at the top level of the hierarchy, and the implementation of these decisions is entrusted to the lower levels of the hierarchy, i.e. to regional and local authorities. At the same time, lower-level authorities, deprived of many rights in the field of managing economic growth in the region, do not have the opportunity, and therefore are not motivated to intensify activities to stimulate business entities.

To improve the effectiveness of fiscal relations between the center and the region, it is necessary to take into account the principle of subsidiarity, according to which it is necessary to redistribute the authority to manage regional development to lower levels of the hierarchy, if it is more effective than at higher levels of government.

3.1. The role of fiscal decentralization in the formation of territorial communities financial capacity in the post-war period

An objective assessment of the needs of the regions, problems and opportunities for solving them in the most rational way should be the priority competencies of local authorities due to the direct availability of the necessary resources (information, human, etc.), as well as a set of tools for prompt management decision-making.

At the level of a region, the most objective way to distinguish the scope of needs that can be met with the resources of the region itself on the basis of management decisions of local authorities, as well as the needs that require state intervention. Thus, there is a directly proportional dependence: the more powers are transferred to local authorities, the more effective the management of regional development is.

The delegation of responsibility to regional governments is important in the process of delegation of powers, which also encourages local governments to improve the efficiency of their powers.

At the current stage of development of Ukraine's economy, there are legislative contradictions in the distribution of functions, which often causes their duplication and violates the integrity and efficiency of interaction between different levels of government. Therefore, the mechanism of redistribution of functions, responsibility and financial support of delegated powers requires legislative consolidation.

2. Rational distribution of functions between the center and the regions requires adequate financial support.

Effective management of regional development based on decentralization of functions requires improvement and reform of the system of financing local self-government. It is not enough to redistribute powers between different levels of government; financial support is needed to ensure the effective implementation of all functions.

Financial support should be understood as a system of sources and forms of financing for the development of economic and social spheres of the region. The problem of financial support for local authorities in Ukraine is the lack of incentives to fill the revenue side of the local government budget. It is necessary to create conditions for intensifying the mobilization of funds from all potential sources, which is possible with close and organic cooperation between local governments and business entities.

3. The rational management of "center-region" fiscal relations makes it expedient to move to the principles of fiscal decentralization.

Based on the need for a rational redistribution of management functions between higher and lower levels of government, as well as financial support for these functions based on increasing the level of self-financing of the territories, it is advisable to gradually move to the principles of fiscal decentralization.

The model of fiscal federalism implies a special form of building interbudgetary relations based on the rights of regional authorities to receive revenues and rationally

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manage expenditures. In other words, it provides for the autonomy of budgets at different levels of government, taking into account the interests of all levels of the hierarchy.

The main idea of fiscal federalism is to create conditions for self-financing of regional expenditures. Increasing the revenue side of local budgets is possible by forming a list and amount of local taxes that would ensure normal socio-economic development of the region.

At the same time, there is a risk of ineffective decision-making at the regional level and irrational use of budget funds. In order to minimize these risks, it is necessary to shape the motives of regional authorities in the interest of obtaining the best results with the least losses.

From this point of view, the model of fiscal federalism is successful, as it allows for a rational combination of centralization and decentralization of management functions, taking into account the expediency of redistributing them between state and regional authorities.

The principles of fiscal decentralization should be understood as regularities, statements that are important and essential for increasing the competitiveness of territorial communities and the national economy.

It is proposed to determine the list of principles on the basis of generalization of the principles of public administration and the principles of fiscal federalism. The rationale for this approach to defining the principles of fiscal decentralization is the need to subordinate the peculiarities of ensuring financial self-sufficiency of the regions to the principles of public administration of a unitary state.

This combination of principles makes it possible to take into account the peculiarities of state unitarism and the principles of fiscal relations in the European Union, which are based on subsidiarity. On the eve of Ukraine's aspirations to join the EU, it is advisable to take into account the canons of European legislation and rationally adapt them to the possibilities of application in the Ukrainian economy.

L. Prykhodchenko notes that the change of social paradigms, as well as the impact of the European policy synergies at the national and regional levels in the European Union countries have undergone significant changes over the past two decades, which led (despite significant differences in economic, social and historical conditions of development) to note some common principles for all public administration systems [291].

For the member states of the European Union, there are common principles that, like standards, must be recognized and observed by national public administration systems in the European administrative area, regardless of their structure, namely: reliability and predictability (legal certainty); openness and transparency; accountability; efficiency and effectiveness [86, p. 15–25].

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Good governance guidelines, as well as criteria for “good governance” and principles formulated by the European Union Commission, the World Bank and the Organization for Economic Cooperation and Development (OECD), differ in the extent to which they focus on certain key factors. In particular, the principles of “good governance” defined by the OECD are the following: the rule of law; openness and transparency of democratic institutions; fairness and equality concerning citizens, including the provision of advisory services and participation in decision-making; efficiency and effectiveness of services; clarity, transparency and enforceability of laws and regulations; sustainability and integrity in policy-making; high ethical standards of behavior [93].

In substantiating the principles of budgetary federalism, M. Kozoriz, G. Vozniak [163] understand the principle of autonomy as the consolidation of own sources of income at each level of government with the possibility of determining the directions of their use.

The principle of subsidiarity is the result of the need to harmonize the interests of different levels of state and local government. According to the principle of subsidiarity, N. Brovinska notes that “state intervention is permissible only when it is impossible to achieve the goals without its help”.

The principle of subsidiarity is one of the cornerstones of the European Union legislation and a basic requirement of the European Charter of Local Self-Government [86]. The thesis that European integration is impossible without the introduction of subsidiarity is proved by a huge number of studies and can be considered an axiom.

R. Musgrave formulated the following principles of fiscal federalism [217]:

- the principle of correspondence: the decision to produce public goods should be made by those citizens who live in the territory where the benefits will be received and payments will be collected to finance the public good;
- the principle of centralized redistribution: changes in distribution should be entrusted to the central government, which has the necessary levers to implement distributional policies;
- the principle of financial equalization: in the absence of adequate individual distribution policies, the central government should provide a degree of equalization between better and worse off sub-central governments;
- the principle of nationally desirable goods: the central government can stimulate the provision of certain local public goods with targeted transfers, since their production is characterized by spatial externalities or they are particularly important goods from a national perspective.

Thus, the principles of reforming fiscal relations between the center and the region should include the following (Figure 3.2):

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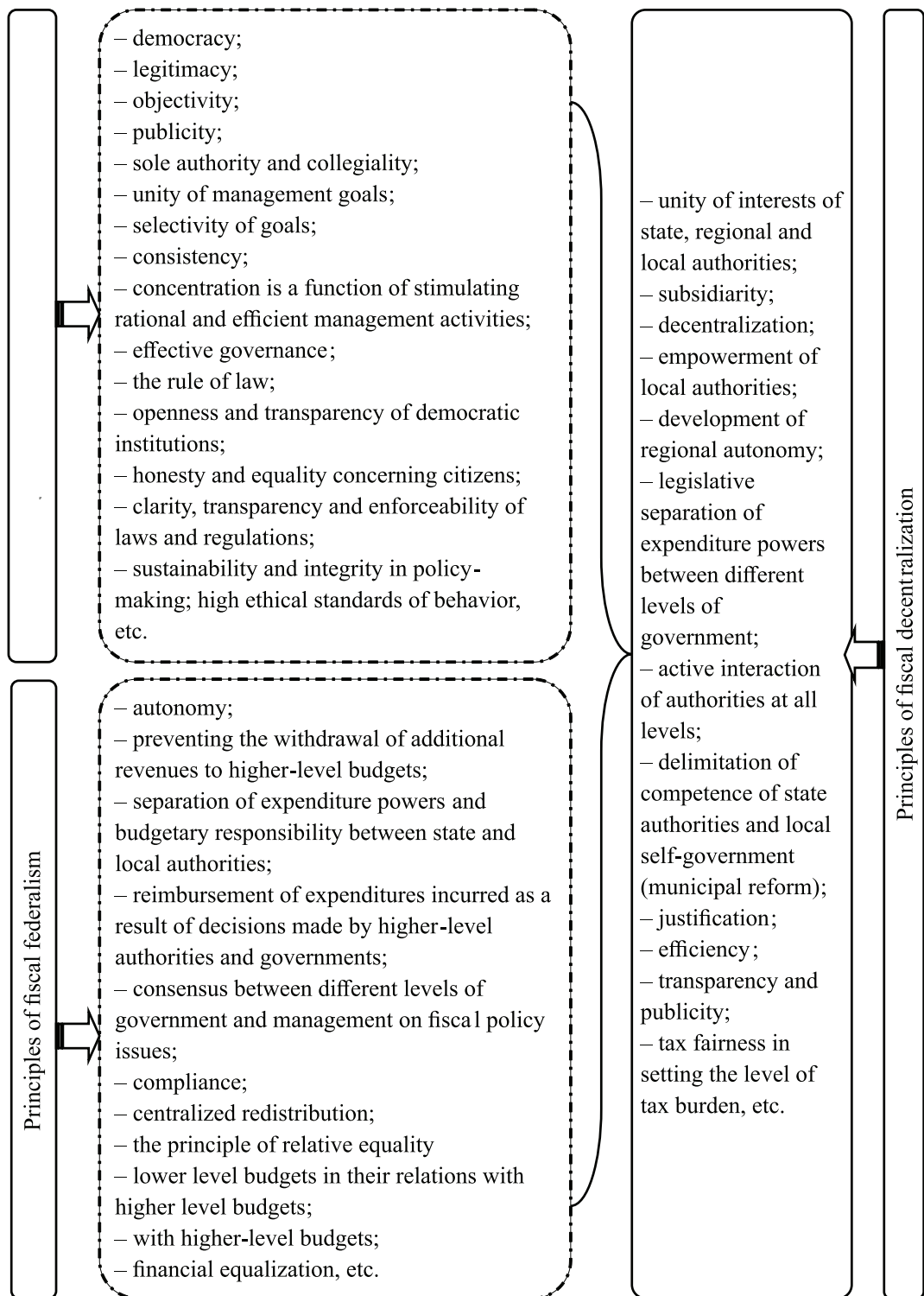


Fig. 3.2. Basic principles of reforming fiscal relations between the center and the region

Source: formed by the authors [86; 146; 163; 237; 291].

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Thus, the main principles of fiscal decentralization in the context of recovery should be as follows:

1. **Autonomy:** Local governments should have autonomy to determine their fiscal priorities, make decisions on resource allocation, and create local budgets.
2. **Predictability:** local governments should be provided with predictable funding to enable them to plan and implement long-term development projects.
3. **Transparency and openness:** financial processes at the local level should be transparent and accessible to the public to ensure effective control over the use of budgetary resources.
4. **Fiscal responsibility:** local governments should be responsible for the efficient and effective use of financial resources and for achieving fiscal sustainability.
5. **Ensuring equal opportunities:** fiscal decentralization should ensure equal opportunities for different regions and local communities in accessing financial resources and social services.
6. **Preserving financial sustainability:** decentralized structures should be able to ensure financial sustainability, avoid deficits and levies, and maintain local services.

These principles contribute to the creation of a system of fiscal decentralization that promotes the development of local communities, increases the efficiency of governance and improves the quality of public services.

Criteria of effectiveness of fiscal decentralization. The main criteria of effectiveness of fiscal relations should include:

- increase in the level of financial independence (self-sufficiency) of regions and territorial communities;
- the level of growth of the revenue part of local budgets;
- the share of targeted subsidies in the structure of inter-budget transfers;
- the share of equalization grants in the structure of inter-budget transfers;
- the ratio of targeted (subsidies) and non-targeted (equalization grants) components of interbudget transfers;
- reduction in the number of territorial communities dependent on the central budget;
- the share of tax revenues, non-tax revenues and subsidies in the revenues of the respective budgets;
- the share of donor territorial communities;
- share of territorial communities – recipients;
- the level of socio-economic indicators of regional development;
- the size and structure of losses from inter-budgetary flows of budgetary funds;
- the level of utilization of the strategic (economic, tax) potential of territorial communities;

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- the level of growth of new jobs in the territorial community;
- the level of growth of innovation and investment activity in the territorial community, etc.

4. The rational degree of federalism depends on the level of socio-economic development of the country and is different in different periods and conditions.

Despite the numerous advantages of federalism as a model of intergovernmental fiscal relations, the unitary system also has advantages in some periods of state development. Thus, in times of socio-economic and political instability, crises and environmental disasters, it is necessary to apply methods of reforming fiscal relations based on centralized management and ensuring maximum concentration of resources in priority areas.

For example, during the natural disaster in Japan caused by the earthquake and subsequent tsunami in 2011, only centralized management and centralization of resources contributed to the prompt elimination of the consequences of the natural disaster, which influenced the rapid establishment of social and economic stability in the country.

The consequences of war, natural disasters, crises, etc. for different regions will be different, which requires mobilization of financial, material, human and other resources that can be redistributed from less affected regions to equalize the socio-economic situation in the country. The effectiveness of these measures can only be ensured by centralized management. In such situations, decentralization of governance can lead to biased decisions at lower levels of government, chaos and threats to national security.

The conditions for the effectiveness of the fiscal federalism model include: coherence of interests of the subjects of intergovernmental relations at all levels; division of powers between all levels of government in terms of expenditures and revenues; adequate distribution of functions and their corresponding resources; efficiency of spending, state socio-economic and political expediency; balancing regional needs and their financial capabilities, etc.

5. Harmonious socio-economic development of the region requires ensuring conditions for stimulating priority areas not only at the national but also at the regional level.

Fiscal policy is aimed at priority areas of economic development (support and development of high technologies, stimulation of innovations, energy saving, agriculture, infrastructure development, etc.)

Local authorities should be empowered to motivate business entities located in a particular region to develop priority areas.

To help revitalize the economy of territorial communities under martial law and after the war, it is necessary to strengthen cooperation with donor organizations

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of European countries to build and modernize the infrastructure of the respective communities, as well as to prepare for the implementation of projects for their post-war socio-economic development. After all, in the context of hostilities in the south and east of Ukraine, European partners have largely refocused on military support for our country and assistance to refugees who were forced to leave for their countries. This created a certain “institutional vacuum” in terms of shaping the foundations of Ukraine’s postwar socio-economic development, particularly in the context of our country’s integration into the EU and the adaptation of modern European values to the national social fabric. As a result, after the end of the active phase of the war, especially if it drags on for a certain period, we may find ourselves in a situation where a significant part of Ukrainian society and government officials are not ready for the transition to an economy of spatial development in a peaceful state [333].

6. An effective system of relations between the center and the regions requires minimization of irrational financial flows between budgets of different levels, which minimizes budgetary losses, including transaction, time and corruption losses. Subjective losses are associated with an increase in corruption risks due to the presence of the human factor at each stage of the movement of financial resources.

7. The formation of a rational structure of the revenue side of local budgets requires an increase in the share of tax revenues with a corresponding decrease in the share of transfers.

The problem of financial support of local budgets should be solved by intensifying the economic and business activities of local authorities in order to increase the share of own and assigned sources of revenues in local budgets and reduce the share of transfers, as well as to increase the number of regions that do not require significant transfers from the state budget.

The economic development of a region directly depends on maximizing the efficiency of using the strategic potential of the territory with its human, material, technical, technological, and other resources.

It is at the lower levels of government that it is possible to maximize the use of a synergistic approach to regional development, which allows for the consideration of all potential opportunities of the region, as well as organizing their interaction on the basis of maximum efficiency. Rational management of efficiency gains will increase the region’s competitiveness.

Stimulating the activity of business entities through the use of regional policy instruments (e.g., tax incentives) will help to increase the income of enterprises, individual entrepreneurs, and households, which will expand the tax base and thereby increase the share of tax revenues to local budgets.

In this regard, it is important to determine and utilize the tax potential of the region, which reflects the availability of territories with their own tax revenues in

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accordance with the specifics of redistribution of tax revenues between different levels of the budget as set forth in the legislation.

Effective management of the socio-economic potential of a region, taking into account the expansion of the powers of regional governments, increases its financial independence, which allows either minimizing the share of transfers or completely abandoning them due to the financial self-sufficiency of the region.

8. A prerequisite for ensuring financial independence of the regions is to shift the emphasis in the formation of budget revenues from fixed taxes to local taxes.

Reforming the fiscal relations between the center and the regions should be based on creating conditions for the formation of local budgets, when the revenues of local taxes and fees will grow faster than the revenues of taxes assigned to local budgets. This approach is based on the existing imbalance in the rights of local governments in favor of local taxes and fees. It is for these payments that local governments retain the right to establish tax privileges, which creates the possibility of indirectly stimulating the development of priority areas of socio-economic development for the region.

It is necessary to promote the role of local taxes and fees by finding stable and rapidly growing tax bases, as well as establishing effective tax administration that will allow for maximum revenues to local budgets at minimal cost [350].

Legislative consolidation of the local budgets' own sources of revenues in the required amount and with stability will guarantee the independence of local governments, which will optimize the number of subsidized local budgets by motivating local governments to develop their own tax potential.

9. The list of taxes that are partially assigned to local budgets should include primarily those taxes whose tax bases can be influenced by local authorities.

The activation of the position of local governments in tax and budgetary relations and their active involvement in tax regulation processes puts a new emphasis on the list of taxes and fees partially assigned to local budgets.

It is most appropriate to include in this list those taxes and fees, the amount of which is directly or indirectly related to the efforts of local governments in the field of socio-economic development of regions. For example, the amount of corporate income tax revenues depends to a certain extent on the success of local governments in creating conditions for effective management in the region and developing market infrastructure (promoting the creation of innovative research and production clusters, implementing regional targeted comprehensive programs, etc.) Revenues from value added tax in each region are determined, among other things, by the purchasing power of the population and the level of development of the trade network in the region. Therefore, the national taxes cited as an example can be classified as fixed taxes and fees.

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According to I. Lunina, “in order to increase the financial autonomy and efficiency of local budgets, it is necessary to ensure a certain correspondence between the responsibility of local authorities for the provision of local public goods and services and their powers to expand their own tax revenues” [196].

“An important source of revenues for local budgets of Ukraine should be revenues that are user fees for goods and services provided at the level of territorial communities. Increasing the financial autonomy of local governments of united territorial communities requires a change in the system of distribution of personal income tax among local budgets. In line with the objectives of budget decentralization (to better meet the needs of local residents for public goods), personal income tax should be collected at the place of actual residence of the taxpayer. Under such conditions, the personal income tax will serve as a price for local public goods, since the needs of the population for public goods (as well as the needs for private goods) depend on the level of income. If this tax is charged at the place of residence of its payer, then differences in the tax burden on residents of administrative units will determine differences in the volume of provision of such goods.” [196, p. 301–302].

“It is advisable to increase the tax powers of local authorities of Ukraine by expanding the types of real estate tax to be paid by businesses, whose participation in the formation of local budget revenues is rather limited, as well as by granting local authorities additional rights to change the relevant tax rates.” [197].

According to N. Demchyshak, it is necessary to work at the level of the state and local governments to optimize the structure of tax revenues to territorial budgets in terms of increasing the share of local taxes. However, positive trends in local budget revenues and the reliability and quality of such sources have already been established in recent years.

Addressing the problems of fiscal independence of territorial communities in Ukraine should take into account the need for digital transformation in the public and business sectors at the state, regional, and community levels. The development of digitalization initiatives, in particular by improving the capabilities of the Diia electronic service, will improve the quality of public services, save budget funds, and minimize bureaucratic risks both at the level of individual needs of residents and at the level of needs of businesses.

International experience shows that the most successful models of regional development include a sufficiently high level of financial autonomy of local authorities, which allows them to plan their own development strategies independently, coordinating them with the necessary level of budgetary funds for their implementation, which increases their realism and quality of implementation. The revenues of regional and local budgets are the main source of fiscal decentralization, as they ensure the relationship between tax revenues and the production of public goods.

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10. The amount and structure of intergovernmental transfers should be based on the level of socio-economic development of the regions.

Intergovernmental transfers serve as a tool for financial equalization of the socio-economic situation of regions. This important tool leads, on the one hand, to a decrease in the financial independence of the regions, and, on the other hand, to their support in providing social guarantees to the population of the territories of Ukraine, which have equal social rights regardless of the level of development of the regions, and also contribute to the development of priority areas of the country's development and increase in economic performance.

The importance and expediency of providing intergovernmental transfers of the appropriate volume and structure should directly depend on the level of socio-economic development of the regions after the war.

It is not enough to take into account the ratio of revenues and expenditures of local budgets when determining the volume and structure of intergovernmental transfers; it is necessary to take into account the region's own potential economic growth opportunities. On the one hand, such an approach will stimulate the activation of internal reserves of the regions, while on the other hand, the provision of significant transfers to local budgets from the higher level budget aimed at equalizing intergovernmental relations does not produce the expected results, since the largest share of intergovernmental transfers is accounted for by equalization grants, which are untargeted and whose main purpose is to cover current expenditures of local budgets.

When formulating the amount of intergovernmental transfers in accordance with the legislatively established formulas for determining the amount of subventions, it is necessary to revise them in terms of weight shares in relation to the expenditure needs of the regions.

The structure of intergovernmental transfers is characterized by unjustified unevenness of equalization grants. The emphasis should be shifted to increasing targeted subventions.

11. Fiscal decentralization should be aimed at creating conditions for activating the position of local governments to equalize the level of socio-economic development of regions.

The emphasis in equalizing the socio-economic development of regions should be shifted from transferring budget funds to different regions at the expense of other regions' budgets to ensuring conditions for equalization at the expense of the regions' own reserves.

The key to success in this direction should be an understanding of the fact that an important factor in socio-economic development is not so much the availability of resources in a region as the efficiency of their use.

The regions of Ukraine have a diverse resource base and different levels of socio-economic development. It is important to increase the competitiveness of the

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national economy to develop areas to strengthen the position of each region through the use of various methods of state regulation, including tax and budgetary ones. However, excessive amounts of state support in the form of intergovernmental transfers reduce the motivation of regions to intensify their own efforts to develop their socio-economic situation.

Monitoring of the socio-economic development of regions allows to assess the situation of the region not only in static terms, but also to show the dynamics of changes, develop strategies for further development of the region, identify its strengths and weaknesses, opportunities and threats. The potential of the region can be developed and effectively used by encouraging local governments to develop areas and implement measures to increase the synergistic effect of using the region's resources.

When determining the need, structure and size of intergovernmental transfers as a way of financially equalizing regional imbalances, it is necessary, first of all, to develop a system for diagnosing intraregional causes of imbalances in the revenue and expenditure components of the budget and uneven socio-economic development. Regional authorities should be empowered to eliminate this imbalance by stimulating an increase in budget revenues, and responsibility for the powers granted should be redistributed, which also encourages local governments to mobilize all efforts to improve the socio-economic indicators of the region's development.

Thus, fiscal decentralization contributes to the recovery of Ukraine's territories through:

1. Transfer of financial resources: Fiscal decentralization can be defined as the transfer of financial resources (e.g., taxes, grants, revenues) from the central government to local governments. This allows local governments to have a larger budget and financial autonomy.

2. Transfer of financial responsibilities: In this approach, fiscal decentralization means the transfer of financial decision-making authority to the local level. This may include setting tax rates, setting budget priorities, and exercising financial control at the local level.

3. Mechanisms of financial exchange: Some definitions of fiscal decentralization focus on mechanisms for the exchange of financial resources between central and local governments. This may include regional or local fiscal systems where resources are collected and distributed at different levels of government.

4. Autonomy of local governments: Fiscal decentralization can also be defined by increasing the fiscal autonomy and independence of local governments in managing finances and budgets.

5. Effective use of resources: Some approaches to fiscal decentralization emphasize not only the transfer of resources, but also their effective use at the local level to support social and economic development.

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An important step in building a new space for the development of regions and territorial communities based on fiscal decentralization should be the introduction of a strategic approach and the ability to efficiently absorb investments. The relevance of using the strategic approach is also determined by the intensification of European integration and interregional cooperation between the regions of Ukraine and the EU regions as a way to identify the competitive advantages of economic agents and the national economy as a whole [333].

Stimulating the self-sufficiency of regional development requires directing the state policy of regional development to provide the region with highly qualified personnel; developing intellectual capital; establishing constructive cooperation between educational institutions, research institutions and regional enterprises; stimulating the development of social partnership; increasing the level of innovation and investment capacity of regions and territorial communities; creating a favorable investment climate; implementing reforms to deregulate the economy; developing public-private partnerships, etc.

Overcoming the challenges for local governments and ensuring the effectiveness of the decentralization reform requires the implementation in the near future of such urgent areas as: comprehensive regulation of legislative provisions in all areas of development and functioning of the country's territories, development of measures to stimulate the functioning of united territorial communities; development and approval of the criteria for the functioning of the newly created territorial communities in the post-war period, capable of ensuring not only their own powers in full, but also stimulating their own territorial and human development in the future; ensuring the organization of advisory assistance to the united territorial communities; creation of regional centers for supporting the development projects of the united territorial communities; creating conditions for the creation of a "success story" through the implementation of projects for the development of united territorial communities; ensuring the financial capacity of territorial communities as part of the development of measures to expand the scope and directions of state financial support for the development of territories; taking into account the peculiarities and uniqueness of territorial communities when developing development strategies and investment programs based on an integrated approach to spatial development of territories, taking into account the primary health care network, security centers, hub schools, etc.

Ukraine has the potential to become a strong and prosperous state, and this process depends on the efforts of all citizens, their belief in the future and their joint work for the development of the country.

Today, due to Russia's full-scale military aggression, which is trying to destroy the very essence of the Ukrainian state, Ukraine is undergoing an extremely difficult test of historic proportions. This test, on the one hand, causes fundamental and

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devastating economic, infrastructural, and social consequences, but on the other hand, it finally determines Ukraine's place on the global geopolitical map, shaping its legal subjectivity and finally proving its sovereignty and independence as a European state with a pro-European vector of development.

The activities of territorial communities after the decentralization reform are carried out in a period of constant crisis and transformational changes. After amalgamation, territorial communities began to develop development strategies and begin to formulate plans for their implementation. But then the COVID-19 pandemic broke out, and for more than two years, it has been disrupting the functioning of all economic entities. The year 2022 began for the country with the invasion of the aggressor into the territory of Ukraine and the introduction of martial law. This "external shock" has had a dramatic impact on the country's economy, regions, and territorial communities.

The demographic consequences are striking: according to the International Organization for Migration, a quarter of the country's population was forced to leave their homes, including about 4 million people who left Ukraine. This means losses to local budgets and human resources: loss of working age population, outflow of human resources, and a decrease in student enrollment. 6.5 million people moved within Ukraine and became internally displaced, of whom more than 2.5 million moved to the western macro-region, which may lead to an excess of labor in the regions where a significant number of internally displaced persons arrived, problems with housing and not only temporary housing, risks of public order and public safety, etc. Between 60 and 80% of Ukrainian enterprises have stopped working; more than 50 % of Ukrainians have lost their jobs; tax revenues have fallen by 80 %.

Territorial communities have become the epicenter of reformatting public life to martial law, the basis of social, humanitarian, and economic processes of countering the Russian aggressor. In the process of decentralization, territorial communities have managed to significantly increase their ability to solve complex problems of life and development. However, the war dictates new conditions. Local governments are striving to find effective ways to respond to them. Managing the life of territorial communities under martial law and after the war requires the development of effective mechanisms for solving complex problems by finding and using new opportunities.

Risks for territorial communities due to significant migration of the population include losses of local budgets; loss of labor in regions where active hostilities are taking place; excess labor in regions where a significant number of internally displaced persons have arrived; problems of providing housing for internally displaced persons; risks of ensuring public order and public safety; burden on the medical sector; displacement of vulnerable groups of the population; displacement of a significant number of children requires the organization of a quality educational

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process and adaptation of children. The relocation of enterprises from the war zone under the program of the Ministry of Economy of Ukraine poses a number of risks to local communities: organization of the process of locating enterprises (search for a location, restoration of logistics, assistance in purchasing raw materials and finding markets, environmental safety of the community, etc.); organization of the relocation and resettlement of personnel; organization of recruitment of employees at the place of deployment after the relocation.

On the one hand, these crisis phenomena have mobilized the efforts of the population of territorial communities and their entrepreneurial potential to provide social, economic, and logistical assistance to territorial communities in the area of hostilities, while on the other hand, there are a number of problems and risks that have a negative impact on the development of territorial communities now and in the future.

In order to ensure the vital activity of territorial communities under martial law and increase their ability to solve problems in the new realities, the following should be taken into account under martial law:

- it is important to preserve the country's production potential, which will provide territorial communities with essential goods, and the military of the Armed Forces of Ukraine with modern security equipment and food. To this end, it is necessary to develop a mechanism for the relocation of enterprises with clarification of the criteria for the priority of relocation; regulatory and legal support for the organization of logistics for the relocation of strategic enterprises from the combat zone; a mechanism for coordinating the interaction of state executive authorities and territorial communities on business development; create a portal for enterprises relocated from the active combat zone, a single database of territorial communities with information on the conditions of operation of enterprises in their territories;

- due to internal migration as a result of active hostilities in the east of the country, the urgent need of the day is to organize training for representatives of territorial communities on the implementation of mechanisms to support enterprises and internally displaced persons temporarily residing in new territories; to formulate budgets of territorial communities during martial law and post-martial law; to create a database of territorial communities with information on the conditions of operation of relocated enterprises (placement of production facilities, lease issues, connection to networks, resettlement of personnel and family members; search for employees from the permanent population of the territorial community, etc.); to develop a mechanism for cooperation between territorial communities under martial law in support of territorial communities in whose territories active hostilities are taking place;

- to preserve the country's intellectual potential in the postwar period, it is necessary to introduce a mechanism to simplify the conditions for admission to

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higher education in order to ensure the competitiveness of national education; to introduce a problem-based approach to human resource development at three levels of government: macro, meso, and micro levels; develop methodological recommendations on the specifics of admission for applicants in the combat zone; develop socially and economically attractive mechanisms to stimulate the return of human resources to Ukraine in the postwar period;

– financial support for community life becomes relevant during the period of martial law to ensure decent living conditions for the permanent population of territorial communities and IDPs. To this end, it is important to develop a mechanism of state support for the functioning of territorial communities during martial law to create opportunities for self-development in the postwar period; develop a mechanism for the distribution of educational and medical subventions to territorial communities during martial law to maintain quality services to the population and preserve the intellectual and labor capital of the territories and the country as a whole;

– in order to improve the methodological support for the implementation of state financial support for IDPs, it is important to develop a methodology and system of criteria for the distribution of social assistance and payments for the period of martial law to internally displaced persons and the population of territorial communities where hostilities are taking place;

– in order to improve the regulatory policy in the context of the current tasks of servicing the needs of a significant number of requests, it is necessary to improve the mechanism of the electronic service for internally displaced persons for registration, financial assistance, travel documents, social benefits, etc.

Thus, the problems and risks of territorial communities under martial law should become their new opportunities in the postwar period, but in the face of an “external shock”, territorial communities should mobilize their endogenous potential and, with the help of state regulation, ensure a decent standard of living for the population of the communities.

In order to achieve financial self-sufficiency in the postwar period, it is important to rationally choose the parameters of financial resource decentralization instruments. This should be done by adjusting the tax and budgetary components of regional fiscal policy, which consists of several stages:

At the first stage, the goal is to justify the choice of effective scenarios for decentralizing financial resources between budgets of different levels. Effective scenarios provide for the greatest effect in terms of costs compared to other scenarios.

Taking into account the purpose, subject and object of the study, it should be a scenario that strengthens financial self-sufficiency in the direction of self-financing of the region (or a combination of scenarios). The scenarios should also take into account the powers of local governments, the ability to influence the tax bases for

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the taxes envisaged in the scenarios, and the achievement of all types of efficiency (economic, social).

The next step is to build a model of decentralization of financial resources. At this stage, the indicators to be included in the model and their parameters are selected, the factors influencing the change in the parameters of the output indicators are determined, and logical relationships are built.

Indicators in the model of decentralization of financial resources may include: the amount of total tax revenues and those assigned to local budgets; the level of balance of regional budgets; the amount of own revenues of local budgets; the amount of total revenues of local budgets; the coefficient of budgetary dependence of regional budgets; the amount of intergovernmental transfers, etc.

The parameters are: tax rates; shares of national taxes assigned to local budgets; coefficients and percentages of tax equalization amounts, etc.

The model also takes into account indicators that affect the parameters of the main indicators: the level of wages in the region and territorial community, average per capita income, industrial production, unemployment, losses from the transfer of budget funds to the center and back (funds, time), economically active population, unemployed population, etc. At the same stage, direct and reverse relationships between the model components are established.

The third stage is to determine the impact of factors on the formation of financial self-sufficiency of regional development. These include: the direction of the state regional policy, tax, budgetary, resource potential of the region and territorial community, the amount of tax revenues, relations between the government and business in the region and territorial community, the structure of the regional economy, the availability of its own higher education institutions, the level of development of material sector enterprises, the consequences of decisions and actions of economic policy makers at the level of the respective region and territorial community, etc.

The influence of factors on the main indicators of the model is determined. For example, the increase in tax revenues, in particular the corporate income tax, will be influenced by the population of the territorial community, the solvency of the population, unemployment, inflation, consumer price index, exchange rate, etc. Accordingly, an increase or decrease in one of these indicators will negatively or positively affect the amount of revenues from corporate income tax, value added tax, and local excise tax, which must be taken into account when building the model.

At the fourth stage, scenarios for decentralization of financial resources are developed. The model is based on data and conditions in accordance with the peculiarities of the transformation processes in Ukraine under martial law and in the post-war perspective.

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The insufficiency of local budgets' own sources of revenue leads to increased financial dependence on the center, making it impossible to fulfill expenditure obligations at their own expense. Due to the war in the country, many territorial communities were left without production infrastructure, the number of people decreased, and enterprises were forced to relocate their facilities to other regions. These consequences have led to a decrease in the financial capacity of local communities.

The conditions of martial law create new challenges for territorial communities. On the one hand, they must take threats to the livelihoods of their territories seriously. On the other hand, it is important to mobilize their resources to the maximum extent possible to solve various important tasks. In this context, success depends on the creation of adaptive organizational management based on effective coordination between local authorities, government agencies and civil society organizations. It is important to use all available means of coordination, including institutional, legal, organizational, informational and financial, to achieve synergistic results in various aspects of economic, financial, social, resource and infrastructure interaction.

In order to support the revitalization of the economy of territorial communities in the post-war situation, it is important to strengthen cooperation with donor organizations from European countries to modernize the infrastructure and socio-economic development of these communities. European partners have reoriented their support to the military and refugee assistance, which has created an institutional vacuum in the development of post-war Ukraine. Therefore, it is necessary to create programs and projects in cooperation with European partners to prepare public officials and citizens for post-war socio-economic development and strengthen the financial self-sufficiency of the territories. Territorial communities and local governments should play an active role in facilitating this process, especially those located near the EU border. It is important to implement a strategic approach and effectively use investments to stimulate development. Expanding European integration and interregional cooperation is also important for identifying competitive advantages and economic development of the national economy.

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The Strategy for Sustainable Development “Ukraine-2020” [60] envisages the formation of a highly developed socially oriented economy in Ukraine based on knowledge and innovation. The strategy for the development of the innovation economy in Ukraine should be related to ensuring the integrated economic efficiency of all components of the innovation cycle: education, science, technology, innovation as commercialized new knowledge, and economic growth as the target function of the innovation process.

The most effective institutional system that can support the formation and implementation of the innovation cycle is the innovation ecosystem, which combines the economic interests of all stakeholders in the creation and implementation of innovations. This allows to achieve the necessary impact of innovation processes on the structural transformation of the country’s economy towards the formation of the material and technical base of the current and future technological modes.

Within this framework, the development of Ukraine’s innovation potential should be aimed at forming an interconnected set of components of the innovation ecosystem that unites science, education, and business structures to generate innovations.

The implementation of the Strategy for the Development of the Innovation Sector for the period up to 2030 [261] was to allow the creation of a national innovation ecosystem by 2030 and ensure the development and effective interaction of elements of the national innovation ecosystem, which could become a driver of accelerated economic growth, to promote the introduction of new technological solutions. The basic indicators for assessing the effectiveness of the Strategy implementation are the costs of scientific and technical works, innovative enterprises, innovative products sold, etc. (Table 3.3) [131].

According to the Table 3.3, the transfer of technologies and other intellectual property rights was carried out by higher education institutions, institutions, enterprises and organizations subordinated to the National Academy of Sciences of Ukraine, the National Agrarian Academy of Sciences of Ukraine, and the Ministry of Education and Science of Ukraine. The processes of development of the main components of the national innovation system – education, science and business - are hampered by their disintegration and autonomy from each other. In this context, it is advisable to eliminate the dysfunctions of the institution of priority areas of innovation activity, to change the principles of selecting priorities for innovation activity – from chronic underfunding of a wide range of projects to truly priority

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development and popularization of a limited number of important megaprojects. This will allow science, education and business to formulate common areas of cooperation.

Table 3.3. Implementation of innovative products (services) and creation, use and transfer of new technologies by budget funds managers

Period		Adminis- tering Ministry	2016	2017	2019	2020	2021
The number of enterprises that implemented innovative products (services), units	NAS		146	34	10	2	4
	MES		185	314	83	112	201
	NAAS		91	111	219	219	
Including small enterprises	MES		7	2	0	2	0
	NAS		16	151	15	33	45
The volume of sold of innovative products (services) sold by the priority direction, thousand UAH	NAS		96410	13149	12445	2742	14259
	MES		26686	29681	15597	26445	72625
	NAAS		94328	119023	152963	170100	188036
Number of new technologies	Created	NAS	82	48	78	4	8
		MES	94	103	48	82	106
		NAAS	0	714	532	576	294
	Used	NAS	22	2	7	3	7
		MES	22	3	11	0	3
		NAAS	51	36	1	47	41
	Transferred	NAMS	16	2	0	3	4
		NAS	31	26	35	3	4
		MES	26	73	39	71	64
	Revenues from the transfer of new technologies, thousand UAH	NAMS		815	714	532	576
NAS			7546	6595	8834		4859
MES			3029	5940	4289	6609	8135
NAAS		29884	119023	152963	170100	188036	

Another indicator of the effective implementation of the Strategy is the increase in revenues from the sale and use of intellectual property, knowledge-intensive products (results of scientific research and scientific and technical (experimental) development, software, know-how, and other intellectual services) (Table 3.4) [136].

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Table 3.4. Using funds received as a result of technology transfer created at the expense of the state budget

Indicators	2014	2015	2016	2017	2018	2019	2020	2021
Number of technology transfer agreements concluded, units.	4521	3563	3966	3199	2872	1848	1851	1862
Amount of funds received under technology transfer agreements, UAH mln.	55,14	77,56	95,1	144,52	121,93	125,48	218,74	187,95
Funds received under technology transfer agreements, UAH mln.	64,9	74,7	98,3	131,9	111,8	125,48	218,74	187,95
Funds received under technology transfer agreements utilized, UAH mln.	40,9	54,1	85,8	110,3	99,5	118,99	64,86	121,7
Amounts of funds used to pay remuneration to the authors of technologies	4,56	5,33	8,97	9,35	9,46	10,40	3,8	6,44

Thus, scientific institutions and universities mostly transferred the results of research and development rather than finished technologies. On the positive side, it is worth noting the increase in spending on assessing the scientific and technical level of technologies and/or their components as an object of commercialization, purchasing tools, equipment, and facilities necessary for testing, prototyping, conducting experimental research, creating and testing prototypes, and making models, meaning that research institutions and universities used the opportunity to upgrade their infrastructure and equipment, and the pace of patenting increased.

Since 2020, amendments have been made regarding the Procedure and directions of use of funds received as a result of technology transfer created at the expense of the state budget [260], to monitor the amount of funds used to pay persons who transfer technologies and/or their components in order to ensure effective monitoring of the payment of remuneration by enterprises, institutions, organizations to the authors of technologies and/or their components and persons who transfer them; updating the directions of use of funds received as a result of technology transfer.

During 2014-2019, there was a trend of increasing use of funds for payments to technology authors, but the spread of COVID-19 in Ukraine and the world has obviously had a significant impact on this component of the use of funds received under technology transfer agreements. During the period of quarantine restrictions (2020 and 2021), scientific institutions and higher education institutions mainly sold not finished technologies, but the results of research and development, which have a smaller share of funds intended for remuneration to the authors of technologies and/or their components in their cost.

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The strategy states that indirect indicators may also include an increase in Ukraine's place in global rankings related to innovation, in particular, the Innovation and Technology Readiness indicators of the World Economic Forum's Global Competitiveness Index, the Global Innovation Index, the European Innovation Scoreboard, the Talent Attraction Index, the Human Development Index, and the Doing Business and ICT Development Index. Over time, the World Economic Forum's Global Competitiveness Index has been replaced by the Competitiveness Ranking, and global organizations are introducing new global rankings of innovation development, such as the Frontier Technologies Readiness Index (Table 3.5) [22; 51; 72; 85; 108; 224; 372; 374; 411].

Table 3.5. Ukraine's place in the world rankings

Rating	2017	2018	2019	2020	2021	2022
1	2	3	4	5	6	7
Global Competitiveness Index (GCI)	81	83	85	–	–	–
Competitiveness Ranking	60	59	54	55	54	–
World Competitiveness Digital Ranking	60	58	60	58	54	–
Overall talent ranking and factors	59	48	44	42	46	-
Global Innovation Index (GII)	50	43	47	45	49	57
Bloomberg Innovation Index	42	46	53	56	58	–
Innovation Union Scoreboard – IUS	36	33	32	33	34	31
Global Talent Competitiveness Index	69	61	63	66	61	66
Frontier Technologies Readiness Index	–	–	–	–	53	58
ICT rank	–	–	–	–	66	61
Skills rank	–	–	–	–	40	42
R&D rank	–	–	–	–	47	49
Industry rank	–	–	–	–	58	85
Finance rank	–	–	–	–	97	144

Notes: “–” – no data available

The Ministry of Education and Science (MES), together with the Ministry of Economic Development and Trade, conducts an annual survey of the Strategy's innovation stakeholders, including enterprises and business associations, on changes in the national innovation ecosystem, and conducts or orders in-depth studies of issues that are identified as the most problematic for establishing the process of creating and commercializing innovations. Based on such a study, the necessary measures are taken within the competence of the MES, and in other cases, relevant substantiated proposals are submitted to the relevant public authorities.

Therefore, there is a need to determine the readiness of the real sector of the economy to implement technologies developed by domestic higher education

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institutions and research institutions and the necessary measures to intensify technology transfer activities, including possible changes in the allocation of funds to finance relevant areas of research, taking into account the challenges associated with the military aggression of the Russian Federation in Ukraine. According to the letter of the Ministry of Education and Science to ensure participation in the survey “Activities of Higher Education Institutions and Research Institutions on Technology Transfer and Academic Entrepreneurship”, information was received from the following main spending units (Table 3.6) [359].

Table 3.6. SWOT-analyse of the interaction between stakeholders of education, science and business

STRENGTHS	WEAKNESSES
<p>high level of knowledge of scientists in the main and related fields; the opportunity to get active young professionals to work in the company; willingness to cooperate on the part of scientists; high level of professionalism of representatives of the university; scientific potential; high-quality intellectual and technological product; professional development; opportunity to receive expert and technological assistance; high economic efficiency of the proposed solutions; stable demand for the proposed solutions; motivation and efficiency of the research staff; the ability to introduce the latest technologies gradually; dynamic testing of technologies in practice; creative thinking of some students; increasing the innovative component of developments; new forms of work; territorial and mental affinity; combining technological processes into one innovative technology; joint analytical and marketing research; availability of a single information space; joint research and development; the ability to create developments of international level</p>	<p>bureaucratized management system; lack of modern material and technical base for the implementation of developments; disconnection of science from practice and market needs conservatism, for example, paperwork; lack of co-financing from higher education institutions and/or research institutions organization of the cooperation process; scientists are poorly focused on the final practical result; scientists have too theoretical an approach; lack of state financial support for such cooperation; lack of understanding of the structure of venture capital financing; passivity of young people, not all universities and/or universities have a systematic implementation technology; unwillingness to work in rural areas; universities sometimes formally introduce the latest technologies; insufficient research in narrow and rare areas; low ethics of some employees; inexperience; lack of highly qualified personnel; formal approach to cooperation; inconvenient geographical location; high cost; inability of universities to cooperate «to order»</p>

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End of table 3.6

OPPORTUNITIES	THREATS
<p>there was no need;</p> <p>low level of qualification of scientific staff;</p> <p>lack of communication from universities and/or scientific institutions;</p> <p>lack of information from universities and/or scientific institutions about their developments;</p> <p>bureaucratization of the cooperation process and staff bias;</p> <p>universities and/or scientific institutions don't create the required product;</p> <p>lack of transparency regarding cooperation;</p> <p>lack of a separate department at universities that provides information and defines the terms of cooperation;</p> <p>difficulty in establishing the cooperation process;</p> <p>non-competitive price of development;</p> <p>stereotypes related to the quality of education in Ukraine;</p> <p>long duration of the process;</p> <p>lack of a unified sectoral approach to working with innovations</p>	<p>difficulties in obtaining state financial support for innovation activities;</p> <p>lack of information about state institutions that provide support for innovation activities;</p> <p>lack of information on the types of state support for innovation activities;</p> <p>lack/insufficient level of training of personnel in the required specialty;</p> <p>tax burden;</p> <p>obtaining permits and licenses;</p> <p>administrative restrictions;</p> <p>environmental restrictions;</p> <p>difficulties arising during the company registration procedure, in particular, communication with registrars;</p> <p>insufficient level of innovation culture of the public in general;</p> <p>insufficient level of development of companies in Ukraine;</p> <p>financial constraints;</p> <p>lack of incentives at the state level for innovative activities;</p> <p>the need to increase information, moral and financial support for innovative business in Ukraine</p>

Successful innovation ecosystems require proximity and cohesion among participants, which is driven by collective action. It is based on the ability of different stakeholders to communicate and interact effectively across organizational and contextual boundaries. Therefore, in order to understand how innovation ecosystems, develop and grow, it is necessary to understand the interactions that bring together different participants (stakeholders) (Table 3.7).

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Table 3.7. Approaches to understanding the essence of the concept of “innovation ecosystem”

Approach	Concept
Resource	An innovation ecosystem is an evolving set of actors, activities and processes, institutions, and relationships that are important for the innovation activities of an entity or set of entities
Process	An innovation ecosystem is a multilateral environment where different stakeholders interact to solve complex socio-technical problems

According to the resource-based approach, an innovation ecosystem consists of material resources (knowledge, money, infrastructure), human resources (students, teachers, entrepreneurs), and institutions (universities, corporations, start-ups, venture capital funds). Stakeholders use digital tools, knowledge, skills, and a combination of these to gather information and make decisions in innovation ecosystems, motivated to participate by the potential social impact of their contributions.

An innovation ecosystem is characterized by a network of connected and interdependent stakeholders with a range of relationships (from formal to informal and from weak to strong). Such ecosystems also sometimes have a hierarchical structure that reflects different power dynamics and differentiated resources. Successful innovation ecosystems have some form of social cohesion that guides and drives collective action to ensure a stronger, more tightly knit network and greater sharing of resources. Such networks create a set of formal and informal norms and institutional practices that support the types of resource sharing that are the lifeblood of innovation ecosystems.

Innovation ecosystems also consist of complex, historical and constantly evolving interactions between stakeholders, which depend on many overlapping parameters, such as the location where the interaction takes place, the specifics of the stakeholders and the technology itself. Diverse networks of interacting stakeholders whose main goal is technological development form an innovation ecosystem.

The Strategy for the Development of the Innovation Sector for the period up to 2030 [261] specifies the structural elements of the national innovation ecosystem (Fig. 3.3).

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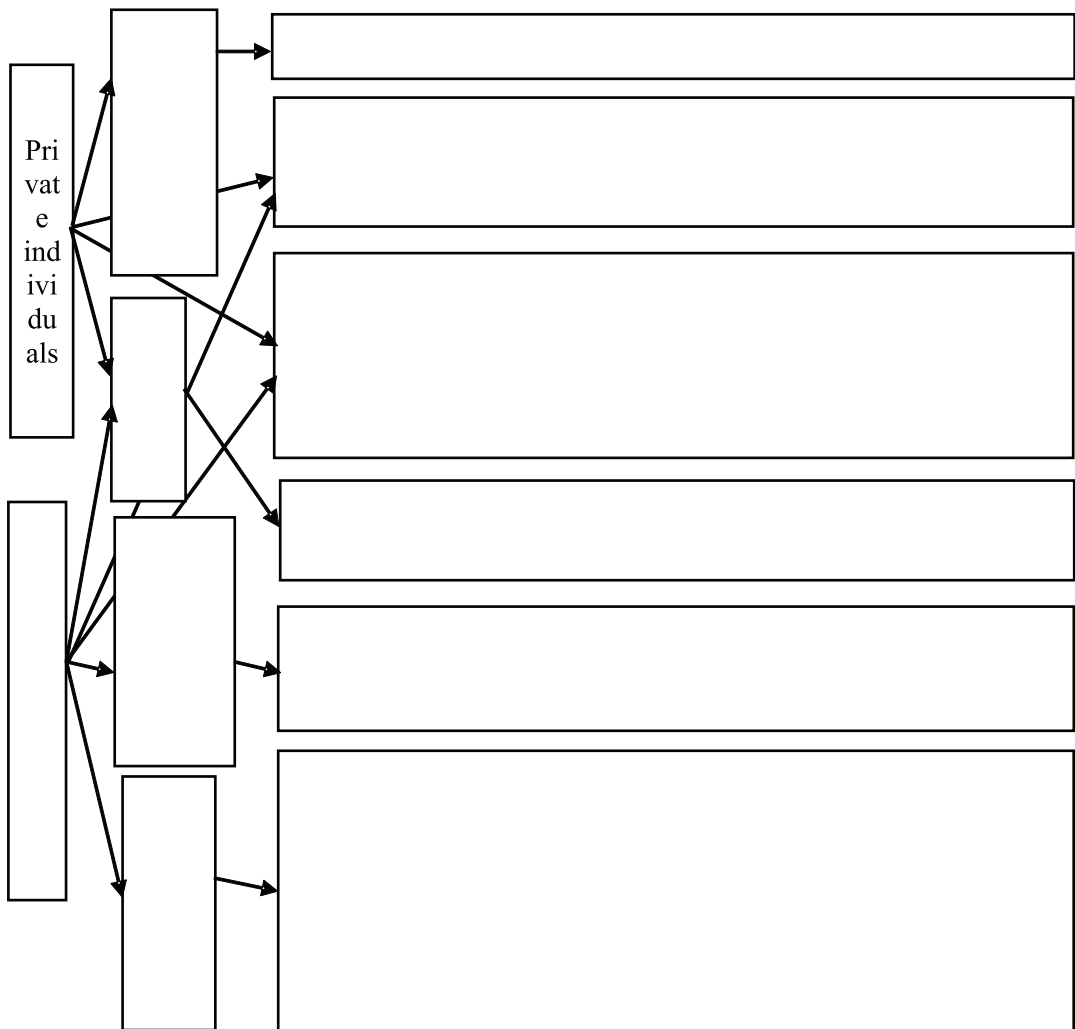


Fig. 3.3. Structure of the national innovation ecosystem

According to Fig. 3.3, the Strategy [261] presents only human resources, and does not take into account their potential and interrelationships, which depend on material resources (assets, financial resources, infrastructure, etc.) and subjective factors, including knowledge, abilities, availability of information, etc.

Therefore, it is proposed that the innovation ecosystem should be presented in terms of three fundamental resources: human resources (their availability and structure, goals, motives), knowledge/information (level of competence, awareness, availability of additional sources of information) and material resources (assets, financial resources, infrastructure). The creation, search, retention, and circulation of these three resources partly characterizes how the innovation ecosystem works and forms the basis of the key challenges faced by stakeholders in the innovation ecosystem. Human resources can be generated in two ways: they can be grown

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by investing in educational infrastructure, or they can be attracted/found in other regions or organizations. Knowledge/information can be divided into explicit and tacit. Explicit knowledge is formulated, codified and structured, from open sources of information, such as scientific articles, textbooks, media articles, blogs and online databases, etc. Tacit knowledge is embedded in people and is a source of contextual information that many stakeholders seek. One of the key challenges for stakeholders is attracting material resources for any activity they undertake. While stakeholders use digital tools to search for potential investors to raise capital, the actual deals and negotiations usually take place through people. Efficient and equitable access to all resources ensures that all stakeholders in the innovation ecosystem get what they need to make their best contribution.

Since the adoption in 2019 of the “Strategy for the Development of the Innovation Sector for the Period up to 2030” [261], it has not been possible to overcome the systemic shortcomings of the domestic innovation ecosystem in the context of promoting progressive structural changes in the economy. In accordance with the Strategy, we will consider the problems of the national innovation ecosystem functioning in terms of attracting a certain source of resources at the appropriate stage of innovation activity (Table 3.8).

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Table 3.8. Problems of the national innovation ecosystem functioning

Stage	Creation of innovations	Transfer of innovations	Implementation of innovation by creating a specialized small innovative enterprise – a startup	Introducing innovations at an existing enterprise, entering mass production
1	2	3	4	5
Material resources		lack of funding	high level of taxes (primarily on labor remuneration and corporate profits)	–
	–	high costs for a newly established company for renting premises and equipment, paying for third-party services (primarily accounting);	high costs for a newly established company for renting premises and equipment, paying for third-party services (primarily accounting);	–
	–	insufficient development of venture capital financing in Ukraine and problems with legal protection of foreign investors' property;	insufficient development of venture capital financing in Ukraine and problems with legal protection of foreign investors' property;	–
Knowledge/Information	lack of necessary information about the market prospects of the proposed idea and knowledge and advisory support for the project from the idea to the commercialization stage	lack of awareness of scientists and employees of units responsible for commercialization in higher education and research institutions regarding the assessment of the level of readiness of scientific and technical development, the subsequent market effect of transferred technologies, the development of a commercial development strategy, and scenarios for technology transfer at different stages of readiness	lack of necessary knowledge and skills for entrepreneurial activity	–

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Continue of table 3.8

1	2	3	4	5
<p>insufficient promotion and dissemination of information about positive examples of turning an idea into an innovative product</p>	<p>lack of information about information partners</p>	<p>absence or limited effectiveness of the innovation infrastructure, which should facilitate the development of innovative entrepreneurship</p>	<p>insufficient awareness of the opportunities for small and medium-sized enterprises to use innovations, high transaction costs for searching and accessing databases, lack of effective channels for transferring information on the demand of enterprises to the science and education sector</p>	<p>–</p>
<p>absence of a mechanism enshrined in the legislation for transferring technologies created or purchased for budgetary funds abroad</p>	<p>–</p>	<p>–</p>	<p>–</p>	<p>–</p>
<p>discrepancies in the regulation of relations in the field of intellectual property between the Civil Code of Ukraine and acts of special legislation of Ukraine regulating this area of relations</p>	<p>–</p>	<p>–</p>	<p>–</p>	<p>–</p>
<p>Human resources</p>	<p>lack of established communications between scientists and business representatives interested in the development of innovations, both to business needs for innovation and data on new and improved technological solutions that can be used in production</p>	<p>low level of interest of higher education institutions in innovation activities</p>	<p>–</p>	<p>insufficient interest of business entities in the implementation of the results of domestic scientific research and scientific and technical (experimental) developments that require additional time and financial resources for their full application</p>

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End of table 3.8

1	2	3	4	5
Human resources	insufficient use of opportunities for participation in international programs by scientists and small and medium-sized businesses	lack of specialists in the field of innovation management, intellectual property management, marketing, legal protection, financial advisors, technology transfer and business planning experts	-	lack of presentation skills of innovators (persons who create new or improve existing competitive technologies, products and/or services), ability to assess the amount of funds they can receive from the enterprise, which bears the main risks during the implementation of innovation
	Lack of reliable forecasting of trends and research on the impact of state regulation instruments for innovative economic development	the complexity of the valuation of intellectual property rights and the lack of specialists to carry it out	burdensome regulation, in particular, complicated access to the labour market for foreigners and an overly complicated process of liquidation of the enterprise, which is extremely important for start-ups, since innovation is a high-risk business and some start-ups fail	lack of independent assessment of the technological level of scientific and technical (experimental) development and the ability to technically implement it
	-	-	-	low level of awareness of innovators in the field of legal protection and protection of intellectual property
	-	-	-	lack of a «common language» between business and science representatives

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This is due to the fact that the structural elements of the national innovation ecosystem and the regulatory framework for their functioning in Ukraine are not built into a single structure, so the results of the activities of these elements are isolated and do not have a synergistic effect, which should be to increase the efficiency of national production.

Based on the grouping (Table 3.8), it can be noted that the problems of material resources availability arise mainly at the stage of transfer and implementation of innovations. The need for knowledge and information is concentrated to a greater extent on the initial stages of innovation. And the challenges of human resources are concentrated throughout the entire innovation process.

With this in mind, the goal of our study is to create a holistic view of stakeholder interaction by conducting a multilateral analysis of motivations, perspectives, needs, and practices in the innovation ecosystem, which includes:

- 1: Identifying the entities that are stakeholders and the impact they have on the innovation ecosystem;
- 2: Formation of indicators, data sources and tools that characterize the interaction of these stakeholders;
- 3: Ranking of mechanisms that can improve stakeholder interaction in decision-making and contribute to the innovation ecosystem.

The concept of “stakeholder” is widely used in management science. It appears in the context of strategic management [96], corporate social responsibility policy [213], and project management [78]. In this study, a stakeholder is defined as an entity (person, group of persons, organization) that is in some way related to the innovation ecosystem, for example, determined by its process or results. The term “stakeholder” also refers to a set of measures that includes the identification and assessment of relationships between entities operating in the organization and its environment. Thus, the key point in identifying stakeholders is to understand their functional characteristics and the vector of their influence on the innovation ecosystem.

The main function of the innovation ecosystem is to ensure network interaction of the structural elements of the innovation economy that provide services according to the network profile (educational, financial, consulting, marketing, information and communication, legal, etc.) in order to distribute resources in various forms, provide organizational, analytical and information services to participants in innovation activities from the business, educational and research sectors through the establishment of sustainable contacts between them and the pooling of resource flows. In the structure of the innovation ecosystem, we propose to distinguish the following functional characteristics of stakeholders (Table 3.9).

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Table 3.9. Functional characteristics of innovation ecosystem stakeholders

Function	Characteristics
Innovative	organizations engaged in innovative activities for the development and production of innovative, scientific, technical and intellectual products
Providing	providing material and raw material resources, communication between all stakeholders of the innovation network, creation and maintenance of an information collection mechanism; legal, marketing, information support, etc.
Financing	organizations that provide financial support for the innovation network, make settlements and distribute cash flows, and use funds for the development of the innovation network

In general, stakeholders can be divided into two concepts according to their position in the decision-making process and vector:

- internal concepts – direct influence;
- macro-environmental concepts – indirect influence.

Researcher [97] identifies three groups of key stakeholders, namely universities, industry (corporations) and government. However, with the development of science and technology, new stakeholders have emerged that are important for innovation ecosystems. It is advisable to identify three key stakeholder subsystems that are crucial for the success of most efforts to create an innovation ecosystem, as well as for the further growth and acceleration of innovative entrepreneurship in the ecosystem, namely the Education, Science and Business subsystems.

The subsystem “Education” is represented mainly by universities, which play a multifaceted role that varies widely across innovation ecosystems and provide a range of different activities and ideas. They provide new research, technical and entrepreneurial education, facilities, talented researchers and students, new science-based ideas, technical and scientific training, entrepreneurial education, and a strong base that can help to become a leading international hub for high technology and innovation, etc.

The contribution of a university to the innovation ecosystem can be different. Universities need to take an active role in creating and defining the future, not just reacting to it. A key factor in a diversified economic approach is the ability to create an ecosystem of continuous learning and innovation. The innovation ecosystem can involve various actors within the university, such as individual faculty and students, research departments, etc. In addition to interacting with different stakeholders within a single university, it can also be critical to interact with multiple universities in an ecosystem, especially when they differ in their comparative advantage in research, their focus on education, or in their interaction with corporations for different purposes.

The subsystem “Science” of the innovation ecosystem component includes scientific institutions and research centers. These include the National Academy

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of Sciences of Ukraine, research centers and business support organizations that provide a range of services to businesses and help establish connections between entrepreneurs, investors and business angels, and organize numerous public events.

The entities of the subsystem “Business” include joint ventures, alliances, joint developments, contract R&D, direct purchases, licensing, investments in universities, business parks/centers/incubators, etc. They are directly involved in the introduction of innovations into production and the sale of innovative products, but lag far behind in the development and implementation of innovations. By improving the efficiency of their innovation activities, they will be able to gain new markets, increase profits, expand production, etc. Companies can increase their value by creating new ideas that can be developed into products, services, and business models.

Enterprises can use different approaches to networked innovation, such as purchasing information from other stakeholder partners or obtaining it through partnerships, alliances or licensing, outsourcing their research and development depending on their willingness to give up a certain amount of secrecy, creating support for non-technological small businesses, or operating as part of a technology park and being focused on high-tech areas, i.e. supporting small innovative businesses in the science and technology sector.

Having identified the three main subsystems of stakeholders in the innovation ecosystem, it is important to identify a number of actors that may be involved in the creation of and play a role in a complex innovation ecosystem. They relate in some way to the three main stakeholder subsystems and can be included in it, depending on the specific circumstances (Table 3.10).

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Table 3.10. Stakeholders of the innovation ecosystem by subsystem category, functional feature and position

Position	Functional feature	Subsystem			
		Education	Scientific	Business	
Concepts of internal state - direct influence	Innovating (I)	Educational institution (I_{IE})	Scientific institution (I_{IS})	Business entity (I_{IB})	
		Employee (I_{ISEB})			
	Financing (F)	Founder/Manager (F_{ISB})		Shareholder (F_{IB1})	
		Student (F_{IE})		Consumer (F_{IB2})	
				Investor / Business angel (F_{IB3})	
	Financial / Credit institution (F_{IESB})				
	Providing (P)	Business association (corporation / consortium / concern) (P_{IB})			
		Science / Innovation park / Technology park / Technopolis (P_{IESB})			
		Coworking, educational and creative hubs (P_{IES})			
			Business park / center / incubator, Science / technology center, Technology transfer center, advisory center (P_{ISB})		
Concepts of the macro environment (external environment) – indirect influence	Innovating (I)	State authorities / Local self-government bodies (I_{EESB})			
				Provider (I_{EB})	
		Partner (I_{EESB1})			
		Government institution / State institution (I_{EESB})			
	Financing (F)		National Research Fund of Ukraine (F_{ES})	Business support funds (F_{EB})	
		Grant Foundation (F_{EES})			
		Charitable Foundation (F_{EESB})			
	Providing (P)	Mass media (P_{EESB1})			
		Public association / organization			
		Non-governmental organization (P_{EESB2})			
		International / Scientific and Technical Alliance (P_{ESB})			
		Cluster, Transnational corporation, Financial / industrial group, international group of companies (P_{EB})			

The proposed categories of stakeholders were divided into the subsystems of “Education”, “Science”, and “Business”, according to their position in the decision-making process for direct or indirect influence and functional characteristics: innovation, financial, and support, respectively. Some categories of stakeholders are associated with the exchange of values, exempting them from financial compensation

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for knowledge, product or service. The analysis of the stakeholder matrix allows to identify areas and new forms of interaction with stakeholders, to identify additional measures to improve efficiency and achieve a state of mutual satisfaction.

Their scale, emergent dynamics, and pathway-dependent nature make them challenging to study and model. Nevertheless, scientists have developed indicators and software to characterize the multifaceted stakeholder dynamics that underlie these ecosystems [324].

However, these theories and empirical indicators do not adequately reflect how stakeholder dynamics play out in practice. The gap between theory and practice is due to the facts:

- most existing metrics and theories were developed by researchers and economists for other researchers and economists [165]. They hardly take into account the needs and experiences of other stakeholders and practitioners in the ecosystem;

- theories characterizing specific interactions between stakeholders are scattered across different disciplines (innovation research, economics, business management, entrepreneurship, etc.), which creates an incoherent body of data on how stakeholders work in innovation ecosystems;

- there is a lack of understanding of how different stakeholders make practical decisions, interacting with each other, using digital data and a variety of digital tools that facilitate interaction between people and information.

An innovation ecosystem is not characterized by a single data source, but rather relies on many disparate, inconsistent, and heterogeneous data sources that are difficult to combine into a single whole [259]. Existing tools for ecosystem analysis include business intelligence tools [96; 213], open-source visualization tools developed by various government organizations and academics [78; 97; 324], and proprietary databases (such as Pitchbook and Crunchbase). While these tools are a starting point, they focus on only one or two aspects of the innovation ecosystem. However, there is no way to combine these indicators into a holistic analysis of the ecosystem. Likewise, maps focused on entrepreneurial and business activity [97; 324], rarely take into account research activity, ignoring a vital part of the ecosystem. Existing ecosystem analysis tools do not reflect the interconnected nature of innovation ecosystems [259]. There is also a need for web-based socio-economic data mapping tools that can simplify research and allow for comparisons of different innovation indicators in different locations [372].

Currently, the development of the innovative economy is hampered by the problems of financing education and science, modernization of the material and technical base of scientific laboratories and institutes, and the problems of training innovative specialists. Undoubtedly, the lag in scientific and technical support of the educational process, its interaction with production, insufficient innovative activity of business in this area, and its low financial capacity have a negative impact.

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In accordance with the CMU Resolution “On the Distribution of State Budget Expenditures among Higher Education Institutions Based on the Performance of Their Educational, Scientific and International Activities” [259] reforms have been carried out in Ukrainian higher education institutions to change the mechanism of financing and management of the university’s organizational structure. Funding for higher education institutions should be formed in accordance with such criteria as the scale of the university, the regional coefficient, the number of students, the amount of funds received by the university from business and international organizations and the indicator of entry into international rankings (The Times Higher Education, QS, ARWU, U-Multirank), and from 2021, such a criterion as the employment of university graduates is additionally taken into account, the university receives funding from the state budget at the level of about 80 % of the previous funding and can receive an additional 15 to 40 % for compliance with the criteria. The criteria should stimulate the development of universities and promote transparency of funding.

In accordance with the methodology for assessing the scientific directions of higher education institutions during the state certification of higher education institutions in terms of their scientific (scientific and technical) activities [259] a system of indicators for assessing the scientific and technical activities of IAU has been formed (Table 3.11).

Table 3.11. The list of relative indicators for assessing the scientific and technical activities of a higher education institution by areas

Indicators	Explanation	Formula
1	2	3
Indicators of HEI staffing by research area		
k_1	Share of PhD dissertations defended by HEI employees per 1 person by research area (research and teaching staff (RTS) + employees of research units, sectors and other research units (hereinafter referred to as RRUs) + postgraduate students)	$k_1 = \frac{R_1}{P_1 + P_4 + P_5}$
k_2	Share of doctoral dissertations defended in a research area per 1 person (research staff + research staff + doctoral students)	$k_2 = \frac{R_2}{P_3 + P_6 + P_8}$
k_3	Specific indicator of the number of young scientists of higher education institutions who are performers of scientific works and scientific and technical (experimental) developments in the scientific field funded by the state budget, per 1 person (young scientists)	$k_3 = \frac{R_3}{P_9}$
k_4	Specific indicator of the number of HEI employees (at the main place of work) who are members of editorial boards of scientific publications (journals) indexed in the Scopus and Web of Science databases per 1 person (academic staff + research and development staff + doctoral students)	$k_4 = \frac{R_4 \cdot 100}{P_1 + P_4 + P_6}$

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End of table 3.11

1	2	3
Indicators of HEI funding by research area		
k_5	Specific indicator of the amount of funds for research and development of higher education institutions in a scientific area, which are funded from the general budget fund based on the results of competitive selection (thousand UAH), per 1 person (research staff + postgraduate students + doctoral students)	$k_5 = \frac{R_5}{P_1 + P_4 + P_5 + P_6}$
k_6	Specific indicator of the amount of funds for research and development of higher education institutions in a scientific area financed from the special fund of the state budget (thousand UAH), per 1 person (research staff + research and development staff + postgraduate students + doctoral students)	$k_6 = \frac{R_6}{P_1 + P_4 + P_5 + P_6}$
k_7	Specific indicator of the book value of equipment purchased or received for long-term use per 1 person (book value as of January 1 of the year following the reporting year) (R&D staff + postgraduate students + doctoral students)	$k_7 = \frac{R_7}{P_1 + P_4 + P_5 + P_6}$
Publication activity		
k_8	Specific indicator of the number of scientific publications (journals), founded (co-founded) by the HEI, in the scientific field, indexed in the Scopus and Web of Science databases, per 1 person (academic staff + research and development staff + postgraduate students + doctoral students)	$k_8 = \frac{R_8 + R_9}{P_1 + P_4 + P_5 + P_6}$
k_9	Specific indicator of the number of publications in professional scientific journals of Ukraine of category B, per 1 person (research staff + research staff + postgraduate students + doctoral students)	$k_9 = \frac{R_{10}}{P_1 + P_4 + P_5 + P_6}$
k_{10}	Specific indicator of the number of publications in foreign periodicals of the Organization for Economic Cooperation and Development per 1 person (research staff + postgraduate students + doctoral students)	$k_{10} = \frac{R_{11}}{P_1 + P_4 + P_5 + P_6}$
k_{11}	Specific indicator of the number of publications in the Scopus and Web of Science databases per 1 person (research staff + research and development staff + postgraduate students + doctoral students)	$k_{11} = \frac{R_{12} + R_{13}}{P_1 + P_4 + P_5 + P_6}$

There are no mechanisms to stimulate the quality of research: the results of state certification do not actually affect the level of funding, and individual salaries of researchers are based on degrees and titles, not on scientific achievements. The distribution of funding among research institutions, which is carried out by the main budget spending units, is non-transparent, based mainly on the “historical” principle and does not depend on scientific achievements.

Most of the funding is basic, and departmental competitions are in fact a substitute for institutional funding in the face of limited resources. Only a small part of the state

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funding for research is spent on research support (equipment, materials), while the bulk is spent on salaries and utilities. New independent state grantors (National Research Foundation of Ukraine, Ukrainian Startup Fund, Presidential Foundation for Support of Education, Science and Sports) so far cover only a small share of the funding needs for various types of research. The status of a budgetary institution imposes significant legal and financial restrictions on research institutions and higher education institutions that prevent them from using funds efficiently and being competitive in the labor market, making cooperation unattractive to private partners.

Important and timely in the context of the current challenges and acceleration of the country's European integration actions and intentions was the adoption by the Cabinet of Ministers of Ukraine of the Resolution "On Approval of the Strategy for the Development of Higher Education in Ukraine for 2022-2032" [258]. The document plans to ensure the effectiveness of management in the higher education system, which involves increasing budget funding and improving the performance-based allocation formula; and expanding budgetary lending for higher education and adult education. The project will finance support for system sustainability and long-term change management; modernization of the higher education information and analytical system; introduction of the National Student Survey, launch and improvement of digital solutions for educational measurement of learning achievements; digital infrastructure for organizing learning in higher education institutions to ensure the continuity of the educational process through distance learning technologies, development and launch of electronic learning management systems.

Strategic planning of the financial development of the innovation economy in the context of interaction between education, science and business stakeholders involves the process of defining goals and priorities, specific values of indicators, and their achievement for a certain period of time, while simultaneously developing appropriate mechanisms and tools for implementation. At the stage of developing a financial strategy, specific measures and tasks should be implemented that determine the general nature of the development of the innovation economy in the context of material resources of interaction between education, science and business stakeholders. At the same time, the final result of development may not be strictly fixed, and the values of the relevant indicators are set in a certain zone with the desired limits in size and time [28].

In our opinion, the following basic principles should be applied to strategic planning of financial development of the innovation economy in the context of interaction between education, science and business stakeholders:

integrity (development of forecasts and measures taking into account the forecasts of other areas of activity);

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objectivity (values of indicators are developed on the basis of state statistical information and the Demographic Forecast of Ukraine);

scientific nature (indicators are developed on the basis of appropriate methodology and international experience, primarily the EHEA);

accessibility (strategies should be accessible to the population, the public, universities, scientific institutions and business).

When choosing a financial strategy, it is advisable to use a matrix of financial strategies, which allows you to choose a promising direction for attracting material resources. Manipulating within this matrix, we can consider the problem in dynamics, making it possible not only to formulate a financial strategy, but also to modify (change) it as a result of changes in some very important parameters. The financial strategy matrix allows not only to determine the current situation in terms of financial risk, but also to consider the situation in dynamics to allow forecasting changes in the financial strategy depending on changes in important performance indicators, as well as planning performance results, purposefully changing these indicators and reducing the level of financial risk. It is a simple tool that can be used in a variety of ways to monitor and evaluate the dependencies of financial capabilities and their effectiveness.

The ultimate goal of the financial strategy is financial sustainability. A financial strategy will facilitate collaboration between organizations, researchers, sectors, and practitioners, helping to unite a previously fragmented financial literacy community that seeks to help make informed financial decisions.

Financial resilience is the ability to adapt or withstand both foreseeable and unforeseeable financial decisions and difficulties. The ability to ensure financial sustainability depends on the individual as well as the environment or ecosystem. It is achieved when a person or group of people has access to appropriate resources and uses their skills, knowledge and confidence to make good financial decisions even in times of financial challenges. Developing financial resilience allows you to reduce the impact of financial adversity and/or take advantage of opportunities to ensure financial efficiency.

When determining the relationship between stakeholders, it is necessary to describe the level of divergence or convergence between goals and expectations.

Measurement “Compatibility” requires determining the vector of influence of the stakeholder on the interaction. It is assumed that in the case of compliance, the direction of influence is positive (support) when it comes to the stakeholder’s expectations regarding the purpose of the interaction. However, in the case of a mismatch, the relationship is negative (conflict).

Measurement “Valuation” dimension is formulated on the basis of pairwise comparisons and the Saaty scale determines the stakeholder’s importance, which is called the global weight (GW).

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Measurement “Action” dimension refers to the willingness to actively influence the interaction and uses a probability scale (P) that indicates the probability intervals defined for each value on the scale (Table 3.12).

Table 3.12. Dimensions of determining the parameters of stakeholder interaction in the formation of financial strategy

Measurement	Description
Compatibility (C)	Comparison of the financial risks of conflict or opportunities for cooperation with the stakeholder
Valuation (V)	Estimating the value of funding or engagement mechanisms through which stakeholders can influence the activity and its outcomes
Action (A)	Mechanisms can be the result of various attributes of influence, such as the availability of financial resources, decision-making authority, participation in project processes, etc., which is embodied in the stakeholder’s propensity to act – the likelihood of action

Given these dimensions of influence, stakeholders can be divided into several groups. The analysis of stakeholder influence on interaction was conducted taking into account the three dimensions presented in Table 3.12. For each of them, it is advisable to define measures and scales of measurement. To summarize the results of stakeholder interaction, it is proposed to use the measurement “Interaction (I)” - an indicator that is measured in relation to the above dimensions, calculated by the formula:

$$I = C \cdot V \cdot A \quad (3.1)$$

The results of the analysis are the starting point for evaluating scenarios of stakeholder interaction. Based on the stakeholder analysis, four main scenarios were identified: Optimistic, Pessimistic and Deterministic. In response to the identified scenarios, three main types of reactions are proposed:

- support – support for allies, encouraging them to participate in the project;
- minimization – weakening opponents, deterring them from negative actions, modifying project goals to meet their expectations;
- acceptance – acceptance of the scenario and refusal to influence the stakeholders.

The development of a financial strategy to ensure the interaction of education, science and business stakeholders will allow the use of innovative approaches to financing and investment using a diverse range of public and private sector capital, including through global and national local partners. The implementation of the financial strategy will allow to align, strengthen, accelerate and access additional funds, financing, support and partnerships, as well as to apply alternative solutions that are necessary to significantly accelerate the progress of innovation.

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To identify the financial needs and practices of stakeholders in the innovation ecosystem, we first examined the motivations, interactions, activities, tools, and resources of stakeholders. Motivations and interactions also determined the different types of activities that stakeholders can undertake.

3.3. A risk-oriented approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy

3.3. Risk-oriented approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy

Relevance. Ensuring the implementation of Industry 4.0 technologies is aimed at increasing productivity and economic growth in the EU. The priority area is production automation in connection with digitalization. The European Commission has been focusing on these changes since 2015, when it was noted that Europe is at the beginning of a digital industrial revolution, with prospects for greater production flexibility and other benefits. The EU supports industrial change through its industrial and financial policies and research and investment in infrastructure. This process affects almost all countries, not only the EU, with Germany, France, and others leading the way.

The aim is to develop theoretical provisions and methodological recommendations for the introduction of a risk-oriented approach in the financial policy of the post-war economy for the development of Industry 4.0.

Objectives:

- to determine the main directions of ensuring the implementation of Industry 4.0 technologies during martial law and in the post-war economy;
- to consider the features of a risk-oriented approach in financial policy for the development of Industry 4.0;
- to outline the prospects for the development of financial policy in comparison with the development of Industry 4.0 in the post-war economy.

1. Ensuring the implementation of Industry 4.0 technologies during martial law and in the post-war economy

In 2016, the European Parliament issued a report on the study of Industry 4.0, its economic and scientific policies, which analyzed the Industry 4.0 initiatives, which encompasses the digitalization of production processes based on devices that are autonomously connected to each other along the value chain, noting the potential of the initiative and the business paradigm shift and the consequences of this transformation. The study assessed the rationale for legal state regulation of this process and outlined measures that can be taken to maximize the benefits and limit the threats of Industry 4.0 [65].

The new EU research and innovation program (2021-2027) Horizon Europe provides a European partnership that aims to accelerate the development and deployment of new innovative solutions in different sectors by mobilizing public and private resources, and to contribute to the objectives of the European Green Deal as a transition to circular Industry 4.0 and strengthening the European Research Area [135].

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The existing legal regulation and research infrastructure tools in the EU certainly have a stimulating effect on the development of Industry 4.0. Further steps to establish the research infrastructure should erase the differences in the level of its development in the EU countries and have a positive impact on Ukraine's integration into this area, for which the European integration legal and organizational prerequisites are being formed [402].

Ukraine's industry should be assessed for its ability to join the EU's accelerated processes to introduce a new stage of Industry 4.0 along with the green economy [401] by ensuring the implementation of Industry 4.0 technologies.

A special platform has been created for active cooperation in the EU [135], where the European Commission has recently proposed the creation of 10 new European partnerships between the European Union, Member States and/or industry. The goal was to accelerate the transition to a green, climate-neutral and digital Europe that has been announced, as well as to make European industry more sustainable and competitive. The EU will invest nearly €10 billion, with partners expected to respond with at least an equivalent amount of investment. This joint contribution is expected to mobilize additional investments to support the transition to circular Industry 4.0 and create long-term positive impacts on employment, the environment and society.

In March 2023, France joined the process, and on the basis of Global Industrie, its international and largest industrial exhibition, Industry 4.0 International Business Meetings 2023 was held, which targets the entire industrial ecosystem (from startup to large customers, including subcontractors, equipment manufacturers, competitiveness clusters, research centers and incubators...), and covers the entire value chain (research and development, design, production, maintenance, services). [134], as well as all user markets, which demonstrates the real steps of the effectiveness of EU solutions to accelerate the transformation of Industry 4.0.

Current cross-country research has shown five homogeneous profiles of Industry 4.0 adoption across industries and European countries, with a strong divide between (and within) European countries and industries. Industry 4.0 is much more industry-driven than country-driven [31], which is the result of European clustering processes.

Another study aims to establish the mediating effect of the introduction of Industry 4.0 technologies on the relationship between work engagement and performance [362]. According to the researchers, despite some interest in Industry 4.0, little is known about the relationship between work engagement and performance in Industry 4.0 companies. Data were collected from 241 employees of large Canadian companies. A structural equation model was used to test the mediating effect of Industry 4.0 and the components of engagement and performance. The results based on this model revealed differences by gender: for men, job engagement was positively related to job performance, and for women, engagement was positively related to

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Industry 4.0. Also, without gender separation, all employees demonstrated a strong relationship between Industry 4.0 and job performance. The difference is that this relationship applies to manufacturing companies, not to the service sector. It was also found that years of work experience influences the mediating effect of Industry 4.0 between engagement and performance, although this was not significant for education level. Such studies contribute to the development of the theory of planned behavior and suggest that managers use current approaches to continuous improvement that are human-centered and compatible with new Industry 4.0 technologies [362].

Based on the analysis of the current legislation, researchers have found that currently, in the context of Industry 4.0, there is not enough legal framework to ensure economic security [293]. From the perspective of digitalization, Industry 4.0 is a key stage in the digital transformation of the national economy of Ukraine and ecosystems of different levels. It has been established that it is advisable to take into account the requirements of Industry 4.0 for the development of the Concept for the Development of the Digital Economy and Society of Ukraine for 2023-2027, which should define the mechanisms for ensuring the economic security of the State in the context of digital transformations. It is also proposed to take into account the prospect of changes in the economy in relation to the requirements and state of Industry 4.0.

All these processes have a certain level of risks for the development of Industry 4.0 technologies, so the application of a risk-oriented approach in financial policy for the provision of services is relevant.

2. Risk-oriented approach in financial policy for the development of Industry 4.0

The issues of a risk-based approach in the financial policy of providing services for the development of Industry 4.0 in the post-war economy require the development of different approaches to analyzing the provision of services for the development of Industry 4.0, taking into account the risk component.

One of the studies [292] considers the defining features of the development of the modern information space and the formation of information technologies, which are the basis of Industry 4.0, in combination with the formation of a risk-oriented financial support system. The researchers believe that the universality of the economic and legal regulations governing the development of the global IT industry is not always inherent in the use of a particular country, which, joining the process of harmonizing its economic and legal regulatory mechanisms in the field of IT with international standards, may consider various groups of measures: in the field of development of information services and information technologies themselves, and in the field of protection and support of producers of Industry 4.0. A risk-oriented approach to financial policy can be aimed at ensuring the implementation of the enterprise's strategy and its sustainable development with integration into business

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processes and management decision-making during martial law and in the post-war economy.

By analogy with the introduction of a risk-based approach in the financial monitoring system, one can use its interpretation, which is applied to specially designated entities [121] that provide certain services that can be effectively implemented in Industry 4.0 enterprises.

The application of a risk-based approach (RBA) is the identification (identification), assessment (reassessment) and understanding of risks, as well as the adoption of appropriate risk management measures in a manner and to the extent that minimize such risks depending on their level [121].

A risk-oriented approach is one of the most important tools for building an effective enterprise development management system, in particular, Industry 4.0. Understanding these risks and related factors allows an Industry 4.0 enterprise to take more effective and efficient measures to prevent the decisive impact of risks on its operations. Risks are dynamic in nature, so risk management should be carried out continuously. It is necessary that the assigned risk levels correspond to the actual risks, reflect the real picture, and represent an effective method of assessment.

Industry 4.0 enterprises and institutions can use different approaches to risk assessment. Scientists [277] note a quantitative, qualitative, semi-quantitative method based on assets, vulnerabilities, or threats, which is more appropriate for financial policy in the provision of services. Each methodology can assess different risk positions of entities, but they all require some adaptation. Quantitative methods are more accurate. The risk assessment can be presented in financial terms that are clear and understandable. A cost-benefit analysis allows decision makers to prioritize mitigation options. Meanwhile, quantitative financial methodology may not be possible, may be difficult to quantify, and there is a growing use of professional judgment that does not contribute to objective assessment. Quantitative methods are mostly complex and require special training, so outsourcing is used whenever possible. The qualitative approach is widely used, but with measurement scales. Professionals (experts) use information to classify risks on different scales, mostly as high, medium or low, which provide an idea of how the risks affect the entity.

Vulnerability-based methodologies expand the scope of risk assessment beyond finance [277]. Combining vulnerability-based risk assessments with a vulnerability management process can contribute to proper risk management. Researchers believe that this approach covers more risks than financial assessment. Other researchers [385] substantiate that in the activities of an engineering enterprise, in particular in design, which is a significant number of enterprises in Industry 4.0, risk management should form an equivalent system for identifying, identifying, assessing and neutralizing relevant risks. The requirements of the international standard ISO 9001:2015 on risk

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design and management focus on their assessment, which allows timely identification of potential threats, analysis of their causes and formation of measures to respond to them. Researchers have proven [385] that an effective means of identifying and assessing design risks is FMEA analysis (FMEA is an acronym for Failure Mode and Effects Analysis, an analysis of failure modes and effects developed in the United States for the military industry).

Expert evaluation allows to identify potential risks in relation to the design process and stakeholders (interested parties) of the engineering enterprise and to identify them through a scale measurement. This can be prompt and essential information for the top management of the engineering enterprise to formulate corrective measures and make management decisions to reduce or eliminate risks in the design process of products and services, which is a means of a risk-based approach in quality management systems to improve performance.

Researchers have demonstrated the peculiarities of applying a risk-based approach in project management using the example of the electronics industry [30]. Identifying and mitigating project risks is a priority in managing effective projects. Researchers have proposed an extension of the failure mode and effects analysis (fmea) format to quantify and analyze project risks. The new methodology is designated as rfmea, a modification of the well-known fmea method for processes, products, and services. The benefits of the approach are increased attention to the most inevitable risks.

To eliminate certain shortcomings of clarity in the use of fmea analysis, an approach to risk analysis through the value of fuzzy similarity is applied [201]. The use of a similarity measure value in fmea to partially order frpn values is new in this particular field.

The failure mode and effects analysis (fmea) technique was originally developed for the systematic analysis of failures and their subsequent consequences for defense products (Bowles & Peláez, 1995), which is relevant for the military and post-war economics of Ukraine. The use of fmea methodology mainly for analyzing the failure mode of products, ranging from nuclear, automotive, chemical and mechanical, can be effective for industry 4.0 technologies in terms of the production chain. Even more relevantly, fmea has been widely used in fault analysis in the software industry (Shawulu, 2012; Stamatis, 1995; Guimarães and Lapa, 2006; Kangari and Riggs, 1989), which adds to the arguments for the potential use of this method in industry 4.0. Given the systematic nature of fmea, which is that the main purpose of applying it is to identify possible failure modes of system components, assess their causes and subsequent impact on system behavior, and, as a result, determine ways to eliminate or reduce the probability of occurrence, it can become the basis of a risk-based

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approach to financial policy formation and service provision for the development of industry 4.0. or the severity or increase in the detection of a particular failure mode.

Industry 4.0 technologies combine the simultaneous combination of the mechanical (production) component and automation using it technologies, therefore, it is possible to apply the traditional calculation of the risk of various failure modes using fmea through the development of a risk priority (rpn), which is defined as the value obtained by the product of three components, i.e., the probability of failure mode occurrence (p), the complexity (severity) of the failure mode (s) and the level of detection of the failure mode (d) [201]. the higher the rpn value, the higher the risk associated with the corresponding failure mode. the purpose of the rpn is to prioritize the failure modes of the industry 4.0 system so that available financial resources can be allocated efficiently. highlighting more risky change processes means that additional financial resources will be required to address the failure modes.

Mathematically, rpn can be represented as the product of risk parameters p, s and d, which can be measured on different scales: the maximum value is 5, 7 or 10 points, which are discrete values, so the value of rpn is measurable by nature, but they may have disadvantages regarding the same level of risk with different combinations of measurement, and the importance of each parameter is not taken into account, for which it is proposed to use fuzzy logic approaches [201].

Risk analysis is a valuable complement to process validation, allowing not only to identify technical risks, but also risks associated with human factors. Failure modes and effects analysis (FMEA) can be applied using a categorical assessment of the risk of occurrence, detection, and severity of failure modes, and a risk priority number (RPN) can be calculated to select failure modes for correction. Scientists have proposed a probabilistic modification of FMEA, replacing the assessment of risk occurrence and detection with an estimated relative frequency and retaining the categorical assessment of severity [19].

The FMEA is a valuable addition to analytical validation. It is modified by replacing the category scores with probabilities. The probabilistic modification of the FMEA may have additional values. The frequency of occurrence of undetected failure modes has been quantified [19]. The first step in performing FMEA prior to analytical analysis is to identify potential failure modes. These failure modes are listed and then evaluated based on three aspects of failure modes: occurrence (O), detection (D), and severity (S). Traditionally, this FMEA evaluation is performed by assigning individual values to each of the elements on a predefined scale, such as 1 to 3, 1 to 5, or 1 to 10. [19].

The categorical scores are ranked in such a way that higher scores are associated with higher risks and the risk is calculated as a risk priority number (RPN), which is the product of the scores of these three parameters. These RPN values allow

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comparing the risks: the failure modes with the highest RPN values are the most relevant for improvement to reduce these risks [19]. There are proposals to modify this approach by changing the categorical assessment of occurrence and detection to a probabilistic assessment of the relative frequency of occurrence ($P(O)$) and detection ($P(D)$) [19]. This approach differs from the approach of other authors in that the severity score (S) could not be changed to another meaningful quantitative measure, so it was kept unchanged [19].

In the practice of a machine-building enterprise, there are peculiarities of conducting FMEA analysis based on the requirements of current regulatory documents [395]. Scientists have proposed the use of the matrix method of FMEA analysis to assess the quality of products and services of machine-building production, which is fundamental to the development of Industry 4.0. The authors present a method for forming quality matrices during product design, production preparation, technological processes, final inspection of the finished product, analysis of environmental factors and conditions [395], which is organizational and technological support for production. To introduce a risk-oriented approach to the provision of services through the formation of a certain financial policy, other tools are needed.

A risk-oriented approach to property management operations for financing construction projects and/or real estate transactions may be considered as an analog [405].

Based on the Methodological Materials on Financial Monitoring for Business Entities Providing Services in the Course of Real Estate Purchase and Sale Transactions, the author identifies the points of compliance of a high-risk client, which is relevant during martial law and corresponds to the concept of developing a risk-based approach based on the main criteria for assessing the client's risk. Taking into account the complexity of such assessment and the need for prompt decision-making, a rating scale for risk criteria was developed for integrated automated determination of the client's risk level and high-risk clients were assessed in the Decision Making Helper software product [58]. The expediency of introducing a risk-based approach to assessing high-risk clients by automating the process of determining their level is associated with a reduction in the time required to make the necessary decision.

It is proposed to partially apply this experience to the development of a risk-based approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy.

Particular attention should be paid to the process of determining the level of risk of a client, in this case, an Industry 4.0 enterprise, especially if it falls into the high-risk zone for financing.

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Given that customer risk assessment is an important component of financial policy, it is proposed to improve it through the use of modern information technologies (Decision Making Helper), which will facilitate timely risk identification.

In accordance with the development directions of Industry 4.0 enterprises, their risk assessment can be carried out according to three main criteria: the type of client (status of the enterprise), the level of industrial automation of production processes, and the level of digitalization of production.

The content of these criteria is quite extensive, and a high-risk customer is determined by the presence of specific requirements. When determining the client's risk group, the general rule is that if a client falls under at least one of the risk criteria, then the risk level of such a client cannot be defined as "low". Another important aspect is the essential characterization of the criteria.

In addition, not only the risk assessment itself is important for managing the financial policy formation process, but also the decision-making in a short time on further interaction with the client. Given that the assessment process, given the possible number of components in each of the criteria, is complex, there is a need to process various information that requires both time and other resources that business entities lack, it is proposed to automate this process and use the Decision Making Helper program [121], which is a decision support system (DSS) or a product that allows automating the determination of the client's risk level according to expert assessment. Recently, the process of possible use of professional judgment has accelerated, so the use of this tool is relevant.

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assessment. Recently, the process of possible use of professional judgment has accelerated, so the use of this tool is relevant.

When choosing the direction of automation of the selection process, a comparison was made with other decision support systems that allow performing optimization tasks of various kinds. The advantage of the Decision Making Helper program is that it can apply weighting coefficients, which allows for prompt changes to the evaluation procedure.

The experience of using this software product to solve problems of choosing the best alternative is positive. To solve this task, the author proposes to use the Decision Making Helper program to determine the level of client risk for financial support of Industry 4.0 enterprises.

Table 3.13 shows the developed rating scale for the client risk assessment criteria for inclusion in the Decision Making Helper program. For this purpose, a rating scale for customer risk assessment criteria has been developed in accordance with the requirements for the formation of software. To enter the scores into the program, it is necessary to determine the level of importance of the criteria for each client according to the required rating. It is proposed to use from (-5) “low level” to (+5) “high level”, 0 – neutral level.

As can be seen from Table 3.13, the greater the number of components according to various criteria related to a particular client, the higher the score. Using a weighted average pairwise comparison (a method built into the Decision Making Helper software to automate the selection process), the client with the highest score is determined – this client is assigned to the lower risk group.

Table 3.13. Example of a rating scale for client risk assessment criteria for the Decision Making Helper program

Criterion for assessing client risk	Components of the criteria (number)	Assessment in the Decision Making Helper program
The level of industrial automation of production processes	4	Either +5 or +4 +3
	3	
	2	Either +1 or +2
	1	From -5 to -1
	0	0
Type of client (company status)	7 – 10	From +1 to +5
	5 – 6	From -5 to -1
	1 – 4	0 / -1
The level of digitalization of production	7 – 10	From +1 to +5
	5 – 6	From -5 to -1
	1 – 4	0/-1

Source: developed by the author.

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The Decision Making Helper program automatically calculates the decision value for each client as a percentage from (–100 %) to (+100 %) and in the expressions “unsatisfactory/rather unsatisfactory/neutral/rather positive/positive”. The author has made an analogy (correspondence) description of the assessment results in the Decision Making Helper program for assessing the client’s risk for financial security purposes and obtained the results presented in Table 3.14.

Table 3.14. Relevance of client risk assessment results to financial provision in the SPRD Decision Making Helper program

Results in the program	Client’s risk level
Unsatisfactory	High
Rather unsatisfactory	
Neutral	Medium
Rather positive	Low
Positive	

Source: developed by the author.

As can be seen from Table 3.14, the process of interpreting (matching) the results is the opposite of the results obtained in the program, which is due to the fact that the identification of the client with the highest risk indicates a negative assessment of the choice of the subject (Industry 4.0 enterprises).

To experiment with the application of the developed risk-oriented approach using the Decision Making Helper program to assess the risk of a client in the financial security system, it is proposed to consider, for example, specific Industry 4.0 enterprises in a particular region with different levels of development of these technologies.

The level of risk in the economic sphere is influenced by court decisions on violations in business activities. Based on data sources from the Register of Court Decisions for 2022, the researchers provide generalized analytical data [349].

The economic articles were studied. The author singled out those articles of the Criminal Code of Ukraine from this study that may have a connection or impact on the areas of economic activity of Industry 4.0 enterprises: court statistics – (annual reports on the administration of justice by local and appellate courts) for 2022 and statistics from the Prosecutor General’s Office showed that the following articles of the Criminal Code are in the effective part of the verdicts 200 – illegal actions with transfer documents, payment cards, electronic money; 205-1 – forgery of documents for registration of a company or individual entrepreneur; 206 – counteraction to legitimate business activities; 212 – tax evasion; 212-1 – evasion of unified social tax; 219 – bringing to bankruptcy; 220-2 – falsification of financial documents and

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reports; 222 – fraud with financial resources; 222-1 – manipulation in organized markets; 223-1 – forgery of documents submitted for registration of securities issue; 229 – illegal use of TM; 231 – commercial espionage; 232 – disclosure of trade secrets; 232-1 – illegal use of insider information; 233 – illegal privatization.

Thus, from this list, only a few potential risks can be identified that may be inherent in Industry 4.0 enterprises, taking into account their technological features, and therefore these enterprises should not have high risks in terms of their financial support.

The issues of efficiency, effectiveness and risk mitigation of business processes are a priority for Industry 4.0 enterprises, and it is extremely important to address the problem of a fundamental change in the system of development, formation, distribution and use of financial resources of the enterprise [158]. According to the researchers, it is of great importance to reduce costs associated with non-core activities, so the digitalization of production should be provided by outsourcing companies. This is because non-core assets can absorb financial resources. Industry 4.0 enterprises are characterized by the introduction of business “profiling” technology, in particular, in the technological sphere through the automation of production processes.

Given that risk is a mandatory component of managing business processes in the production and economic system of Industry 4.0, tools to minimize negative consequences are needed. As noted in the context of the need to optimize management and consider development scenarios, elements of automation of these processes can also be used. Namely, there is an immediate need to develop a set of active scenarios for the development of the enterprise, which can be used to predict and manage risks. The advantage of using this approach is a high degree of diversity in the choice of management decisions that do not depend on other business entities. To do this, you can use a matrix of distribution of zones of action of various forms of scenarios depending on the state of business processes and the level of risk [158].

It is proposed to apply a risk level scale: low, medium, and high, and three states of business processes: disorganized, acceptable, and sustainable. Depending on the combination of these components, there can be 9 different scenarios for the development of an Industry 4.0 enterprise. Table 3.15 shows the possible directions of a risk-based approach to risk control.

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Table 3.15. Risk-based approach to optimizing business processes of Industry 4.0 enterprises

Risk level	Component of the business process	State of the business process		
		disorganized	acceptable	sustainable
1	2	3	4	5
Low	Core business process	Risk prevention	Prevention and diversification	Diversification
	Infrastructure business process	Risk prevention	Insurance	Outsourcing
Medium	Core business process	Identification of risks	Evaluation	Revaluation
	Infrastructure business process	Prevention of risk	Insurance	Outsourcing
High	Main business process	Prevention of risk	Revaluation	Diversification
	Infrastructure business process	Counteracting, limiting the risk	Outsourcing	Insurance

Source: developed by the author.

As can be seen from Table 3.15, the possible recommendations for applying a risk-based approach to reduce and control risks, eliminate and prevent them are presented, each enterprise independently determines the list of measures to be used depending on the type and condition of the enterprise and the level and state of automation and digitalization of production. This approach takes into account risk management through the state of business processes.

The goal of developing a risk-based approach is to optimize the use of resources for technological processes of Industry 4.0 enterprises, increase the efficiency and effectiveness of innovations, and rationalize the internal procedures of business processes.

The risk-based approach can be applied at the state level to supervise and regulate the implementation of Industry 4.0 technological processes, at the level of business entities. When applying the risk-based approach, Industry 4.0 entities should have procedures for identifying, assessing, monitoring, and managing the risks of innovation in all business processes.

The general principle of the risk-based approach (risk-oriented approach) is that in case of identification of increased risks, management and supervisors should introduce for Industry 4.0 entities enhanced measures to manage and mitigate these risks, and, accordingly, if lower risks are identified, simplified measures or disregard of these risks or limited control are allowed.

The risk-based approach includes the development of risk assessment scales. The components of the risk-based approach may include risk assessment at the national level and the application of risk-based supervision. Risk-oriented principle when building outsourcing systems for Industry 4.0 entities, as well as a risk-oriented

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approach when identifying risky innovations. To develop this approach for Industry 4.0 entities, it is proposed to use as an analog the criteria by which the degree of risk from conducting economic activities in the field of higher education is assessed [241]. For the subjects of Industry 4.0, the risks of negative consequences from the implementation of innovative activities in the field of automation and digitalization can be calculated. Table 3.16 presents a fragment of control over the risk of negative consequences from the implementation of innovation activities.

Table 3.16. Risk-oriented management of innovation activities of Industry 4.0 enterprises (excerpt)

Objectives of risk-based management, supervision and control	The risk of negative consequences from the implementation of innovative activities on Industry 4.0 technologies		Criteria for assessing the degree of risk from digital transformation
	An event with a risk of negative consequences, including digital transformation	The presence of a negative consequence	
Minimize the impact of risks	Sluggish power outages	Type of Industry 4.0 entity	Type of Industry 4.0 entity

Source: developed by the author.

As can be seen from Table 3.16, risk management requires the allocation of components according to the above criteria. The objectives of risk-based management, supervision and control can be graded according to the evaluation criteria. The next step is to develop scales, a fragment of which is presented in Table 3.17.

Table 3.17. Fragment of the risk assessment scale according to the selected criteria

Criteria for assessing the degree of risk from digital transformation	Indicators of the criteria	Number of points
Type of Industry 4.0 entity	Organizational and legal form of ownership	1–5

Source: developed by the author.

As can be seen in Table 3.17, the scale is formed according to certain criteria depending on the level of digital transformation. An Industry 4.0 entity is recommended to apply a risk-based approach in its activities, taking into account the relevant risk criteria, in particular those related to its business processes. The risk-based approach should be proportionate to the nature and scale of the Industry 4.0 entity's activities, which should assess/reassess the risks, including those inherent in its automation and

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digitalization activities, document their results, and keep up-to-date information on the assessment of risks inherent in its activities (risk profile of the Industry 4.0 entity) in such a way as to be able to demonstrate its understanding of the risks.

When assessing risks, an Industry 4.0 entity should consider all material risk factors before determining the level of overall risk and the appropriate level of mitigation measures. It may classify measures depending on the type and level of risk for different risk factors (e.g., in a particular situation), and may apply standard or enhanced measures to analyze business processes to identify risks.

The introduction of a risk-based approach will facilitate access to innovation and digital transformation for Industry 4.0 entities; simplify low-risk activities and free up resources to focus on the highest risk areas.

3. Prospects for the development of financial policy and Industry 4.0 in the post-war economy

According to the Resolution of the Cabinet of Ministers of Ukraine No. 179 of March 3, 2021 [222], Industry 4.0 technologies are defined as an implementation tool in accordance with one of the strategic goals of the National Economic Strategy until 2030 to create new production capacities by stimulating the innovative activities of enterprises in all regions of the country using the competitive advantages of each of them. To fulfill it, tasks have been developed to introduce the technological approach of Industry 4.0 [250] and its individual elements, which are aimed at increasing the competitiveness of industrial enterprises in international markets. Thus, the development of Industry 4.0 is a strategic task of industrial policy, which should be further actualized in the post-war economy.

On July 4, 2023, the 1st All-Ukrainian Conference “Industry 5.0” was held in Kyiv, organized by the Association of Industrial Automation Enterprises of Ukraine and supported by the Ukrainian Cluster Alliance, which adopted a resolution [307]. The event was held within the framework of the Swiss-Ukrainian project “Strengthening MSMEs’ Member Business Associations in Ukraine (Phase II)”, implemented by the United Nations Development Program in Ukraine (UNDP) in cooperation with the Ministry of Economy of Ukraine and with the support of the Swiss government. The signed Manifesto on Ukraine’s Transition to Industry 5.0 is a fundamental and guiding document for the further development of Ukraine’s manufacturing and high-tech sectors in industry, energy, infrastructure and logistics. Its provisions on Industry 5.0 governance and circular economy are aimed at all real sectors of the economy.

The organizational support for the transition to Industry 5.0 is not a gradual movement from Industry 3.0 to Industry 5.0, but a complete change in the industrial paradigm of industrialists to policy makers at various levels, where the principles of

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sustainable development, stress resistance of value chains and ecosystems, focus on the needs of society, circular economy, and fair distribution of labor results begin to dominate the basis of decisions. The main feature of the process is that technology is only a tool for achieving sustainable development goals.

Ukraine has great potential for transition to Industry 5.0 due to the presence of certain innovative factors that should be developed. The biggest problem is the weakness of state institutions, which do not facilitate the transition of industrialists from the dominant Industry 3.0 paradigm. The European direction of development is enshrined in commitments to actually implement relevant industrial, innovation, digital and other policy instruments, including financial policies, and to develop their implementation using a risk-based approach.

Martial law has widened the gaps between domestic innovators and industrialists, despite the challenges of urgent weapons production. The conference participants stated how government recovery programs will integrate participants in innovation ecosystems into large projects, and I welcome the creation of the first accelerators in the defense industry.

The Polish experience and its platforms for the industry of the future are positive [279]. We need to develop innovation ecosystems, industry accelerators, prototyping centers, high-quality analytics, etc. However, the conference participants paid little attention to the elements of financial policy and financing for the development of enterprises not only in Industry 4.0 but also in Industry 5.0.

Over the past year, the NGO “Institute for Economic Research and Policy Consulting” has been conducting monthly surveys of business representatives during the war [225], which include a special part on the impact of the war on enterprises and the problems of doing business during the war. In the June 2023 survey [225], the main problem for business related to a full-scale Russian invasion was the rise in prices for raw materials and supplies. This problem has been at the top of the list for four consecutive months in 2023. In June 2023, the absolute value of this obstacle increased slightly compared to the previous month: 63 % of surveyed enterprises faced price increases, compared to 59 % in May. The second place in the ranking of obstacles was taken by difficulties with the transportation of raw materials or goods through the territory of Ukraine. This problem affected 43 % of surveyed enterprises.

The problem of declining demand for products or services is gradually becoming more and more relevant in 2023. While in January it was mentioned by 32 % of respondents, in June this share gradually increased to 38 %. As in the previous month, the problem of low demand ranked third in the rating of obstacles.

The supply of utilities is unstable. Up to 30 % of businesses face disconnections and interruptions in electricity, water, and heat supply.

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In June, the problem of labor shortages due to conscription or departure of employees became more acute, and almost 40 % of businesses are concerned about it.

In June 2023, the sixth place in the ranking of obstacles to business related to the full-scale Russian invasion was taken by the problem of supply chain disruption. It increased from 30 % in May to 35 % in June.

The list of problems was followed by direct risks, such as the danger to work related to the war.

Lack of working capital and fuel are also among the problems. The importance of these two problems has increased compared to May.

On a positive and encouraging note, 4 % of businesses surveyed in June 2023 said they had not faced any problems.

For Industry 4.0, it is important to analyze the problems in the industrial sector. These risks are distributed to varying degrees across industries. As for the construction materials industry, the risks associated with the transportation of raw materials or goods through the territory of Ukraine are the most frequently mentioned (59 %). For the machine building industry, which is most closely related to Industry 4.0, delays in the supply of electricity, water, and heat, and labor shortages were more pronounced than in other industries, requiring the development of green technologies. As for the assessment of the financial and economic situation at enterprises, this issue was not in the focus of the survey, but will be in the future. The current part is based on the methodology of market surveys harmonized in accordance with the requirements of the Joint Harmonized EU Program of Business and Consumer Surveys (BCS) [225].

Scholars believe [420] that a post-war economic boom in Ukraine is possible with the implementation of state economic policy measures aimed at deregulating the economy and creating a favorable investment climate. The main priority of such a strategy is a balanced financial policy that should be aimed at financing defense programs and developing the military-industrial complex. This indicates that Industry 4.0 technologies should be implemented.

To assess the level of interest in the topic of financial policy in the context of the development of Industry 4.0 enterprises, the search resource Google Trends [127] was used, which is an online tool that allows the use of an immeasurable array of data containing information about the demand for any request or phenomenon in a given point of the planet at a given time interval. The search service provides information on the dynamics of the number of queries, trends in consumer demand in time and region. Using this tool, you can collect information to make decisions in production activities.

Numerical values for a certain time interval or geographic location are calculated according to the following rules: the relative ranking of a particular keyword (term, topic) is determined as a share of the total number of all search queries in a given

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territory for a certain time interval. The obtained rankings are ranked in ascending or descending order using a 100-point scale that reflects the demand for the topic in comparison with queries on any other topics.

Table 3.18 shows the level of interest in the topic of financial policy and Industry 4.0 in Ukraine in different time periods (as of August 01, 2023).

Table 3.18. Level of interest in the topic of financial policy with Industry 4.0 over the last year

Country	Average level of interest in the topic «financial policy»	Average level of interest in the topic of Industry 4.0	Priority region
Ukraine	26	1	Kyiv

Source: developed by the author.

As can be seen from Table 3.18, the level of interest in these topics related to financial policy and Industry 4.0 is not high, which also affected the possibility of obtaining a regional distribution, with Kyiv being the priority and the only region, which indicates large reserves for increasing interest in these topics in the future.

For comparison, the level of interest in these topics in the world in English is considered (Table 3.19).

Table 3.19. The level of interest in the topic of financial policy with Industry 4.0 by English-speaking Google users over the past year

Country	Average level of interest in the topic «financial policy»	Average level of interest in the topic of Industry 4.0	Priority region
All over the world	69	52	Ethiopia, USA, Kenya
	Correlation between topics		
Ethiopia	99	1	Not statistically determined
United States of America	87	13	Delaware, New York
Kenya	82	18	Lagos

Source: developed by the author.

As can be seen from Table 3.19, financial policy and Industry 4.0 topics were in high demand worldwide over the past year, and the trend of their movement during the year was almost the same, with demand falling slightly in the last week of 2022, and even interest in Industry 4.0 surpassing financial policy (38:36). Thus, this indicates the relevance of the topics in question in the world. Among the leaders are the United States and African countries, which may have recently been looking

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for promising areas of change in these countries. Statistically significant are 47 regions of the world, so these areas have their own stakeholders. Ukraine has taken the direction of European integration, so the experience of the Polish economy, as the closest to Ukraine, should be studied, and such a good example is the Polish productivity strategy until 2030, which sets a goal of increasing the efficiency of managing all resources, which will be achieved through solutions based on two basic concepts: circular economy and Industry 4.0 [356].

Thus, to a large extent, it is the issue of both the green economy and Industry 4.0 in their combination that is becoming relevant. The key is a systematic approach to all resources (renewable and non-renewable) and their perception in terms of mutual relations (resource nexus). The strategy proposes to abandon the isolated consideration of the role of individual raw materials (e.g., fuel, water, land) in the economy and focus on their mutual influence on each other (e.g., in a post-war economy, all types of resources will need to be restored simultaneously).

As already noted, the National Economic Strategy until 2030, according to the Resolution of the Cabinet of Ministers of Ukraine No. 179 of March 3, 2021 [222], defines one of the strategic goals of creating new production capacities by stimulating the innovative activities of enterprises in all regions of the country using the competitive advantages of each of them as an implementation tool - Industry 4.0 technologies, which fully meets the objectives of European integration and requires improvement.

To improve the competitiveness of industrial enterprises in international markets that are more advanced in terms of Industry 4.0, there is a separate CMU Resolution on the tasks of implementing the Industry 4.0 technological approach [250] and its individual elements.

Starting in 2023, the metaverse should become a priority for technological innovation and investment as part of Industry 4.0. It continues to be defined as the main online platform used by augmented and virtual reality technologies that allow users to communicate, work, play or shop virtually [367].

For the various platforms of the meta-universe, the technology industry will focus on standards to ensure that there are rules in place that will allow interoperability and interconnectivity. There will be a focus on creating products for industry and corporate clients, such as virtual center advertising, digital twins, and new types of education and training services, which is very relevant for both HEIs and other non-formal education stakeholders [404].

The EU's influence lies in its position as a global technology regulator. The EU Digital Markets Act [83], which aims to create gatekeepers for the largest tech companies with specific obligations to increase competition, reached agreement in March 2022, which is an important component of the regulation of large digital platforms.

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Other rules centered on data and artificial intelligence may also become law in the near future, strengthening the Data Transfer Agreements: The US-EU Data Transfer Agreement of March 2022 will be ratified in 2023, providing a new legal framework for transatlantic data flows [367]. Such changes will facilitate Ukraine's integration into the zone of leaders.

Given the great importance of the agricultural market in Ukraine, the adoption of Industry 4.0 technologies creates new opportunities in agriculture, giving rise to the AgTech phenomenon [14]. However, the rate of adoption varies depending on the characteristics of farmers and the relationship between them and the group of ecosystem stakeholders associated with innovation. It is innovative to study the early adoption of Industry 4.0 technologies in the agricultural sector and identify the main drivers and obstacles in this process. For example, a phenomenological study was conducted on the introduction and dissemination of new technologies in Argentina, which concluded that different modes of connections between innovation actors were established. There is an institutional density that encourages early adoption of technologies, which enables public policy makers to develop strategies, including financial ones, and to combine efforts between the public and private sectors, to dynamize the ecosystem. The focus is on applying technologies that meet the real needs of the industry and the region to make their impact proven and create a spillover effect among those who are underutilized [14].

Institutionalization of Industry 4.0 through synchronization of the strategy of involving industrial companies in the implementation of the Industry 4.0 concept at the expense of EU funds is envisaged in the national strategic objectives of Ukraine until 2030 [222].

The active promotion of Industry 4.0 components, taking into account new tools, is a topical issue of European integration influence.

The peculiarities of the EU's current innovation policy in the context of its focus on sustainable European development in terms of their impact on the innovative development of countries around the world were identified by scientists and the parameters of the national innovation ecosystems of EU member states with different innovation potential compared to Ukraine were assessed. Depending on the level of productivity and innovation potential of national innovation ecosystems, it is assumed [170] that the parameters affecting the innovation activities of the EU and Ukraine in the global context will change. European parameters for the development of the national innovation ecosystem are important for setting benchmarks for the recovery of Ukraine's post-war economy [404].

To accelerate the development of not only Industry 4.0 technologies, but also circular Industry 4.0 and Industry 5.0, as discussed earlier, changes in network-based innovation development are at the heart of cluster initiatives considered promising in the National Economic Strategy until 2030 [222].

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To identify topical issues of Industry 4.0 development in the context of European integration and the post-war economy, the Google Trends search service [127] was used to assess the level of demand for certain topics in the time and regional dimensions. The search for topics of European integration and the post-war economy took place over the past year as of 05/15/2023 in Ukraine [404].

The greatest interest of the two topics identified was in European integration: 20 on a scale of 100, while only 10 regions are statistically significant in this area, the first being Chernivtsi region. The topics of the post-war economy are statistically insignificant, which requires some informational work to increase the level of interest in order to create awareness of the standards and conditions of EU membership.

Conclusions. The study found that the current issues of the formation and development of Industry 4.0 in Ukraine in the context of European integration of the post-war economy require deeper attention and information work.

It is advisable to take into account the requirements of Industry 4.0 to determine the mechanism for ensuring the economic security of the state in the context of digital transformations and to take into account the prospect of changes in the economy in relation to the requirements and status of Industry 4.0.

When assessing risks, an Industry 4.0 entity should take into account all significant risk factors to determine the level of overall risk and develop measures to minimize it, which can be classified depending on the type and level of risk for different risk factors.

The introduction of a risk-based approach will facilitate access to innovation and digital transformation for Industry 4.0 entities; simplify low-risk activities and free up resources to focus on the areas of greatest risk in financial policy.

An urgent issue for Ukraine is the early introduction of Industry 4.0 technologies in the agricultural sector to restore the benefits of agriculture after martial law.

Significant changes in the impact of martial law on the economy of not only Ukraine but also the EU as a restrictive factor in economic activity require the development of additional criteria for assessing the level of ability to develop new Industry 4.0 technologies in its future interaction with the circular economy.

The purpose of the research on the development of theoretical provisions and methodological recommendations for the introduction of a risk-oriented approach for the development of Industry 4.0 in the financial policy of the post-war economy was achieved by solving the tasks of determining the main directions of ensuring the implementation of Industry 4.0 technologies and considering the features of the application of the risk-oriented approach. The study identifies the prospects for the development of Industry 4.0 of the post-war economy with the transition to the “green” component and Industry 5.0.

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Ukraine should join the new EU research and innovation program (2021-2027) Horizon Europe to ensure the European partnership with the acceleration of integration into the European industrial and research space.

The presented areas of using a risk-oriented approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy can be effectively used for the further development of various approaches to the analysis of providing services for the development of Industry 4.0, taking into account the risk component. Understanding the composition of risks and factors related to them enables the subjects of the Industry 4.0 ecosystem to take more effective and efficient measures in order to prevent the decisive impact of risks on their activities. A risk-oriented approach is one of the priority tools for building an effective system of managing the development of enterprises and forming the supervisory functions of the state.

Determining the level of risk, especially with regard to financing directions in conditions of limited activity, is necessary to speed up decision-making processes and save resources. The applied approach to the ranking of risk criteria in the Decision Making Helper software product of the decision support system proved that the search for alternative directions for finding solutions is expedient due to the automation of the process of determining the level of risk, which is associated with a reduction in the time for its adoption.

The experience of using this software product for the purpose of solving the tasks of choosing the best alternative in conditions of risk is positive.

For the possible actions of other researchers, it is proposed to conduct calculation experiments using the developed risk-oriented approach using the Decision Making Helper program to assess the client's risk in the financial support system for specific Industry 4.0 enterprises in a certain region.

It was noted that the risk-oriented approach can be applied at all levels of state regulation for the introduction of Industry 4.0 technological processes. When using it, subjects of Industry 4.0 must have procedures for identifying, evaluating, monitoring, and managing the risks of innovative activity in all business processes.

Ukraine has a great potential for the development of not only Industry 4.0, but also the transition to Industry 5.0 due to the presence of certain innovative factors, but a certain risk has arisen due to the state of war of disruption of supply chains, which, however, according to the business survey, are not decisive for the overall risk.

To assess the level of interest in the topic of financial policy in the context of the development of Industry 4.0 enterprises, the online tool [Google Trends] was used, the use of which opens the possibility to obtain information about the dynamics of the number of requests, trends in the features of consumer demand in temporal

3.3. A risk-oriented approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy

and regional terms, which showed low demand for this topic, but it is revving up towards the end of 2023, which should be used to strengthen measures to stimulate the introduction of industrial innovations at the state level.

The study proposes to apply existing experience in various fields to the development of a risk-oriented approach in the financial policy of providing services for the development of Industry 4.0 of the post-war economy.

Prepared within the framework of the fundamental topics “Legal regulation of economic activity in the conditions of the development of the economy of Industry 4.0” No. 0120u104783, 2023 and “Ensuring innovative development of export-import activities of economic entities of the state sector of the economy in the conditions of a military and post-war state” (state registration no. 0123U102012), 2023.

PART 4.
ANTI-CRISIS FINANCIAL POLICY
IN THE CONTEXT OF GLOBAL EXPERIENCE

4.1. The latest global practices of tax policy in the energy sector and prospects for Ukraine

Energy conservation and energy efficiency have traditionally been and remain one of the priorities of state economic policy. The relevance of energy issues in the state regulation of the economy is historically determined by such circumstances as the limitation of traditional fuel and energy resources and their rather high cost. At the same time, in today's conditions, the importance of an active state policy in the energy sector is significantly strengthened due to the need to minimize the negative anthropogenic impact on the surrounding natural environment in the context of ensuring the goals of sustainable development. In addition, the existing specificity of state economic policy, especially in the EU member states, is also explained by the consequences of the war waged by the Russian Federation against Ukraine.

Taking into account the place of tax policy in the arsenal of levers of state regulation of the economy, since the middle of the last century, world practice has used a sufficiently diverse and extensive tax toolkit aimed at solving existing problems in the energy sector. However, the specificity of the structure and energy security of national economies in the face of new energy challenges forces governments to take a new approach to the use of traditional tools of tax regulation, modification and creation of new tools.

The energy crisis of 2022–2023, which is still far from over, has a particularly strong impact on European countries, so the object of research in this publication is, first of all, the best tax practices of EU countries in the energy sector. This approach is also justified by the prospects of Ukraine's European integration and the need to harmonize Ukrainian and European tax policy, as well as economic policy in the energy sector.

The subject of the study is the latest instruments of tax policy in the energy sector, which are used in the world, and primarily in European practice in 2022–2023 or accepted for implementation in the near future. These tools can be divided into three groups:

- 1) anti-crisis tools aimed at countering the consequences of the energy crisis, curbing energy prices, ensuring their availability and compensating consumers for excessive losses;
- 2) a toolkit for stimulating energy saving, energy efficiency and the use of renewable energy sources;
- 3) temporary solidarity contributions introduced to redistribute windfall profits of energy sector companies as a result of rising energy prices;

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1. Anti-crisis tools aimed at counteracting the consequences of the energy crisis

The first group of instruments is directly related to countering the consequences of the energy crisis, which was most pronounced in Europe in connection with the full-scale aggression of the Russian Federation against Ukraine.

The specific instruments of the state anti-crisis tax policy in the researched area and the taxes in the structure of which they are embedded are determined by the set goals of tax regulation (Table 4.1).

Table 4.1 Toolkit of tax policy in the field of combating the consequences of the energy crisis

Taxes	Toolkit	Country
1. Resistance to the increase in energy prices and inflationary processes		
VAT	Using a reduced rate	Croatia, Germany, Lithuania, Bulgaria, Belgium, Slovenia, Portugal, Ireland, Barbados
	Using an ultra-low rate	Italy
	Zero rate	Montenegro, Botswana
	Exemption from taxation	Montenegro, Kenya
	Seasonal VAT reimbursement scheme for energy suppliers	Lithuania
Excise tax	Reduced rate	Italy, Estonia, Belgium, Ireland, Czech Republic
	Zero rate	Bulgaria, Guyana
Energy and environmental taxes	Reduction of electricity tax rates	Norway, Denmark
	Reduced tax rates on gasoline	Portugal, Canada
	Reduced CO2 tax rates	Portugal
Import duties and taxes	Preferential or preferential tariff, duty exemption	San Marino
Other specific taxes	Temporary application of the zero rate of social security contributions and contributions for intervention in the economic sphere	Brazil
2. Ensuring affordability of household energy equipment		
VAT	Application of a reduced rate when carrying out transactions for the supply of energy devices	Croatia
3. Partial compensation of losses of industrial consumers of energy resources		
Corporate income tax	Tax credit for compensation of costs incurred for consumed energy	Italy
4. Tax support for the most vulnerable sections of the population		
Individual income tax	Exemption from taxation of inflation allowance paid by employers to hired workers	Germany
	Tax credit for payment of electricity	Finland, Turkey
	Increase in the tax-free minimum income (standard tax deduction)	Spain, USA, Portugal, other countries

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End of table 4.1

	Exemption from taxation of compensation for household consumption of energy resources	Ireland
	Revision of the limits of the ranges of the progressive scales of the individual income tax	Portugal, Austria
	Lower tax rates for taxpayers with low incomes	Malaysia

Among the traditional tools for tax countermeasures against crisis phenomena in the energy sector in the EU countries, which will be actively used starting in 2022, the tools built into the structure of VAT should be noted first of all. Despite the fact that preferential taxation of energy resources is not provided for by Council Directive 2006/112/EC of November 28, 2006 “On the common system of value added tax” [41], at the beginning of 2022, the Temporary crisis framework of state aid measures to support the economy in connection with Russia’s aggression against Ukraine was adopted [368], which significantly expanded the possibilities of the preferential policy of the EU member states in the field of indirect taxation.

The most common tax benefits aimed at reducing prices are value-added tax instruments, and among them – the application of a reduced tax rate on transactions with energy resources.

The mechanism of action of such a benefit is that the reduction of tax payments enables the supplier to reduce the retail prices of energy resources at an unchanged level of profits. However, to ensure the effectiveness of such a benefit, state (or municipal) control of real price reduction is important, which does not allow the supplier to artificially increase its own profits while maintaining or disproportionately reducing the price of the energy resource.

Reduced VAT rates as a temporary measure were applied in many EU countries.

Thus, in 2022, a reduced VAT rate for the supply of natural gas, centralized heating, supply of firewood, pellets, briquettes and wood chips was introduced in **Croatia** [351] as a temporary measure valid until March 31, 2023, but due to ongoing inflation and high energy prices, this preference is currently extended until March 31, 2024. The reduced VAT rate is 5 % instead of the general 13 percent VAT rate.

From October 1, 2022, a temporary reduction in the VAT rate on natural gas was introduced in **Germany** - instead of the standard rate of 19 %, a reduced rate of 7 % will be applied until April 1, 2024 [273]. The announced purpose of this measure is to provide compensation to consumers in light of the sharp rise in energy prices.

In **Lithuania**, a reduced VAT rate (5 instead of 21 %) is applied, as in Germany, exclusively to gas, but on the condition that it is used for heating purposes [191].

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A reduced VAT rate of 9 % (instead of the standard rate of 20 %) is temporarily, from July 9, 2022 to July 1, 2023, applied in **Bulgaria** to operations for the supply of central heating services and the supply of natural gas [166].

In **Belgium**, the application of a reduced rate of VAT on the supply of electricity, natural gas used as heating fuel, and heat supplied through heating networks for non-commercial use is transferred from the regime of a temporary measure (which was introduced in 2022) to a permanent basis [329]. Along with setting a VAT rate of 6 %, taxable persons carrying out the listed transactions are entitled to an automatic monthly refund if the difference between the amount of input VAT refundable to the taxable person and the amount of VAT payable by the company, provided that that the amount of such compensation is at least 50 euros.

The reduced VAT rate (9.5 %) on transactions with energy carriers in **Slovenia**, which expired on May 31, 2023, has been extended until December 31, 2023 [266]. The benefit is provided for energy carriers such as electricity, natural gas, central heating and firewood.

The reduced rate of VAT in **Portugal**, which was introduced in May 2023 for gasoline, dyed and labeled diesel fuel, fuel oil and blends [9], equal to 13 %, at the same time the corresponding taxes on fuel consumption were also reduced.

In February 2023, **Ireland** introduced an additional package of measures aimed at supporting households and businesses struggling with high inflation and energy costs [111]. As part of this package, the continuation of the temporary reduction of VAT on gas and electricity from 13.5 % to 9 % until October 31, 2023.

The benefit in the form of the application of a reduced VAT rate is used not only in European countries. Thus, in **Barbados**, the preferential rate (7.5 %) instead of the standard rate (17.5 %) is being extended until September 2023 [216] for the supply of electricity for residential premises. The reduction of the VAT rate on household electricity used in residential buildings is applied only for the first 250 kilowatt-hours.

Reduced VAT rates are used not only to directly affect the level of energy prices. If the object of this kind of benefits is household energy equipment, the corresponding price reduction helps to ensure its availability and at the same time stimulates energy saving due to updating the relevant energy devices on a new technological basis. An example of this type of tax benefit is the application of a reduced VAT rate in **Croatia** [351] when carrying out operations for the supply of heating devices, which was temporarily introduced in 2022 and extended until March 31, 2024.

The application of the ultra-low rate of VAT, which is considered as an enhanced version of the previous preference, can be applied in those countries where the law provides for at least two levels of reduced rates.

The effect of the ultra-low VAT rate on the supply of natural gas in **Italy** [102] extended until September 2023. The VAT rate of 5 %, which was first introduced in 2022 in this country, applies to transactions with:

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- deliveries of natural gas used for domestic and industrial purposes, as well as for transport, taken into account in invoices issued for estimated or actual consumption;
- deliveries of thermal energy produced using natural gas under a service contract are included in the invoices issued for estimated or actual consumption;
- deliveries of centralized heat supply services, taken into account in invoices issued for estimated or actual consumption.

It should be noted that this benefit is renewed every 3 months at an unchanged level, starting from mid-2022.

The value-added tax preference in the form of applying a zero rate is extremely liberal.

Montenegro extends VAT “energy preferences” for 2023 [343] in the form of a zero rate. The new, expanded scope of application of the zero VAT rate includes services for providing access to networks through which natural gas, electricity and energy for heating or cooling are transmitted.

The zero rate of VAT is also applied in *Botswana* for operations on the supply of liquefied petroleum gas [215], which is aimed at stimulating the expansion of the scope of application of this type of fuel.

A relatively infrequent option for a tax benefit is the exemption from taxation of certain types of energy resources, which not only affects their availability for end consumers, but also allows changing the structure of energy consumption based on national priorities. Yes, in *Montenegro*, VAT is not levied on the import of such goods [343]:

- natural gas supplied by the natural gas system;
- natural gas refueled from a vessel for the transportation of natural gas into the natural gas supply system or into the natural gas supply system and supply chain;
- electricity through the electrical network and energy for heating or cooling through the corresponding network.

In *Kenya*, in 2023, the VAT exemption for operations with liquefied petroleum gas was extended, but at the same time the VAT rate for liquefied petroleum products was doubled [230], such as gasoline, kerosene, jet fuel, jet fuel, and others, from 8 % to 16 %.

In addition to applying a reduced VAT rate, *Lithuania* proposes to introduce a seasonal (from October 1 to April 30) scheme of compensation from the state budget for VAT amounts for suppliers of thermal energy and hot water [286]. Under these proposals, they will be compensated at the full 9 % VAT rate:

- for thermal energy supplied for the purpose of heating residential premises (including thermal energy transmitted through the hot water supply system);

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- for the purposes of supplying hot water to residential premises or supplying cold water for the preparation of hot water from it and thermal energy used to heat this water.

Currently, VAT on thermal energy and hot water supplied for the purpose of heating residential premises is neither fully nor partially reimbursed.

In addition to VAT, specific excise taxes that are taxed on energy resources (actual excise taxes, taxes on oil products, gas, electricity, etc.) have a serious potential to influence prices. The mechanism of action of benefits under these taxes is the same as under the considered benefits from VAT: any reduction in rates or exemption of certain energy resources from specific excise duties gives the manufacturer or importer the opportunity to reduce the selling price, provided the profitability of the corresponding product remains unchanged. However, as practice shows, such preferences differ significantly between countries in terms of the type of benefits applied, their degree of liberality, and the type of energy resources.

Reduced excise duty rates on fuel (gasoline, diesel fuel, and oil and natural gas) were introduced in 2022 in *Italy* in order to curb price increases in the following amounts: EUR 0.4784 per liter of gasoline; 0.3674 EUR per liter of diesel fuel; EUR 0.18261 per kilogram of liquefied petroleum gas and EUR 0 for natural gas used for transportation [99].

Estonia, which introduced reduced excise duty rates on electricity and fuel back in 2021, extended their effect until April 1, 2024 [38].

Reduced excise duty rates for gasoline and diesel fuel have been applied in *Belgium* since September 28, 2022. And since January 1, 2023, the effect of excise tax benefits on electric and thermal energy has also been extended [233], and taking into account the differentiation of consumers and consumption volumes, which has an important social significance. Yes, gas excise tax is set at zero rate for all consumers. Special excise tax rates are differentiated by consumer groups: from EUR 2.77 per MWh for protected consumers to EUR 8.23 per MWh for others, and the rate increases when gas prices rise above the threshold level (EUR 100) or decreases when the price decreases below 45 EUR. The base rate of the energy fee is set at EUR 0.9978 per MWh and is zero for protected consumers. Electricity taxation is also differentiated by consumer groups: for protected consumers, the special excise tax is equal to EUR 23.62 per MWh, and the energy tax is not met; for other consumers, the rate of special excise tax is in the range from 36.28 (maximum consumption) to 47.48 (minimum consumption) EUR per MWh, and the energy fee – 1.9261 EUR per MWh for all consumers of this group.

Some countries that apply reduced rates of excise, plan to abandon the type of their application. Yes, the planned gradual restoration of the standard rates of excise duty on fuel in *Ireland* [111], which was scheduled for February 2023, has been postponed until June 1, 2023. This means a temporary extension of the benefit.

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An example of the curtailment of preferences in the field of excise taxation can also be *the Czech Republic*, where the preferential rate of excise tax on diesel fuel (CZK 8.45 per liter), which was supposed to be applied from January 1, 2023 to December 31, 2023, as a measure to support transport companies in the current economic situation has been canceled from August 1, 2023, which means its increase to the level of the previous year (9.95 CZK per liter) [164].

Bulgaria from July 1, 2022 to June 30, 2025, there was a zero rate of excise tax on a wide range of excisable energy resources [380], in particular on:

- natural gas and liquefied petroleum gas used as motor fuel;
- produced thermal energy;
- energy products used for the combined production of thermal energy and electricity;
- electricity, provided that it (i) is produced from solar, wind, wave, tidal or geothermal energy (ii) is produced hydraulically or in hydroelectric power plants (iii) is produced from biomass or biomass products (iv) is produced from methane, emitted from abandoned coal mines, and (v) produced by fuel cells.

The application of the 0 % excise tax rate on petroleum products in Guyana has been extended until 2023 [207].

Norway for the first time applied a seasonal reduction in electricity tax rates [129] (the so-called “winter tariff”) during the first 3 months of 2023. The total electricity tax rate will be reduced from EUR 15.41 per kWh to EUR 9.16 per kWh from the beginning of the year until March 2023, and from April 1, 2023, the general tariff will start to apply again. This measure will reduce electricity prices by around 6 ere per kWh and is aimed at supporting both Norwegian households and businesses during peak electricity consumption periods.

In *Denmark*, starting from the IV quarter of 2022, for a period of 15 months, a reduced rate of tax on electricity will be applied [173]. Electricity tax has been reduced by EUR 4.0 per kWh since October 2022. And in 2023, the reduction will be increased to EUR 4.30 per kWh.

The *Portuguese* government has announced the gradual abolition of existing tax benefits on gasoline for certain products used in the production of electricity, electric and thermal energy (cogeneration), as well as city gas for organizations engaged in such production activities as the main type of activity [212]. In particular, certain products will no longer qualify for this tax exemption and will be taxed at normal rates for the purposes of petrol tax and additional CO2 tax.

The abolition of tax benefits will take place gradually, as follows:

- tax on certain products (eg fuel oil, gas and diesel) will be levied at 50 % of the current petrol tax rate and the applicable CO2 surcharge for 2023. This percentage will increase to 75 % in 2024 and 100 % in 2025;

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- for other products (petroleum gas and other gaseous hydrocarbons), the tax will be levied at 40 % of the applicable gasoline tax rate and the applicable additional CO₂ emission rate for 2023. Starting from 2024, this percentage will increase to 50 %.

In *Canada*, the provinces with the lowest tax rates on gasoline and diesel fuel are Newfoundland and Labrador [314]. will continue the tax reduction of 0.07 CAD per liter introduced from June 2022 until March 31, 2024. The current level of rates for gasoline in these provinces is 0.075, and for diesel fuel – 0.095 CAD, respectively. The introduction of such a preference makes it possible to restrain the inflationary growth of retail prices for motor fuel.

Preferences regarding import duties or other foreign economic taxes are interesting for countries that import energy resources in significant volumes.

An example of such a benefit can be the application in *San Marino* of reduced rates of the special tax on fuel imports (*imposta speciale sulle importazioni di benzina, gasolio e gas di petrolio liquifatti ad uso carburante*) in 2023 [104]. Moreover, this preference is implemented practically in a “manual” mode – through the monthly adoption of relevant legislative acts. Depending on the level of energy prices, special fuel import tax rates are reduced by 0.10 – 0.15 EUR per liter for gasoline and diesel fuel and by 0.0511 EUR per kilogram for liquefied petroleum gas (LPG).

Some countries apply non-typical taxes, the benefits of which can contribute to ensuring the availability of energy resources.

So, for example, Brazil temporarily reduces to 0 % the rate of social security contributions in the social integration program (PIS/PASEP) and in the financing of social security (COFINS) for:

- diesel fuel, biodiesel, liquefied petroleum gas – until December 31, 2023;
- alcohol, aviation kerosene, automotive natural gas and gasoline – until February 28, 2023.

In addition, the contribution for intervention in the economic sphere (*Contribuição de Intervenção no Domínio Econômico, CIDE*) levied on operations related to gasoline and its derivatives (except aviation gasoline) is reduced to 0 % until February 28, 2023 [29].

In the first half of 2023, there is a tendency in European countries to gradually curtail preferences for indirect taxation in the field of operations with energy resources, instead, new benefits for energy resources were practically not introduced. This is due to a decrease in the rate of growth of energy prices and a partial stabilization of the economies of European countries.

Analysis of the practice of using the anti-crisis instrument of indirect taxation in the second half of 2022 – the first half of 2023 shows that the application of reduced VAT rates and specific excise duties on energy carriers is quite widespread,

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and not only in European countries, but also in other countries. Among the features of this measure, typical for EU countries and promising for Ukraine, it should be noted a clear focus not only on specific types of resources, but also on the directions of their use and on specific groups of consumers (as a rule, the most vulnerable). At the same time, for its use, effective control over the targeted use of those resources or products for which preferential taxation regimes are established and control over the prices of the relevant resources should be ensured.

In order to compensate the losses of energy consumers as a result of the increase in prices in the world and European practice in 2022–2023, the toolkit of direct taxation of legal entities was used – to support companies with high energy consumption.

An example of such a toolkit can be the preferential tax policy of *Italy*, where the effect of the system of tax credits from the corporate income tax to compensate for the losses of industrial consumers has been extended until 2023 (Table 4.2) [100], which during the previous horn was extended (with changes) every quarter.

Table 4.2. Tax credits for industrial energy consumers in Italy

Beneficiaries	The size of the loan rate in 2022	The size of the tax credit in 2023, % of incurred expenses,	
		1 square meters	2 square meters
1	2	3	4
Group 1 – enterprises with high energy consumption	increased during 2022 from 10 to 40 %	45	20
Group 2 – Other enterprises	increased during 2022 from 10 to 30 %	35 % of the costs incurred for the consumed energy	10
Group 3 – enterprises with high consumption of natural gas	increased during 2022 from 15 to 40 %	45 % of costs incurred for natural gas	20
Group 4 – agricultural and fishing enterprises	remained at 20 %	20 % of the costs, excluding VAT, incurred when buying fuel	not provided
Group 5 – transport enterprises	remained at 28 %	not provided	

Compiled by the authors according to [100].

Thus, in this country by the 2nd quarter of 2023 there was a steady trend towards a gradual increase in tax credit rates for the first three groups of payers, while the benefit parameters for the fourth group remained unchanged. In the second quarter of 2023, a relative weakening of tax support for legal entities - energy consumers is expected, which can be considered as an expectation of stabilization of energy prices.

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The support of natural persons – consumers of energy resources in order to compensate for losses from the unexpected increase in energy prices and the general consequences of inflationary processes was carried out both by increasing various types of social benefits and using other budget policy tools, and at the expense of tax policy.

Simultaneously with the introduction of the reduced VAT rate in *Germany*, the so-called inflationary allowance was introduced [273]. This instrument provides for the exemption from taxation of compensation paid by employers in connection with inflationary processes (inflation premium), both in cash and in kind, in the amount of up to EUR 3,000. The period of validity of this benefit is until December 31, 2024.

To compensate for the inflationary losses of households from rising electricity costs, *Finland* has introduced a new tax credit for paying for electricity [10], which covers only electricity costs related to the permanent residence of an individual. Each person must apply for the credit separately, but electricity costs can only be credited once. For example, a married couple who live in the same house and jointly pay for electricity can apply for a loan separately, but only for their part of the main expenses. The fee charged for the transmission of electricity is not credited.

The size of the tax credit is 60 % of electricity costs incurred in the period from January 1 to April 30, 2023, at the expense of one's tax obligations. The credit applies to electricity costs exceeding 2,000 euros, up to a maximum of 6,000 euros. So, the maximum loan you can apply for is 2,400 euros per year. Credit for payment of electricity is provided in addition to credit for certain household services.

In *Spain*, in 2023, the threshold for individual income tax (a variant of the tax-free minimum income of citizens) was increased from EUR 14,000 to EUR 14,000 per year [183]. A similar measure is provided for in the state of *Missouri, USA*, where the individual income tax has been abolished for individuals with an income of less than 13,000 USD per year and married couples who earn less than 26,000 USD per year [313].

In *Ireland*, at the end of 2022, within the framework of the system of emergency payments for household electricity costs, a tax-exempt type of taxation will be paid to the electricity bills of citizens in the amount of compensation for price increases in the amount of EUR 600 [76]. Continuation of these measures is foreseen in the budget of Ireland for 2023.

A similar benefit was introduced by *Turkey* for the period until June 30, 2023 [388], but it does not refer to budgetary compensations, but compensation payments paid by employers to hired workers for clearly defined purposes (for electricity, natural gas, and heating). These payments, regardless of their size, are not subject to personal income tax and the employees' share of social security contributions until June 30, 2023.

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In addition to the above-mentioned instruments, increasing the limits of the ranges of progressive scales of individual income tax are most often used for anti-crisis regulation in individual income taxation (*Portugal* [212], *Austria* [212], etc.) as well as the reduction of individual income tax rates for taxpayers with low incomes (*Malaysia* [200] etc.).

In general, as the economic situation stabilizes, the European Union predicts a further phase-out of anti-crisis state energy support measures, if wholesale energy prices remain stable and lower energy costs are passed on to retail prices, as currently envisaged.

2. Stimulation of energy efficiency, energy saving and use of renewable energy sources.

The toolkit of this group simultaneously provides a solution to the most important task of the modern stage of human development – the construction of a “green” economy. It is this synergistic effect of the tools of the analyzed group of tools that determines their importance and perspective.

The implementation of the IRA Inflation Reduction Act in the United States, as well as the development and adoption in February 2023 of the European “Green Agreement” provided the prerequisites for the deployment of an extensive system of tax incentives in the energy sector.

“Green Deal” Industrial Plan for the Net Zero Era” [36] is based on four pillars: a predictable and simplified regulatory environment; faster access to sufficient financing; skills; and open trade for sustainable supply chains.

As part of the principle of faster access to sufficient funding, the European Commission plans to give member states additional flexibility in providing assistance, which should be limited to certain areas and on a temporary basis. Accordingly, the European State Aid rules should be changed, which will contribute to the widespread use of the relevant tax preferences.

A special state aid scheme has been approved by *Hungary* under the Temporary Crisis and Transition State Aid Framework adopted by the Commission on 9 March 2023 to support measures in sectors that are key to accelerating the transition to a green economy and reducing fuel dependency. Under this measure, assistance will be provided in the form of: (i) direct grants; and/or (ii) tax benefits. The event will be open to companies producing related equipment, namely batteries, solar panels, wind turbines, heat pumps, electrolyzers and carbon capture and storage equipment, as well as key components that are designed and mainly used as raw materials for the production of such equipment or related critical raw materials required for their production.

On July 28, 2023, the European Commission concluded that the Hungarian scheme is necessary, appropriate and proportionate to accelerate the transition to a “green” economy and promote the development of certain types of economic activity that are important for the implementation of the “Green Deal” industrial plan

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and approved the Hungarian program aid for accelerated investments in strategic sectors to facilitate the transition to a zero-emissions economy [353]. This confirms the perspective of tax preferences in the field of energy saving, energy efficiency and the use of renewable energy sources.

The same approach is followed by the OSCD, which believes that developing countries need economic growth to obtain sufficient tax revenues. However, such countries should avoid imposing “too high” tax burdens on prominent large formal sector firms and instead develop investment-friendly tax systems with a particular emphasis on investment in “green” industries [268].

As evidenced by the analysis of European and global preferential tax policy (Table 4.3), the greatest attention in 2022–2023 was paid to stimulating the production and use of electric cars and other vehicles with zero emissions.

Table 4.3 Toolkit of tax policy in the field of energy efficiency, energy saving and use of renewable energy sources

Taxes	Toolkit	Country
1	2	3
1. Stimulation of import, production and use of electric vehicles		
VAT, sales tax	Reduced rate	Indonesia
	Super low rate	Indonesia
	Zero rate	Norway
	Exemption from taxation of transactions with: conversion of cars to gas and electricity; sales of locally assembled electric cars; sales of new fully electric vehicles of any capacity (excluding hybrids); Purchases of vehicles with new energy consumption	Tanzania Malaysia Guyana China
	VAT deduction when buying electric cars	Lithuania
	Excise	Exemption from excise duty of locally assembled electric vehicles
	Application of negative excise duty	Mauritius
Toll	Exemption from import duties: on components for locally assembled electric vehicles; on imported fully assembled electric cars	Malaysia
Transport taxes	Exemption of electric vehicles from the tax on the purchase and registration of vehicles	Netherlands, Germany, China, Switzerland
	Reduction of transport tax rates for companies	Luxembourg

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Continue of table 4.3

1	2	3
Transport taxes	Revision of the methodology for determining transport tax rates taking into account CO2 emissions and carbon fuel consumption	Slovenia
	Increase in rates for cars using gasoline and diesel	Sweden, France, Ireland
	Transport tax tax credit for investments in zero-carbon trucks and charging infrastructure	Belgium
	Increasing the scope of benefits from the special consumption tax for electric vehicles	Turkey
Corporate income tax	Tax discount for new commercial electric vehicles, taxis and buses	Cyprus
	Tax credit for the purchase and installation of electric vehicle charging systems	France
	Tax credit of up to 35 % for national investments in strategic technologies	South Korea
	Accelerated depreciation electric vehicles and recharging equipment expenses for modernization of vehicles hybrid and electric commercial cars	Spain Guyana Peru
	Exemption from taxation of state subsidies to manufacturers of electric vehicles	South Korea
Regional income taxes	Investment tax credit for eligible manufacturers of electric vehicles	Illinois USA
Individual income tax	Exemption from taxation of the value of assistance in kind resulting from the private use of the company's electric vehicle	Slovenia
	Temporary tax credit for the purchase of new electric vehicles for installation of battery recharging systems	Spain
2. Stimulation of the development of alternative energy and the use of renewable resources.		
VAT	Reduced rate	Montenegro, Romania
	Zero rate	Germany, Ireland, United Kingdom
	Exemption from taxation of construction and installation works for the construction of power plants on alternative types of fuel	Moldova
Energy taxes	Exemption from taxation	Luxembourg, Norway
Corporate income taxes	Exemption from taxation of income from the sale of electricity and the type of sale of green energy certificates	Uzbekistan
	Tax credit for all renewable energy projects	South African Republic

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Continue of table 4.3

1	2	3
Corporate income taxes	Tax credit: for applied renewable energy sources; for clean energy for residential premises (formerly the renewable energy tax credit for residential premises); for the production of electricity from renewable sources.	USA
	R&D tax credit for renewable energy startups	Italy
	Investment volume tax credit for clean electricity	Canada
	Advance or accelerated depreciation	South African Republic
Individual income tax	Exemption from taxation of income from the sale of electricity	Germany, Turkey, Portugal, Uzbekistan
	Tax discounts	Germany, South African Republic
	Tax credit for the purchase and installation of solar photovoltaic systems for residential premises	Jamaica
	Tax credit for expenses incurred during the installation of photovoltaic systems (solar batteries)	Italy
Regional income taxes	Tax credit for sellers of biodiesel	Nebraska, USA
Land tax	Exemption from taxation	Uzbekistan
Property tax	Exemption from taxation	Uzbekistan
	Tax holidays for a period of 20 years	Michigan, USA
3. Energy efficiency and energy saving		
VAT	Reduced rate for energy-efficient heating systems with low emissions	Romania
Fuel tax	Tax credits for: – biodiesel fuel or renewable diesel mixture; – alternative fuel; – mixing diesel emulsion with water; – export of dyed fuel or gasoline mixtures; – stable aviation fuel.	USA
Corporate income tax	Tax deduction for energy efficient commercial buildings	USA
	Tax deduction for capital expenditures related to energy conservation and implementation of green technologies	Cyprus, Slovenia

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End of table 4.3

1	2	3
Corporate income tax	Tax credit: on investments in energy; for expanded investments in energy; for energy-efficient new houses; for the production of pure hydrogen; for the production of nuclear energy with zero emissions	USA
	Investment tax credit for ecological transition projects	Austria, Luxembourg
	Suspension of limitations on loss carryforwards	Germany
Regional income taxes	Tax credit in «green technologies»	Newfoundland and Labrador Canada
4. Energy saving and energy efficiency in everyday life		
Individual income tax	Tax discount for energy modernization	Greece
	Tax credit for energy efficient home improvement (formerly tax credit for energy efficiency of residential premises)	USA
	Tax credit for costs incurred to improve energy efficiency and reduce the seismic risk of real estate	Italy
Corporate income tax	Tax credit for energy production from renewable sources; property tax credit for refueling a car with alternative fuel	USA

In accordance with the objectives of the European Green Deal and REPowerEU (joint European action to ensure more affordable, secure and sustainable energy), the European Commission [91] proposed zero-emission targets for the road transport sector, in particular for new heavy-duty vehicles (HDVs):

- make all new city buses zero emission;
- reduce emissions from new trucks.

The use of the proposed tax measures will help reduce emissions by 45 % from 2030, 65 % from 2035, and 90 % from 2040.

Therefore, all measures aimed at reducing the demand for imported fossil fuels, improving energy saving and increasing efficiency in the EU transport sector simultaneously aim at energy efficiency and the formation of a green environment, that is, they will remain relevant in the future.

One of the areas of implementation of the green agreement in the EU countries is the stimulation of investments in vehicles with a zero emission level, in particular

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in electric vehicles, as well as in charging and refueling infrastructure. Similar trends exist in the USA and in other countries of the world.

The traditional approach to stimulate the import and production of electric vehicles in 2023–2024. indirect taxes remain, but the general trend is to abandon broad support and focus tax incentives on solving relatively narrow tasks.

Indonesia in order to accelerate the transition from using fossil fuels to electricity and to encourage people to buy battery electric vehicles, in support of the battery electric vehicle program, introduces value added tax (VAT) incentives [394] for the sale of four-wheeled electric vehicles and battery-powered buses for the tax periods from April 2023 to December 2023. The exemption provides for two levels of reduced rates depending on the specific weight of locally produced components:

VAT at the rate of 1 % applies to the supply of four-wheeled electric vehicles and battery-powered buses containing at least 40 % locally produced components;

VAT at the rate of 6 % – on the supply of electric buses with battery power, which include from 20 % to 40 % of locally produced components.

The Indonesian scheme is aimed at stimulating the consumption of electric vehicles with high national added value.

Norwegian the tax incentive scheme for the purchase of zero-emission cars, originally introduced in 2015, has since been extended and amended several times, and now provides a 0 % VAT rate for electric cars with a purchase price of up to NOK 500.000 (around EUR 43,000) and a VAT of 25 % on the amount of the excess – for those electric cars whose price exceeds the threshold level [418]. Thus, the introduced benefit does not cover the segment of luxury electric cars and is aimed at motivating Norwegians to buy personal cars with zero emissions instead of cars running on fossil fuels.

Lithuania from January 1, 2023 allows the deduction of VAT when purchasing electric cars [285]. Input or import VAT is deductible on an electric vehicle that is classified as an M1 vehicle and the value of which does not exceed €50,000 (including VAT). Currently, only VAT on special-purpose passenger cars (taking into account registration documents and vehicle classification) can be deducted. The purpose of the law is to stimulate the purchase of electric vehicles as environmentally friendly vehicles without state subsidies.

From fiscal year 2023 in **Kenya** [230] exempted from VAT operations on the import and supply of electric buses.

Replenishment of the fleet of electric cars in **Malawi** is stimulated by the exemption (starting from 2023) of the import duty of electric cars, and the creation of more acceptable conditions for their use – by the duty-free import of materials used for the construction of charging stations for electric cars, as well as the abolition of import duties on the import of systems charging [270].

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In 2023, *Malaysia* announced three tax breaks for electric cars [393]:

- complete exemption from import duties on components for locally assembled electric vehicles until December 31, 2027;
- full exemption from excise duty and sales tax on fully disassembled locally assembled electric vehicles until December 31, 2027;
- complete exemption from import duties and excise taxes on imported fully assembled electric vehicles until December 31, 2025.

The Government of *Tanzania* exempts from VAT in 2023 the supply of automotive accessories used in the conversion of fuel systems of motor vehicles to natural gas or electricity to persons engaged in the conversion of such motor vehicles [371].

Guyana's budget for 2023 provides [207]:

- abolition of VAT at the rate of 14 % on new all-electric vehicles of any capacity (excluding hybrids);
- acceleration of depreciation / capital investments in the amount of 50 % of the cost of vehicles, if companies or enterprises modernize their vehicles with more environmentally friendly electric vehicles;
- reduction of import duties from 45 % to 35 % on new cars (that is, less than 4 years old) with an engine capacity of less than 1,500 cubic meters.

An interesting experience of tax preferences – to stimulate the purchase of electric cars is used in *Mauritius* in the form of a negative excise tax in the amount of 10 %, but not more than 200,000 MUR (approximately 4400 USD). The term of this benefit is extended until June 30, 2024 [328].

China extended the one-time Vehicle Purchase Tax (VPT) exemption for new energy-efficient passenger cars [199]. Usually, the VPT rate is set at 10 % of the taxable price. Purchases of new energy vehicles between January 1, 2024 and December 31, 2025 will be exempt from value added tax up to CNY 30,000 per vehicle, and purchases between January 1, 2026 and December 31, 2027 will be exempt from value added tax up to CNY 15,000 per car.

Vehicles eligible for the preferences include fully electric cars, plug-in hybrid cars and fuel cell cars. To implement this benefit, the Ministry of Industry and Information and the STA will update the “Catalogue of types of vehicles exempted from payment of purchase tax”. The exemption will be available only for passenger cars listed in the catalog.

Reforms in the field of vehicle taxation and transport taxes carried out in the most developed countries in recent years mainly had an environmental focus, but at the same time provided energy savings by stimulating the spread of economical and ecological engines on traditional fuel, as well as promoting the use of vehicles using alternative types fuel.

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That is, in transport taxation, energy saving and energy efficiency are a side effect of building an economy with net zero emissions in order to expand the production of environmentally friendly technologies and prepare for the transition to “clean energy”.

These reforms were practically stopped due to the Covid-19 pandemic in 2020, but starting from 2021, they accelerated again. The general direction of these reforms, as noted in the OECD report, is the transfer of the tax burden to vehicles that pollute the environment the most, which is due to the increased level of consumption of traditional types of fuel. Examples of stimulating energy conservation, energy efficiency and the spread of vehicles that use alternative forms of energy are given in the Table. 4.4.

Table 4.4. Instruments of tax regulation of energy saving and energy efficiency in transport taxation, implemented or announced in the course of reforms in 2021–2022 (compiled on the basis of [364])

Country	A tool of tax regulation	The mechanism of influence on energy efficiency
1	2	3
Slovenia	Revision of the methodology for determining transport tax rates, taking into account not only current EU environmental standards and actual CO2 emissions, but also the level of consumption of traditional carbon fuels	The application of such differentiated rates allows for preferential taxation for cars with economical engines and engines with alternative types of fuel
Sweden	Increase in tax on vehicles using gasoline or diesel fuel during the first three years of operation	Stimulating the purchase of vehicles using alternative fuels
France	An increase in the registration tax for cars that pollute the environment the most and the introduction of special fines for exceeding the maximum weight of the vehicle (1800 kg)	Encouraging the registration of economical cars with gasoline engines and those that use alternative types of fuel. Deterring the registration of vehicles exceeding the weight limit, which is associated with increased fuel consumption
Ireland	Strengthening the differentiation of registration tax rates, which ensures increased tax rates for older and environmentally dangerous diesel cars	Accelerating the process of updating the car park with modern, more economical models of cars with reduced fuel consumption, stimulating the replacement of diesel cars, including cars using alternative fuels
Belgium	Tax credit for investments in zero-carbon trucks and charging infrastructure with a gradual reduction in the tax credit rate (application period - 2022-2026)	Part of the investment is repaid by reducing tax payments, which stimulates the purchase of trucks that use alternative fuels (primarily electricity) and the creation of gas station networks
Netherlands	Full exemption from payment of registration fee and vehicle tax for electric vehicles extended until 2024	Stimulating the purchase and operation of electric vehicles
Germany	Full exemption from paying the registration fee for electric cars extended until 2025	

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The analysis of the ratio of fiscal and liberal changes in the tax policy of different countries in the field of vehicle taxation did not reveal unambiguous trends for such taxes as excise tax, VAT or sales tax, tax on vehicle owners. For example, for 2020–2021, countries such as *Canada, Iceland and Seychelles* implemented or planned to increase the rates or expand the tax base of excise tax, VAT or sales tax, and concessions for these taxes were introduced in *Mauritania. Japan, South and Korea*. Fiscal and liberal changes took place in *Turkey* at the same time. It is quite logical that benefits were introduced for the most energy-efficient vehicles and canceled as the market became saturated with certain types of cars.

The situation is similar with respect to the tax on vehicle owners – fiscal changes from this tax were implemented in the *Netherlands* and *Sweden*, and liberal ones – in *Portugal* and *Slovenia*.

The only tax in the field of vehicles that was not used in tax incentives is the registration fee, the rates of which were increased and the tax base was expanded in such countries as *Ireland, Lithuania, Germany and Norway*, and none of the countries during 2000–2001. did not introduce any preferences for this tax.

In the OECD countries, after 2021, a reduction in rates and a narrowing of the tax base for vehicles using alternative types of fuel was observed according to transport taxes in *Belgium* and *the Netherlands*, and the opposite trend was observed only in Sweden [364].

In *Luxembourg*, tax preferences have been increased in the field of taxing company cars, primarily electric cars. Current legislation provides for a range of transport tax rates for companies of 0.8–1.8 % of the value of the car including VAT and additional equipment, depending on CO₂ emissions and fuel type. New preferential regime [298] for electric cars provides for the application of the following reduced rates.

- 1) For the company's electric cars registered between January 1, 2023 and December 31, 2024, as well as for electric cars with a contract signed before December 31, 2024 and registered until December 31, 2025:
 - 0.5 % for purely electric vehicles, the electricity consumption of which does not exceed 200 watt-hours / kilometer, and the maximum useful power of the power plant is less than or equal to 150 kW;
 - 0.6 % for company cars that do not meet the above requirements.
- 2) For company cars with a contract signed after December 31, 2024 and registered after 2025:
 - 1 % for purely electric cars with electricity consumption of no more than 200 watt-hours per kilometer and with the maximum useful power of the power plant less than or equal to 150 kW;
 - 1.2 % for company cars that do not meet the above requirements.

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The above benefits, firstly, create the interest of companies in the commercial use of electric cars without excessive overpowering; and secondly, in the accelerated renewal and increase of the transport fleet of electric vehicles.

Turkey from March 2023, increases the upper limits of the tax base ranges from the special consumption tax for electric vehicles at unchanged tax rates (Table 4.5).

Table 4.5. Special consumption tax rates for electric vehicles [92]

The power of a car with an electric drive	Rate (%)
Engine power no more than 160 kW:	
if the SCT base is less than 1.250.000 TL (previous limit 700,000 TL)	10
others	40
Engine power exceeding 160 kW:	
if the SCT base is less than 1.350.000 TL (previous limit 750,000 TL)	50
others	60

Such a change in the threshold values of the scale of construction rates indicates a significant liberalization of the taxation of electric vehicles with this specific excise tax, which will stimulate a decrease in prices and a corresponding increase in demand for environmentally friendly transport.

Switzerland plans to cancel the exemption from car tax for electronic vehicles of its own production from 2024 [276]. Car tax applies to the import of cars into **Switzerland**, as well as to the supply and own consumption of domestically produced cars. As the share of electric vehicle imports has increased dramatically over the past few years and prices have approached those of conventional vehicles, the current tax exemption for electric vehicle imports is no longer necessary as an incentive measure. Therefore, it is proposed to tax electric cars with a car tax (4 % of the value of the vehicle) only upon import.

An active role in stimulating the development of electric cars is played by the tools of corporate and individual income taxation.

The tax credit for the purchase and installation of electric vehicle charging systems has been applied in **France** since 2021 and is valid until December 31, 2025 [140]. The tax credit is granted under the following conditions: compliance of tax credit recipients with the criteria of tax relief recipients; compliance of the characteristics of the premises in which the charging stations are located with the established requirements; compliance with the requirements of costs for the equipment of charging stations; credit limit.

On June 29, 2023, **Spain** approved the following tax measures to encourage the purchase and operation of electric vehicles [184]:

Corporate Income Tax – Accelerated depreciation is introduced for new FCV, FCHV, BEV, REEV or PHEV EVs and EV chargers (for both private and public

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use) provided the vehicles/structures are put into service in 2023, 2024 and 2025. Investments can be amortized with an increasing factor of 2.

Individual income tax:

- a temporary (until December 31, 2024) 15 percent tax credit is introduced for the purchase of new electric vehicles that meet the established requirements. The offset will be applied in the tax period in which the vehicle is registered. Alternatively, such a credit will be applied if an advance payment of at least 25 % of the purchase price of the electric vehicle is made by December 31, 2024. In this case, the credit will be applied in the tax period in which such amount was paid, for provided that the balance is paid and the vehicle is purchased before the end of the second tax period immediately following the one in which such advance payment was made. In both cases, the credit is limited to a maximum amount of EUR 20.000 and applies only to the directly listed eligible vehicles. The basis for the deduction will be the purchase price of the vehicle, including the costs and taxes associated with the purchase, less any subsidy received under the assistance program;
- temporary tax credit for the installation of battery recharging systems – valid until December 31, 2024 in the amount of 15 % of the amount paid for the installation of battery recharging systems for electric vehicles owned by the taxpayer. The maximum annual base for this deduction will be EUR 4.000 from the amounts paid to the natural or legal person making the installation (excluding cash payments as legal tender).

In addition to federal tax benefits, tax preferences at the level of individual states are applied in the US. Thus, the Illinois Department of Commerce and Economic Opportunity has developed and operates an incentive program known as the Rethinking Electric Vehicle (REV) program [254].

The program introduced an investment tax credit for eligible electric vehicle (EV) manufacturers equal to 0.5 % of the investment made in qualified property. The credit can only be claimed in the year the property is placed in service, but can be carried forward for 5 years (if the EV credit exceeds the taxpayer's liability for the relevant tax year).

Qualifying property is defined as property that:

- is a material object, whether new or used, including buildings and structural components of buildings;
- subject to depreciation in accordance with the Federal Law;
- purchased by purchase, as defined in accordance with Federal law;
- registered by the taxpayer on the website of the corresponding project in Illinois;

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- not previously used in Illinois by another taxpayer who could qualify for the EV credit.

However, property that is either subject to federal accelerated depreciation or fully depreciated during the year placed in service for federal tax purposes does not qualify for the credit.

In *Cyprus* [15] increases the tax discount from the corporate income tax for new commercial electric cars, taxis and buses (from 20 to 25 % of the amount of their purchase costs), which is in line with the European trend of curtailing benefits for private electric cars and shifting emphasis to the use of electric vehicles for the transportation of goods and passengers. This relief will apply to capital expenditure incurred during the 2023, 2024 and 2025 tax years.

South Korea introduces an increased tax credit of up to 35 % for national investments in strategic technologies. Investments in national strategic technologies eligible for tax credits will be expanded to include: (i) five additional technologies and three additional facilities for the future transport sector, such as electric vehicle manufacturing capacity and charging technology and equipment. The tax credit applies to 5 new technologies related to electric vehicles and five additional installations for the hydrogen sector, such as technologies and equipment for the production of pure hydrogen based on the electrolysis of water [66]. Companies investing in these new technologies or facilities (i.e. making qualified investments in national strategic technologies) will be eligible to claim tax benefits in the form of a tax credit of up to 25 % (large or medium-sized companies) or 35 % (small and medium-sized enterprises).

An interesting toolkit of preferential tax policy in relation to electric cars is applied in *Thailand* [192]. State subsidies provided to domestic operators of the automotive industry that produce and assemble battery-powered electric cars, pickup trucks and motorcycles in 2022–2025 are exempt from corporate income tax. In addition, the import of spare parts for electric cars and electric boats on batteries is exempted from payment of customs duties until December 31, 2025, subject to compliance with certain conditions.

In *Peru*, a special depreciation regime has been established for electric vehicles [189]. Beginning in fiscal year 2023, the maximum annual depreciation rate will be 50 % for hybrid (piston engine and electric motor) or electric (electric motor) land transportation vehicles (excluding rail), provided they are purchased during fiscal years 2023 and 2024 and are in use to receive taxable income. Until 2023, the Income Tax Act established a 20 % depreciation rate for land vehicles (excluding railways).

In *Slovenia*, the value of assistance in kind resulting from the private use of the company's electric vehicle is considered to be zero [267]. This allowance does not increase the taxable base for personal income tax purposes. However, for employers, the costs associated with such a benefit are treated as deductible for corporate tax purposes.

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The analysis of the preferential tax policy in the field of transport taxes shows that those countries that have already reached a significant level of use of electric vehicles are already beginning to gradually curtail tax preferences in order to prevent the erosion of tax bases. So, for example, *Norway*, where in 2020 the specific weight of such vehicles, including hybrid cars, reaches 35 %, and in 2025 has set an ambitious goal of completely canceling the sale of cars on conventional fuel, is gradually reducing and canceling tax incentives for electric cars, as those that fulfilled their purpose. A similar situation with benefits for expensive electric cars is observed in *Ireland*.

Iceland reduced tax support for environmentally friendly cars [208]: firstly, the VAT exemption for plug-in hybrid cars expired in May 2022; and secondly, the amount of VAT relief for 100 % environmentally friendly cars at the end of 2022 has been reduced from ISK 1.560.000 to ISK 1.320.000 per vehicle. The total amount of VAT credits for electric vehicles is expected to gradually decrease over the next few years until 2026.

As for *Ukraine*, there is no tax on vehicle owners in our country, therefore, without its introduction, the relevant tools of tax regulation remain out of reach.

Excise, VAT, and customs tax benefits applied during the three months of 2022 when cars were imported into the customs territory of Ukraine were declarative and social in nature and were not aimed at achieving any results in the field of energy policy. As a result of numerous abuses, they were canceled. At the same time, the modification of these benefits for the purposes of energy saving and energy efficiency is considered possible, but requires a clear regulation of the targeted direction of the benefit and the organization of effective monitoring and control over its application.

Ukraine clearly lags behind in the field of tax incentives for the purchase and operation of vehicles using alternative fuels. Therefore, the introduction of preferences from the fee for the first registration of a vehicle on alternative types of fuel or the introduction of the fuel consumption indicator as one of the criteria for differentiating the rates of this fee is considered promising.

Tax incentives for the development of alternative energy and the use of renewable resources occupy a special place among the measures of the second group.

The expected impact of tax incentives for the development of alternative energy on greenhouse gas emissions is confirmed in a report by an agency at the Library of Congress (Congressional Research Service), which provides legislative research and analysis throughout the legislative process. entitled “Clean Electricity Tax Incentives – Projected Impacts on CO₂ Emissions and Generation Structure” (IN12082) [330]. Projected emissions from the energy sector will begin to increase in the late 2030s. Under the IRA, the production tax credit and investment tax credit for zero-emission electricity will be phased out when electricity sector greenhouse gas emissions fall

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to 25 % or less of 2022 levels, which is projected to occur in the mid-2030s years. As these tax credits expire, projections show that the downward trend in energy sector emissions reverses, with emissions increasing from the late 2030s to the 2050s.

In this subgroup, the vast majority of tax incentives are related to the spread of the use of solar energy, although such preferences have been used since the 90s of the last century. At the current stage, the relevance of the intensification of the use of solar energy is increasing, since this direction fully corresponds to the concept of the “green transition”.

One of the tasks of this direction is to ensure the availability of the necessary equipment for generation, which is ensured by means of indirect taxation tools, and above all, value added tax.

The first, most conservative step of tax regulation to solve the task is the application of a reduced VAT rate. This option is common among the new EU member states.

Thus, in *Montenegro* [343] in 2003, a reduced VAT rate of 7 % was introduced for the supply of solar panels, which is aimed at increasing the demand for this equipment.

From 16 January 2023, *Romania* introduced a reduced VAT rate of 5 % for the supply and installation of photovoltaic panels, solar thermal panels and high-efficiency low-emission heating systems, replacing the previous VAT rate of 19 % [321]. The reduced rate also applies to sets of relevant equipment, as well as to complex solutions for their installation. The amendments comply with the emission requirements set out in Annex V to EU Regulation No. 2015/1189 and Annex V to EU Regulation No. 2015/1185 intended for residential premises, public authority buildings and buildings belonging to organizations under the coordination/subordination of public authorities' bodies (with the exception of commercial companies).

The most radical variant of VAT benefits is the application of a zero rate, and in Europe, this preference is used precisely by industrialized countries

In *Germany*, from 2023, a zero VAT rate will be introduced for supply, import and purchase operations within the EU, as well as the installation of photovoltaic systems, including electricity storage systems [275]. That is, this benefit covers not only operations of supplying solar panels, but also operations of their installation.

Ireland from May 1, 2003, introduces a zero VAT rate on the supply and installation of solar panels for private housing [211] instead of the base rate equal to 23 %. This reduction in the VAT rate, which appears to be very important, is not temporary and permanent, although the scope of the preference is limited to households only.

The *UK* government is discussing the inclusion of batteries on solar panels (which are installed as an independent product) in the list of materials subject to

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the zero rate of VAT [366]. From April 2022, the installation of household storage batteries at the same time as solar panels will mean that the whole installation is zero-rated for VAT, and this benefit will run until 31 March 2027. The zero-rate has replaced the previous reduced rate of 5 % for such work in VAT added value (installation of energy-saving materials). However, batteries are not included in the list of zero-rated materials, so they are subject to VAT on a general basis if installed as an independent product; for example, later, after the installation of solar panels.

Moldova plans to apply, during 2024–2026, exemption from payment of VAT without the right of deduction for construction and installation works for power plants that meet the requirements, producing energy from renewable sources [94]. This benefit is not limited to solar energy alone and has a wider scope of application.

Benefits of the analyzed orientation can be provided in the construction of energy taxes, and above all - electricity tax.

As part of the third, additional package of energy assistance from March 7, 2023 (Solidarity Pak 3.0) [3] *Luxembourg* increases the threshold of tax-free solar capacity from 10 to 30 MWh to exempt electricity produced by households using photovoltaic panels from tax.

The *Norwegian* government has launched a consultation on exempting energy from renewable sources from the electricity tax [126]. The exemption will apply to production at installations with a total installed capacity of up to 500 kW per real estate object, i.e. the object of regulation is the energy consumption of households and small business entities. This tool is technologically neutral - it does not differentiate between different alternative energy sources such as solar, water or wind, and is complementary to the current exemption from solar energy. Excess capacity is taxed on a general basis.

Tax benefits in the field of solar energy use are widely represented in individual income taxation.

From 2023, in *Germany*, exemption from individual income tax and compensation of costs through the tax rebate mechanism in connection with the operation of small photovoltaic systems (up to 30 kW) that are manufactured or installed after December 31, 2021 are provided [275].

Income tax credits for the purchase and installation of residential solar PV systems in the 2023–2024 budget year are being introduced in Jamaica [206]. The tax credit will be granted to both employed and self-employed taxpayers and will be calculated at the rate of 30 % of the cost of the system, up to a maximum of 4 million JMD (24.5 thousand EUR). As arguments in favor of this step, the Government of *Jamaica* has indicated socio-economic benefits in the form of: environmental benefits from the reduction of carbon dioxide emissions, diversification of local energy supply and reduced demand for crude oil.

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A comprehensive system of incentives for producers of electricity from renewable sources has been introduced since April 1, 2023 in *Uzbekistan* [247].

Individuals and legal entities, when installing devices for generating electricity from alternative sources with a total capacity of up to 100 kW, are exempted from:

- property tax on installed objects;
- land tax for the plots occupied by these installations;
- corporate income tax or individual income tax on income from the sale of electricity received from these installations to the general electricity grid.

The benefits are valid for up to 10 years if an entrepreneur or private individual installs an energy storage system with a capacity of at least 25 % of the device's capacity; or 3 years in other cases.

From October 1, 2023 *Uzbekistan* introduces a system of “green energy” certificates confirming the production of electricity using renewable energy sources, and exempts the income received from these certificates from corporate income tax [248].

From July 1, 2023, this benefit applies to certificates for electricity produced at the hydroelectric power plants of the joint-stock company “Uzbekhydroenergo” (JSC “Uzbekhydroenergo”); and from October 1, 2023 – for certificates for electricity produced by solar, wind and hydropower plants.

One certificate for “green” energy corresponds to 1000 kWh of generated electricity. Certificates are in free circulation and can be transferred between persons in the manner established by law.

The income of green energy production enterprises, received from the sale of green energy certificates, is exempt from corporate income tax. The costs of purchasing the certificates are deductible for corporate income tax purposes.

New tax credits for rooftop solar and expansion of tax credits for renewable energy are planned for 2023–2024 in *South Africa* [218]. As part of the extended renewable energy tax credit, businesses will be able to claim a 125 % deduction in the first year for all renewable energy projects without generating capacity thresholds. (until 2023, for projects generating less than 1 megawatt, 100 % depreciation was applied in the first year, and for projects generating more than 1 megawatt, the depreciation scheme was applied: 50 % in the first year, 30 % in the second year, and 20 % in the third year). This Enhanced Business Tax Credit will only be available for investments first commissioned between 1 March 2023 and 28 February 2025.

Individuals will be able to claim a tax credit of 25 % on the value of any new and unused solar photovoltaic (PV) panels. To qualify, the solar panels must be purchased and installed on a private home, and the installation certificate of compliance must be issued between March 1, 2023 and February 29, 2024. The rebate is only available for solar panels, not inverters or batteries. The maximum amount of such discount cannot exceed ZAR 15.000 (approximately EUR 740) per individual.

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According to amendments made to Italian legislation in May 2023, qualified innovative start-up companies created after January 1, 2020 and operating in the environmental, renewable energy and health sectors can benefit from a tax credit [103] in the amount of 20 % of the costs incurred for research and development (R&D) aimed at creating innovative solutions for advanced technological tools and services that guarantee environmental sustainability and reduce energy consumption in the amount of up to EUR 200.000.

Turkey's 2023 budget increased the tax exemption limit for income from renewable energy production from 25 kW to 50 kW from January 1, 2023 [92]. Thus, individuals can sell up to 50 kW of electricity, which they produce with the help of installations on the roof and facades of their houses, without income tax.

A benefit similar in content was introduced by the *Portuguese* Budget for 2023. It provides for the deduction from the individual income tax of the annual income from the sale of excess energy that was produced for own consumption in an amount not exceeding EUR 1.000 per year [212]. At the same time, there are no restrictions on the power of solar batteries.

An important task of tax incentives in recent years is no longer the purchase or import of solar panels, but the creation of an appropriate infrastructure for the use, storage and transmission of solar energy.

Investment tax credit from corporate income tax at the rate of 15 % for clean electricity is provided for in the 2023 budget; in *Canada* [384] the application of this benefit for the period until 2028 is foreseen as part of the national decarbonization program during the implementation of investment projects in the production of stationary electricity storage systems, clean electricity transportation lines, production and implementation of small modular nuclear reactors and equipment for wind energy.

Nebraska, USA introduced the Nebraska Biodiesel Tax Credit Act, which establishes a new state income tax credit of \$0.14 per gallon on the sale of biodiesel as part of a consolidated revenue law [205] The biodiesel tax credit will be available to qualified retail dealers for taxable years beginning on or after January 1, 2024, but through January 1, 2029. The biodiesel retail sales tax credit will be available to Nebraska taxpayers who during the preceding calendar year engaged in the storage and dispensing of biodiesel fuel using a fuel pump located at the place of retail sale of motor fuel by the taxpayer. The Nebraska Department of Revenue can approve up to \$1 million in tax credits per calendar year. If the total amount of tax credits claimed by taxpayers in any calendar year exceeds USD 1 million, the department will distribute the tax credits in proportion to the amounts claimed.

To receive the retail biodiesel sales tax credit, a taxpayer will need to file an application with the Nebraska Department of Revenue between January 1 and April 15 of each calendar year, stating their name and address, the total number of eligible

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gallons of biodiesel sold by the taxpayer in retail during the previous calendar year, and any other data. documentation required by the department.

For purposes of the Nebraska Biodiesel Tax Credit Act, biodiesel must be derived from vegetable oils or animal fats, meet requirements for use in diesel engines, and must be “clean fuel” with less than 1 % diesel blend content. According to the Nebraska Soybean Council, there are currently more than 40 biodiesel retail locations in Nebraska.

A 20-year ad valorem property tax holiday has been introduced in the US state of *Michigan* for qualified solar energy facilities that are commissioned [312]. Such facilities include specialized structures and buildings used exclusively for the production of solar energy, including access roads, protective fences and means of communication (other than distribution or transmission lines). Owners or lessees of qualified solar installations exempt from property taxes must pay a solar facility tax of \$7.000 per megawatt of nameplate capacity, \$2.000 AC for facilities located on or in public specially designated areas), during each year after the facilities are put into operation. The tax is reduced by 50 % for objects that are under construction.

The traditional focus of tax incentives in the energy sector has been and remains energy saving and energy efficiency.

Cyprus plans to expand tax benefits in the field of energy efficiency for the tax periods of 2023, 2024 and 2025 [15]. The tax exemption is in the form of a corporate income tax credit for specific capital expenditures for companies that implement certain energy-saving measures. Businesses that start to improve the energy efficiency of their buildings will be entitled to an increased tax credit of 7 % instead of 3 % of the relevant capital investment. In addition, the tax discount for machines and equipment connected to systems of renewable energy sources and technical systems for improving energy efficiency is increased to 20 % (compared to the existing 10 %).

A tax benefit in the form of a tax discount for the transition to “green” technologies and digital technologies provided by *Slovenian* legislation [319] is a special benefit to encourage socially responsible behavior and sustainable, climate-neutral business models.

Legal entities and individual entrepreneurs are eligible for relief from January 1, 2022. They can reduce the tax base by 40 % of the actual expenses for qualified investments in relevant equipment or intangible assets.

The incentives include investments in cloud computing, artificial intelligence, big data, environmentally friendly technologies, cleaner, cheaper and healthier public and private transport, decarbonization of the energy sector, energy efficiency of buildings and the implementation of other climate neutrality standards. At the same time, the types of fuel with zero emissions include electricity and hydrogen. Taxpayers who invest in assets suitable for investment in the digital and ecological

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transition can claim the relief regardless of whether they are the owners of business premises.

The US Inflation Reduction Act (IRA) made significant changes to the procedure for providing tax incentives as incentives for renewable energy sources and energy efficiency (Table 4.6).

Table 4.6. The genesis of tax benefits in the US energy sector in connection with the adoption of the IRA [20; 114; 310]

Type of benefit	Changes made by the IRA Act	Period of validity
1	2	3
Energy-Efficient Home Improvement Credit (formerly the Non-Profit Energy Property Tax Credit or Residential Energy Efficiency Tax Credit)	credit rate increase starting in 2023 to 30 % with a \$1,200 annual limit and a \$600 per unit limit for most equipment	extended until 2032
Residential Clean Energy Tax Credit (formerly Residential Renewable Energy Tax Credit)	change in the annual loan rate for each technology	extended until 2034
Tax credit for investments in energy for business	<ul style="list-style-type: none"> – expanding the list of acceptable technologies and establishing new criteria and base amounts; – replacement of the credit with a new technologically neutral tax credit (tax credit for investments in ecologically clean electricity) after 2024 	extended until December 31, 2024
Tax deduction for energy efficient commercial buildings	<ul style="list-style-type: none"> – change in the amount of deduction; – change in requirements for energy efficiency deduction; establishing the amount of bonus deductions for projects that meet certain prevailing salary and internship requirements; permission for tax-exempt organizations (owners of buildings) to distribute deductions to the person primarily responsible for the design of the object instead of the owner of such an object 	no changes are foreseen
Tax credit for energy efficient new homes for home builders	<ul style="list-style-type: none"> – increase and change of the loan amount; – establishment of bonus loans for multi-apartment buildings 	extended until December 31, 2032
Tax credit for electricity production from renewable sources	replacement of the credit with a new technologically neutral tax credit (credit for the production of clean electricity) after 2024	extended until December 31, 2024

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End of table 4.6

1	2	3
Tax credit for the production of «qualified pure hydrogen»	a new tax preference aimed at stimulating the attraction of investments in relevant projects	the loan is granted within a 10-year period from the moment of commissioning of the relevant installation
Existing production credit for applied renewable energy sources	– the benefit is extended and modified; – solar energy facilities put into operation after 2021 are restored as eligible for credit.	no changes are foreseen

Built by the authors according to [20; 114; 310].

In February 2023 The Internal Revenue Service (IRS) of the USA has updated the credit program for advanced energy projects Advanced Energy Project [138], which amends and expands the investment tax credit originally included in the American Recovery and Reinvestment Act of 2009 (section 48C(e) of the Internal Revenue Code.

The enhanced energy tax credit for each taxable year is an amount equal to a specified percentage of the qualifying investment for that taxable year in any qualifying enhanced energy project of the taxpayer. The credit is granted in the tax year in which the Investment Property of the relevant project is put into operation. The basic lending rate is equal to 6 percent of the amount of the qualified investment. For projects that meet the “prevailing wage and internship requirements”, an enhanced credit rate of 30 percent of qualified investment applies.

The selection of promising energy projects is carried out in 2 stages, the first of which began on May 31, 2023. The taxpayer must submit its 48C(e) concept document to the Department of Energy by July 31, 2023. In addition, it must submit its application for the credit by the deadline. A project will be considered for distribution in the first round only if the US Department of Energy provides the IRS with a recommendation and rating of the project.

The taxpayer has two years from the date of acceptance of the application to provide evidence of compliance with the certification requirements. If this evidence is not received in time, the allocated credits will be cancelled.

An extensive system of fuel tax credits continues to operate in the US [311]. These include:

- credit for biodiesel fuel or renewable diesel mixture;
- credit for alternative fuel;
- credit for specified non-taxable use (or sale) of fuel during the tax year;
- credit for mixing diesel emulsion with water;
- credit for the export of dyed fuel or gasoline mixtures;

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– credit for sustainable aviation fuel.

Austria expands the scope of investment benefits in 2023, including climatically safe heating systems [271], which involves the installation of environmentally friendly heating systems together with the transition to environmentally friendly heating systems, such as heat pumps or district heating, as well as district cooling. According to the current rules, companies are entitled to claim an investment credit in the amount of 10 % (15 % in the case of certain environmentally friendly assets) of the costs of acquisition or production of a fixed asset subject to depreciation (no more than EUR 1.000.000 of acquisition or production costs per year excluding building components, including heating systems), provided that the normal useful life of the asset is at least 4 years.

On July 7, 2023, the Council of Ministers of the Duchy of *Luxembourg* announced a plan to expand the scope of the investment tax credit (the base rate increases from 8 to 12 %) [236], including ecological transition projects, as well as investments in energy (at a rate of 18 %). The tax credit for environmental and energy transition is granted if the implementation of relevant investments significantly increases the energy efficiency of the company's production process (provides savings of at least 20 % of the average amount of energy consumed during 5 years of operation) aimed at decarbonizing the company's production process or at the production or conservation of energy, obtained from renewable sources, to meet the company's energy needs. The introduction of these changes is expected from 2024.

A new instrument of tax regulation in *Germany* is the mechanism proposed in 2023 to suspend the effect of restrictions on the transfer of losses (i.e. by 60 % over 1 million euros) in the period from 2024 to 2027 from investment projects in new depreciated movable fixed assets and in existing movable fixed assets means and extension of the compensation period from 2 to 3 years, if these investments are included in the energy saving concept or energy management system of the company [274].

Newfoundland and Labrador (Canada)'s 2023 budget provides new green manufacturing investment tax incentives in the form of a 20 % “green technology” tax credit to help businesses with specific capital expenditures for “green” activities (such as equipment for energy saving and clean energy production, as well as efficient use of fossil fuels) [26].

A traditionally important direction of tax policy in the energy sector is the stimulation of energy saving in everyday life.

In February 2023, *Italy* introduced restrictions on certain tax benefits for expenses aimed at improving real estate by eliminating the possibility of transferring them to third parties [101]. The new restrictions apply to two benefits of an “energy” nature:

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- (extended) tax credit for costs incurred to improve energy efficiency and reduce the seismic risk of real estate;
- (extended) tax credit for costs incurred during the installation of photovoltaic systems (solar batteries).

That is, the scope of application of these benefits is limited exclusively to their acquirers.

Since 2023, in connection with the introduction of the Anti-Inflation Act (IRS) in the USA, the existing tax credit for energy-efficient home improvement has been reformatted [119]. The content of the preference is to encourage homeowners to make energy-efficient improvements to their homes. This applies to various energy-efficient retrofits such as solar panels, solar water heaters, wind turbines, geothermal heat pumps and fuel cell systems.

The rate of the tax credit is equal to 30 % of the total amount that taxpayers pay for qualified energy efficiency measures installed during the year, residential electricity costs and home energy audits.

The energy audit of the building should identify the most significant and cost-effective improvements to the energy efficiency of the living space, including an assessment of energy savings and costs for each improvement. According to the new order, the home energy auditor must provide the taxpayer with a written audit report. Beginning in 2024, taxpayers will need to certify that a qualified auditor has performed a home audit. To meet this requirement, an auditor must be certified by one of the certification programs listed on the Department of Energy's Home Energy Credit Certification Program page to conduct a home energy audit (the auditor certification requirement did not apply until January 1, 2024).

Greece continues the tax discount from the individual income tax for “energy modernization” [56] in the amount of 40% of the costs incurred by individuals to modernize the energy consumption of their buildings until December 31, 2024. The maximum amount of such a tax discount for five calendar years (from January 1, 2020 to December 31, 2024) is EUR 16.000 , and the discount is granted in equal parts within 4 years after the realization of modernization costs. According to Greek law, private individuals must bear the costs of energy, functional and aesthetic modernization of their buildings.

Thus, the tools of the second group are much more extensive and diverse, the main emphasis is not on indirect taxes (as was done with the measures of the first group - instruments of anti-crisis tax regulation), but on income, property and environmental taxes. Considering the relevance and importance of the green transition as for Europe, as well as for the world community, in the future, we should expect an increase in the importance of the toolkit of tax incentives for energy saving, energy efficiency and the development of alternative energy.

3. Temporary solidarity contributions.

One of the non-traditional tax instruments used in the EU, primarily in the context of combating the energy crisis, is the introduction of solidarity contributions. In this case, the positive effect is not achieved through a direct influence on the price of energy resources, or creating motivation for consumers to reduce their consumption. This tool is aimed at redistributing part of the profits, not related to the companies' own efforts, in favor of the state in order to create additional sources of financing budget subsidies to the most vulnerable groups of energy consumers and tax expenses (tax benefits). To some extent, this mechanism implements the principle of fairness of taxation and increases the tax burden on companies that receive extremely high profits due to changes (or even distortions) of the market situation that are independent of them.

The intensive development of solidarity contributions and their implementation in the European fiscal space in 2022–2023 are closely related to the crisis phenomena that have arisen in the field of energy prices and the related increase in the level of inflation. This is one of the consequences of the military aggression of the Russian Federation against Ukraine.

The problem of high prices for energy resources is also relevant for Ukraine, but at the stage of post-war recovery, the problems of financing investments in energy saving and energy efficiency come to the fore, one of the sources of which can be the receipt of solidarity contributions. Based on this, it seems necessary to analyze the regulatory regulation and practice of applying solidarity contributions in the EU in the context of the possibility of their use in Ukraine.

Solidarity taxes are not something fundamentally new in the world tax theory. From a theoretical point of view, solidarity taxes were studied in the works of such scientists as: S. Kapur [153], J. Lundberg [228], E. Saez [325], M. Shigeki [332], etc. The works of A. Faiola and D. Laje are devoted to the theoretical justification of the use of solidarity taxes in the anti-crisis tax policy of various countries to counteract the negative consequences of the COVID-19 pandemic [172], C. Giles [107], E. Saez, G. Zucman and C. Landais [325] etc. However, the architecture and use of solidarity taxes in the energy sector have serious specifics and require in-depth research and critical generalization.

Despite the relatively ancient history, until the 20s of the 21st century, solidarity taxes were used to solve local problems of a national nature, and their application was mostly limited to the spheres of individual income or property taxation (wealth and luxury taxes). The relevance of solidarity taxes has increased significantly in connection with the entry of the world economy into a number of crises of non-economic origin: in 2020 – the crisis caused by the COVID-19 pandemic, and from 2022 – a crisis caused by Russia's large-scale military aggression against Ukraine,

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one of the manifestations of which was the energy crisis, which was particularly strong in the EU countries. Moreover, in modern conditions, solidarity taxes are no longer limited to taxes on wealth and luxury, they, which are fundamentally new, have spread to the sphere of corporate income tax and even indirect taxation, and their use has gone beyond national jurisdictions and acquired a coordinated systemic interstate character.

In terms of their economic essence, solidarity taxes are quite ambiguous, which led to different terminological approaches even to their name. Yes, the UN Tax Committee [35] uses the term “solidarity tax”, at the same time as in Europe [81] this type of payment is usually called a “solidarity contribution”. Along with the fact that, as a synonym for solidarity contribution, European countries (for example, the Netherlands, Germany, the Czech Republic, etc.) use the term “windfall profit tax (WPT)” in their national legislation. There are other variants of the name of such taxes.

The specific characteristics of this group of taxes include the following:

- target orientation. Usually, such taxes are paid for the purpose of financing projects that are theoretically aimed at the solidarity (uniting and strengthening) of society [345; 346];

- redistributive nature. The mechanism of their action involves an uneven tax burden on different groups of taxpayers: a higher level of taxation for more capable groups of taxpayers and further use of revenues in the interests of other, less well-off, groups of taxpayers or public interests in general;

- in the vast majority of cases, solidarity taxes can be classified as direct and, in a certain sense, can be considered as specific (for certain groups of taxpayers) supplements to individual or corporate income taxes that ensure the progressivity of taxation;

- solidarity taxes have a national character, are introduced as an additional payment at the national level and are carried out throughout the country, although a specific goal can be set at the regional level (for example, the introduction of the solidarity tax in Germany in 1991 was aimed at financing the revival and reintegration of the eastern lands [344]);

- a limited period of action, which is related to the duration of the implementation of the corresponding project. Since the tax is introduced to finance certain targeted expenses, the achievement of the set goals determines the expiration of the term of its application. At the same time, the tax term can be set by a specific calendar date, or tied to the end of a certain period.

In European taxation, solidarity taxes were applied in such countries as: *France* (1981), *Germany* (since 1991), *the Czech Republic* (2013), *Latvia* (2016), *Poland* (2019). And from 2022, the scope of their application was extended to almost all EU countries.

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The purpose of the solidarity tax in *Israel*, as in *Germany*, was to finance the equalization of the level of development of certain areas of the country, but the tax was limited to only a 3 % surcharge to the individual income tax on extremely high incomes [141]. In *Japan*, the purpose of the introduction of the solidarity tax in 2013 (also in the form of a supplement to the individual income tax) was to rebuild the country after the devastating tsunami and the accident at the Fukushima nuclear power plant [332].

The most massive implementation of the solidarity tax in Europe is related to countering the consequences of Russian aggression against Ukraine in the energy sector, and for the first time in the practice of regulating direct taxation, the recommendations on the unification of the solidarity contribution were regulated by the EU Council Resolution – the EU Council Regulation of October 6, 2022 No. 2022/1854 “On emergency intervention to solve the problem of high energy prices” (hereinafter - Regulation 2022/1854) [240].

The purpose of solidarity contributions is the redistribution of profits received by energy companies as a result of external factors independent of the business entity’s activities, such as market conditions, the presence of speculative operations of other actors, artificial restrictions, etc.

Regulation 2022/1854 [240] provided for the expediency of applying two different models of solidarity contributions: for energy-producing and power-generating companies.

The first model received the official name “temporary solidarity contribution” in the EU, it applies to the sectors of oil, gas and coal production, as well as oil refining. Its main elements (Fig. 4.1) are broadly defined by Chapter 3 of the Regulation [240], although there remains the possibility of their regulation by national legislative acts on taxation.

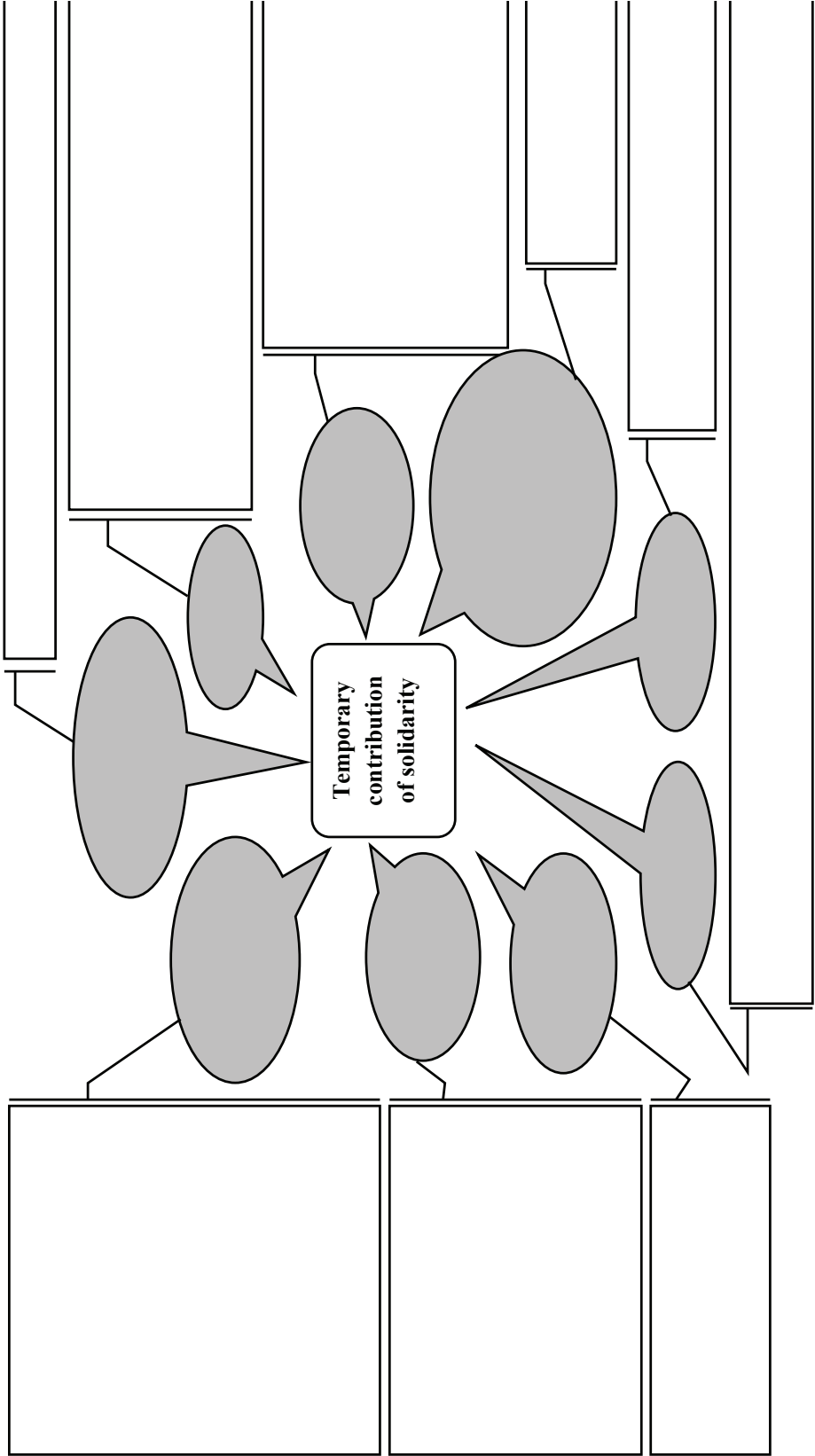


Fig. 4.1. Elements of the temporary solidarity contribution applicable in the EU fossil fuel sector
Compiled by the authors on the basis of Regulation 2022/1854 [240].

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This model is unified and regulated by the EU Council. Its appearance and construction are directly related to the European energy crisis caused by Russian aggression and the subsequent general increase in inflation. That is, the main task of this WPT model is to extract part of the unpredictable profits of corporations in the fossil fuel sector (except electricity producers) and oil refining and redistribute it to finance anti-crisis measures in the field of energy consumption.

The temporary nature of the solidarity contribution is directly recorded in Art. 18 of the Regulation [240] – its effect extends to two years: 2022 and 2023, and unlike the general practice, this regulatory act of the European Union, adopted in October 2022, has retroactive effect and can be applied (if this is provided for by the relevant national legislative act) starting from January 1, 2022.

According to its characteristics, the temporary contribution of solidarity can be classified as a type of direct taxes, the degree of regulation of which in the European Union is much more liberal, compared to indirect taxes. That is why its mandatory introduction by the EU member states is of fundamental importance.

The regulation (clause 14.1 of article 14) establishes that the excess profit received by companies and permanent representative offices operating in the specified sectors is subject to a mandatory temporary solidarity contribution, if the member states have not taken equivalent national measures. In other words, the alternative to the contribution is the implementation of equivalent measures at the level of the national economy.

The interpretation of the “equivalence” of measures at the national level is given in clause 14.2 and contains three mandatory conditions:

national measures must be aimed at achieving the same goals as the temporary solidarity contribution;

they must be subject to the same rules (including regarding the directions of use of the received income);

they have generated comparable or higher revenues compared to the estimated revenues from the solidarity contribution.

In practice, this means the possibility and admissibility of implementing a more fiscal approach at the national level and a ban on any liberalization in the area of taxation of excess profits in the fossil fuel sector.

Since the temporary contribution of solidarity is a targeted tax, a general vision has been formulated within the EU regarding the possible directions of using these revenues. Such areas include:

(a) financial support measures for end-users of energy and in particular vulnerable households for targeted mitigation of the consequences of high energy prices;

(b) financial support measures contributing to the reduction of energy consumption, such as demand reduction auctions or tender schemes, reduction of

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energy end-users' costs for purchasing energy for certain consumption volumes, incentives for end-energy end-users to invest in renewable energy sources, investments in structural energy efficiency or other decarbonization technologies;

(c) financial support measures to support companies in energy-intensive industries, provided that they are conditioned by investments in renewable energy sources, energy efficiency or other decarbonization technologies;

(d) financial support measures for the development of energy autonomy, in particular investments in accordance with the REPowerEU objectives set out in the REPowerEU plan and in the REPowerEU joint European actions, such as projects with a cross-border dimension;

(e) part of the revenue from the temporary solidarity contribution may be directed by the Member States to the general financing of measures to reduce the harmful effects of the energy crisis, including support for the protection of employment and retraining and upskilling of the workforce, or for the stimulation of investments in energy efficiency and renewable energy sources, in including in cross-border projects, as well as in the financing mechanism for renewable energy sources of the Union, provided for in Article 33 of Regulation (EU) 2018/1999 of the European Parliament [300].

The first of the above directions is current in nature and provides support for consumers of energy resources and partial compensation for losses incurred by them from price increases as a result of the energy crisis. Instead, the other four directions provide for the possibility of financing investments according to the goals agreed at the European level. This point indicates the possibility and expediency (from the point of view of EU norms and rules) of using funds received in the form of taxes on windfall profits as a source of investment, and this is already important for Ukraine in the context of the search for additional sources of investment at the stage of Ukraine's post-war recovery.

Subjects of taxation (see Fig. 4.1) with a temporary solidarity contribution are companies registered in the European Union, as well as their permanent representative offices, operating in the sectors of crude oil, natural gas, coal and oil refining, including those that are part of a consolidated group only for purposes of taxation. Clarification of the quantitative criteria of contributors is contained in Art. 2.16 of the Regulation [240] according to which only those who generate at least 75 percent of their turnover from economic activity in the field of coal and natural gas extraction, oil extraction and processing, or production of coke products in accordance with Regulation (EU) no. 1893/2006 [299]. By this Regulation, coal mining is assigned to the following sections of KDES: 05 (groups 05.1 – hard coal mining and 05.2 – lignite mining); 06 (groups 06.1 – coal mining and 05.2 – lignite

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mining); 19 (groups 19.1 production of coke products and 19.2 – production of oil refining products).

The EU-regulated quantitative criterion of the payer of contributions is duplicated in national legislative acts. This was done, in particular, in *the Netherlands* [235], *Sweden* [126], *Romania* [320], *Poland* [323], and many other EU countries. With regard to the specialization of companies, the national peculiarities of determining the payers of the solidarity contribution are determined by the presence in the country of extracting the relevant types of energy resources and oil refining and coking capacities.

When determining the circle of WPT payers, countries are given the right to take into account the specific conditions of affiliation of business entities. So, for example, in *Romania*, the payers of this contribution include subsidiaries of legal entities – payers, as well as companies affiliated with any taxpayers, regardless of the type of activity performed, which receive more than 50 % of their turnover from them [322]. On the other hand, mining and processing companies that did not carry out taxable production activities in the period from 2018 to 2021 are not recognized as payers of the temporary solidarity contribution in this country.

The peculiarities of the national approach to the legislative regulation and administration of WPT may be due to the nuances of determining the tax base of this contribution. For example, most countries use the same indicators for its calculation that are used to determine the tax base for corporate income tax, and the method of their calculation is not unified. So, for example, in *Romania*, the profit for calculating the amount of WPT is not reduced by the amount of losses carried forward [320].

The recommended tax threshold level for all countries is 20 %, i.e. the tax is not applied if the annual increase in profit compared to the base value of profit does not exceed 20 %. If it is necessary to increase the income of WPT, the national legislation can establish a reduced amount of the tax threshold (yes, in Italy it is set at the level of 10 % [98]);

To determine the tax base, usually, as provided for in the Regulation [240] the sum of the excess of the actual annual profit over the average of the previous 4 years is used (multiplied by 120 %, which makes it possible to smooth out sharp fluctuations in profit, but in some countries other approaches are used. So, for example, in Poland, the tax base is set at the excess of the actual profit over 120 % of the actual profit for the previous year [323]. This contribution will be accumulated in a special Fund for the payment of the difference in prices. The contribution is intended to provide additional funds to finance the reduction of electricity prices for end consumers.

Denmark proposes to introduce a solidarity contribution for the fossil fuel sector in accordance with Regulation [240], but only for 2023 [175] taking into account the principle of legal certainty. In addition, according to the Danish Government,

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hydrocarbon production companies should be able to offset the temporary solidarity contribution against the hydrocarbon tax that they have to pay against the taxable income from hydrocarbons in the 2023 income year. If these companies have losses carried forward to future periods, they will need to be excluded when calculating taxable income for 2023 to apply the joint and several contribution.

The minimum solidarity contribution rate is recommended in the EU at the level of 33 % of the amount of excess profits. A significant number of EU countries adhere to exactly this size. At the same time, some countries used their right to set increased rates of the temporary solidarity contribution. Thus, in *Slovakia* at the time of its introduction, the contribution rate was equal to 55 % [113], but from May 1, 2023, it was increased to 70 % [414]. The new rate level will be applied in the current tax period, starting from January 1, 2023.

In Italy the contribution rate is equal to 50 % [98], and as a positive point it should be noted the establishment of the marginally permissible maximum size of WPT, which cannot exceed 25 % of the net value of equity capital at the end of 2021. The last limitation is a kind of “safeguard” against dangerous damage to the payer of this contribution. The WPT rate in Romania is set at 60 % [320]. In May 2023 *Romania* has changed the taxation procedure for oil mining and oil refining companies [322]. For these payers, instead of the ad valorem rate, a specific solidarity contribution rate of 350 RON per ton of refined oil has been established.

The length of the tax period is usually equal to the fiscal year. Since this concept is not unified, different countries apply the approaches provided by the current national legislation. The payment procedure, which differs quite seriously in different countries, is also not defined by the Regulation: from advance payments (as provided for in *Hungary* [122]) to the monthly postpaid within 25 calendar days of the following month – in *Slovakia* [137] and even the half-year following the tax year (the option used in *Italy* [98] and *Romania* [322]). In *Bulgaria*, the temporary solidarity contribution is integrated into the corporate income tax legislation, has a two-year tax period (2022 and 2023) and is payable in the first half of the year following the end of the tax period, i.e. no later than June 30, 2024 [379].

The different level of the basic corporate income tax rate can also be a problem. This leads to additional national differences in WPT receipts.

Inequality of approach, in addition, may be a consequence of different mechanisms of interaction of the solidarity contribution with other national taxes. Article 16.2 of the Regulation provides that the solidarity contribution is applied in addition to ordinary taxes and contributions, which are paid in accordance with the national legislation of the member state. But the problem of the possibility of assigning WPT to expenses remains unresolved, as a result of which the tax base and

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the amount of corporate income tax revenues may decrease, which will thus reduce the effective rate of the solidarity contribution.

In *Denmark*, hydrocarbon production companies can set off a temporary joint and several contribution against the hydrocarbon tax applicable to their taxable income in 2023 [174; 175]. When calculating taxable income for 2023, any carry forward losses incurred by these companies must be excluded for the application of the joint and several contributions.

However, some of the EU countries have proposed their own temporary solidarity contribution structures for energy sector companies.

In *Hungary* the original version of the solidarity contribution for oil refining companies, which was implemented even before the adoption of the Regulation [240] and is based not on the amount of excess profits received from the sale of energy resources, but on the price level. The tax base is defined as the difference between the world price of crude oil and the contract price for the purchase of Russian oil [122]. At the time of introduction in June 2022, the tax rate was equal to 25 %, from August 1, 2022, it was increased to 40 %. In 2023, the conditions for paying the contribution changed and there was a differentiation of rates by types of energy resources [122].

From April 1, 2023, *Hungary* introduced some tax reliefs on the excess profits of oil producers [160]. Namely, the increase in oil production above the level of 2021 is not subject to the tax on royalties for the extraction of minerals, which leads to a decrease in the appropriate tax on additional income. This tax break is designed to stimulate an increase in oil production. In addition, the taxable base of the additional income tax, introduced in 2022 and determined on the basis of the Brent-Urals spread (the difference between the purchase price of crude oil in Russia and the world price of oil), is reduced by 7.5 USD per barrel, which also leads to a significant reduction in the amounts of the solidarity contribution payable.

From January 1, 2024, the government plans to reduce the special tax rate for oil product producers from 2.8 % (2023 level) to 1 % per year. The tax base remains the net turnover based on the annual report for the 2022 tax year.

From September 1, 2023, the calculation of mining royalties will depend on the value of raw materials according to the technical production plan, which will allow to reduce the tax payable.

For natural gas, if the stated value is between HUF 28,000 per MWh and HUF 55,000 per MWh, the tax is 48 %, 42 % for sale at free price and 36 % for trial production. If the unit price exceeds HUF 55,000 per MWh, the rate increases to 62 %, and in the case of free price sales and trial production – to 56 %.

In the case of certain types of crude oil, if the value is between HUF 230,000 per ton and HUF 260,000 per ton, the tax amount is 24 %, if it exceeds HUF 260,000 per ton, the mining tax amount is 44 %.

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In *Spain*, WPT payers include the main operators in the electricity, natural gas, fuel and liquefied petroleum gas sectors whose net turnover is equal to or greater than EUR 1 billion in 2019 and their net turnover in any of 2017, 2018 or 2019, obtained as a result of energy activities, which would determine their qualification as the main operator, exceeds 50 % of the total net turnover of the company for the year [185]. The tax base is defined as net turnover excluding, among other things, domestic regulated business, foreign operations and hydrocarbon tax reflected in the income statement for the year preceding the year to which the tax relates. That is, the net turnover of 2022 will be considered for the fee payable in 2023, and the net turnover of 2023 for the fee payable in 2024. The WPT rate in *Spain* is 1.2 % of the tax base.

The UK Treasury has confirmed that the energy windfall tax, which leads to a marginal tax rate of 75% on North Sea oil and gas production, will remain in place until March 2028 if oil and gas prices remain above historical levels norms [226]. However, the levy can be waived if prices consistently return to normal levels over a long period, meaning the tax rate will be 40 %.

Windfall tax in *Belgium* [234] is made in the form of a temporary joint contribution and is applied to the following two types of enterprises:

- registered oil companies operating in the oil refining sector, which have processing facilities in Belgium;
- registered oil companies, which, in accordance with the Royal Decree of February 5, 2019, were designated as the main participants for 2022 with regard to diesel fuel, gas oil and gasoline.

The amount of the contribution to be paid by the first group of companies is set at EUR 6.90 per ton of crude oil imported between January 1, 2022 and December 31, 2023.

The amount of the contribution to be paid by the second group of companies is set at EUR 7.80 per cubic meter of product released for consumption between January 1, 2022 and December 31, 2023.

Some countries have applied non-standard approaches to the temporary solidarity contribution, significantly expanding the range of tax subjects with other tax bases and WPT construction.

Thus, in some countries, pharmaceutical companies (*Hungary*), banking and financial institutions (*Spain*), financial intermediaries (*Italy*), etc. are defined as tax subjects.

One example of the application of such approaches is *Bulgaria*, which proposes to introduce a one-time 33% tax on excess profits [68] for the second half of 2023 for all persons subject to corporate income tax (except payers of the temporary solidarity contribution for the fossil fuel sector). The taxable base should be determined, as a

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rule, as the difference between the tax profit for the period from July 1 to December 31, 2023 minus 50 % of the average value of the tax profit for the period 2018–2021, increased by 20 %. It is proposed that the contributions be paid in monthly advance payments between 1 July and 31 December 2023, with the final payment being made by 1 July 2024. The new contribution will also apply to those subject to alternative corporate income tax, i.e. to individual entrepreneurs and persons equated to them for taxation purposes.

In order to stimulate economic activity and strategic investments, the Italian government is introducing a new tax on the windfall income of financial intermediaries [284] (except asset management companies and brokerage companies). An extraordinary tax of 40 % will apply to (i) net interest margin earned in 2022 that is at least 5 % higher than the margin earned in the previous year and (ii) the amount of net interest margin earned in 2023 that is at least 5 % 10 % higher than the margin obtained in the previous year. The extraordinary tax will be paid in 2024 and will not be deductible for income tax or regional production tax (*imposta regionale sulle attività produttive*, IRAP) purposes.

Ireland has not yet adopted the legislative act on the temporary contribution of solidarity. Adoption of such a law is foreseen in September, and the tax base will cover 2023 and 2022, and the expected name of the payment is a temporary solidarity allowance for excess profits in the energy sector. [112]. However, the parameters declared in the draft law (threshold for determining excess profits – 20 %, period for calculating average profit – 2018–2021) correspond to the structure: provided for by the Regulation [240]. The fundamental difference between the draft law and the recommended parameters is that the tax rate has been increased by more than 2 times – 75 %.

Thus, the presence of numerous differences in national approaches to determining the elements of the solidarity contribution for companies in the fossil fuel sector requires further research using the practice of its implementation, on the basis of which conclusions can be drawn regarding the prospects for the application and development of WPT. However, in the statement of the Eurogroup on financial guidelines for 2024 dated March 13, 2023 [82] confirmed the need to continue protecting the most vulnerable households and viable firms while maintaining incentives to limit energy consumption and improve energy efficiency. In this context, the preservation of the solidarity contribution for the nearest period of time also remains relevant.

The solidarity contribution mechanism in the field of electricity (Articles 7–9 of the Regulation [240]) is fundamentally different from a similar payment made in the EU from companies in the fossil fuel sector: instead of the estimated amount of excess profit, the tax base is the income from electricity supplies at prices exceeding

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the threshold level. This construction of the tax is more in line with the characteristics of indirect taxation. The purpose of the implementation of this solidarity contribution is to temporarily limit the extraordinary market revenues of producers with lower marginal costs by withdrawing excess profits obtained as a result of the existence of a difference between market prices and the marginal price when selling electricity within the EU.

EU generating companies that produce electricity exclusively from sources included in the exhaustive list (Article 7.1 of the Regulation) are defined as tax subjects.

The following are not subject to taxation in accordance with the Regulation: generating companies that produce electricity with technologies that use natural gas substitutes such as biomethane as input fuel, so as not to jeopardize the conversion of existing gas-fired power plants in line with the REPowerEU objectives set out in particular in the Commission report of 18 May 2022 On the REPowerEU plan (“REPowerEU plan”);

companies implementing demonstration projects;

producers whose incomes per MW of generated electricity are already limited as a result of the implementation of national policy measures;

companies located in remote regions that cannot be interconnected with the EU electricity market.

The implementation of this type of solidarity contribution is not mandatory for Cyprus and Malta, but in the event that Cyprus introduces this mandatory payment, it will not be able to cope with electricity produced from crude oil products.

The key characteristics of the temporary solidarity contribution for companies generating electric energy are presented in Fig. 4.2.

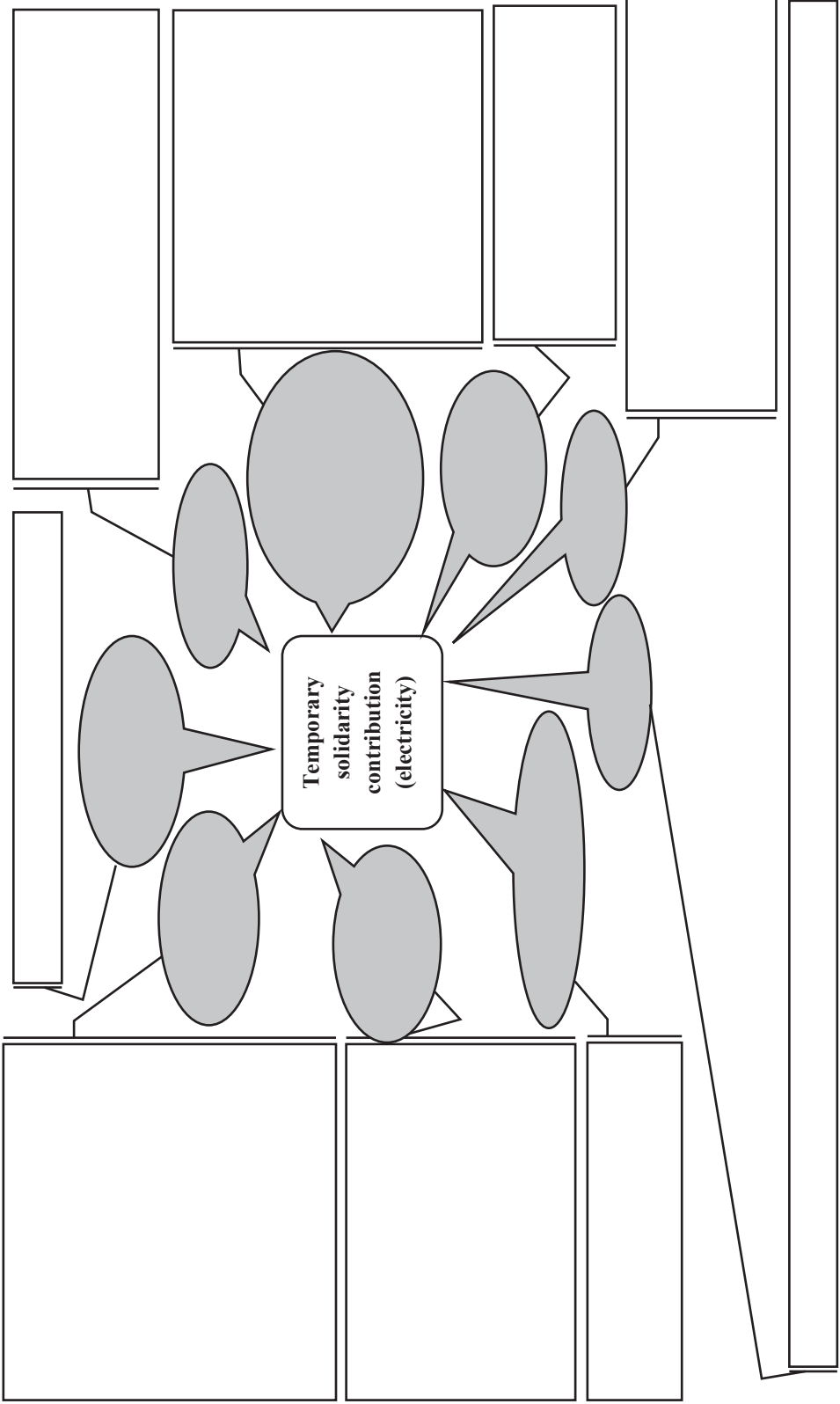


Fig. 4.2. Elements of the temporary solidarity contribution applicable to EU electricity generation entities
Compiled by the author on the basis of Regulation 2022/1854 [240].

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In addition to these exemptions at the national level, the following may be exempt from taxation:

producers who have generating facilities with an installed capacity of up to 1 MW;
producers generating electricity on hybrid installations using renewable and traditional energy sources (if there are risks of increasing CO₂ emissions and reducing the production of renewable energy).

Payment of the temporary solidarity contribution is not mandatory for Cyprus and Malta. However, should Cyprus decide to implement this mechanism, the price cap will not apply to electricity produced from crude oil products.

According to the decision of the EU member states, income from the sale of electricity received from the sale of electricity on the balancing energy market and from compensation for redistribution and counter-trade may not be included in the object of taxation. In addition, at the national level, it may be decided not to include in the object of taxation the revenue from the sale of electricity produced in small isolated systems or small connected systems.

A tax threshold that defines the market income limit should not jeopardize the ability of producers to recoup their investment and operating costs, and should preserve and encourage future investment in the capacity needed to create a carbon-neutral and reliable electricity supply system. The price cap is set at the level best suited to maintaining the functioning of the internal electricity market, as it supports price-based competition between electricity producers using different technologies, in particular renewable energy sources. This level allows you to withdraw excess profits of companies that, due to the peculiarities of the technology used, have lower marginal costs and remove from taxation technologies with high marginal costs due to the high price of incoming fuel (for example, gas or coal). According to Art. 8.1. EU member states have the right to:

- maintain or introduce measures that further limit the market income of electricity producers from the sources listed in the list, including the possibility of differentiation between technologies;
- to establish a higher limit of market revenues for producers who produce electricity from sources included in the list, provided that their investment and operating costs exceed the possibilities, which gives the price ceiling;
- support or implement national measures to limit the market income of producers who produce electricity from sources not specified in the list;
- to establish a certain limit of market revenues received from the sale of electricity produced from hard coal;
- impose market revenue limits on non-reservoir hydropower plants or maintain or introduce measures that further limit their market revenue, including the possibility of differentiation between technologies.

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The ability to set the contribution rate at the level of 90 % is due to the creation of an opportunity for producers to receive 10 % of excess income over the established limit.

The majority of EU member states have developed and implemented national legislation on the temporary solidarity contribution for companies in the electricity generation sector. However, in connection with the broad powers of national authorities, there is a significant national specificity of this contribution.

A specific characteristic of this payment is the possibility of differentiated marginal prices for energy produced by different generation technologies. This approach allows stimulating the development of non-carbon technologies due to the appropriate differentiation of the tax burden. So, for example, in *France* (where this payment was introduced retroactively from July 1, 2022 and is applied until December 31, 2023 inclusive, it is called “temporary contribution on the inframarginal rent of electricity producers”) the marginal price per MWh equal to EUR 90 for nuclear energy, EUR 100 for wind energy, EUR 145 for waste incineration, etc. Market income in excess of the threshold price is taxed in *France* at a rate of 90 % [193].

The duration of the tax periods is set artificially and is not equal: the first period – from July 1 to November 30, 2022 (5 calendar months), the second – from December 1, 2022 to June 30, 2023 (7 months), and the third - from July 1 2023 to December 31, 2023 (semi-annual) [59]. French electricity generating companies must declare the contribution according to their own VAT return regime, i.e. in the annual VAT return or in an annex to the monthly or quarterly VAT return. The contribution is paid: no later than July 25, 2023 for the first tax period and July 25, 2024 for the second and third periods. In addition, taxpayers must pay in 2023 part of the contribution due for the second and third tax periods, that is, a partial advance payment of the solidarity contribution is provided for.

From July 6, 2023, *Latvia*, which introduced national regulation of this type of solidarity contribution in December 2022, made significant changes to the procedure for taxation of electricity generating companies. On the one hand, the tax threshold has been retrospectively increased to the “standard level” – 180 EUR per MWh. It applies to the market income received by qualified producers from the production of electricity between December 1, 2022 and June 30, 2023 (the first tax period). On the other hand, the tax base has been largely liberalized, from which excess income invested in own companies or related enterprises is excluded, in order to stimulate investments in decarbonization technologies, renewable energy sources and energy efficiency [118].

In *Luxembourg*, in 2023, a 90 % tax on excess profit from the sale of energy will be introduced for electricity companies [80]. 90 % of the revenue of electricity suppliers that exceeds the mandatory limit for electricity will be subject to taxation. The applicable restrictions are as follows:

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- 100 EUR per MWh of hydroelectric power;
- EUR 130 per MWh for wind energy, solar energy, municipal and industrial waste and gas from water treatment facilities;
- 180 EUR per MWh for fuel from solid biomass or wood scrap and biogas.

The windfall tax will apply retroactively from December 1, 2022 to December 31, 2023.

Taxation of excess profits of companies in the field of electricity, introduced from December 1, 2022 to December 31, 2024 in *Slovakia* [400] provides for the introduction of a special contribution in the amount of 90 % of the excess profit from energy production. Surplus profit is calculated as the difference between the market price and the maximum price level established by special Government regulations in the range of 50–250 EUR for 1 MWh of electricity, depending on the source of its production. Such a serious differentiation of marginal types of prices will contribute to the possibility of reducing the tax burden on generating companies that use renewable sources for energy production.

The levy does not apply to companies with small production capacities (0.9 MW or less), some hydroelectric plants and biomethane electricity producers, or are facilities for the production of electricity from renewable energy sources with highly efficient combined production (the legislation provides a sufficiently detailed list of conditions application of such exemption).

Another model of excess profits tax based on “standard” principles has been applied in Sweden since March 2023 for the taxation of electricity generating companies [339]. Payers of the contribution are defined as electricity producers – any companies that produce electricity in *Sweden* from one of the sources listed in Art. 7. Regulations. In addition, the electricity must be produced in a power station with a total installed generator capacity of more than 1 MW – or more than 1 MW of inverter capacity in the case of solar thermal or photovoltaic. The chosen tax base is the profit from the sale of electricity at a price that exceeds the established price threshold – 1.957 SEK (~ 167 EUR) per MWh (which is slightly lower than established by Article 2(9) of Regulation No. 2022/1854 of October 6, 2022 year level – 180 EUR), and the rate is 90 %.

In *Austria*, where the structure of the contribution mainly meets the requirements of the Regulation [240], the threshold for the application of the solidarity contribution from energy generating companies has been reduced from 140 to 120 EUR per MWh from June 1, 2023 [272], which increases the tax base and the amount of income from this contribution.

Solidarity contribution for companies in the electricity generation sector in *the Netherlands* (inframarginale elektriktishheffing) [409] was introduced to curb excess profits of companies obtained from the supply of electricity in violation of established price restrictions.

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A contribution is provided for electricity producers in respect of the market income they receive from electricity produced in *the Netherlands* (or on the Dutch continental shelf) by means of production facilities with an installed capacity of at least 1 megawatt (MW) which are connected to the electricity grid or direct line.

The contribution rate is set at the “standard” level – 90 % of the difference between the actual amount of electricity sales at market prices and the estimated amount of conditional revenue at marginal prices.

The exempted amount (limit price) is 240 EUR per MWh for electricity produced with biomass fuel and 130 EUR per MWh for other types of electricity.

The contribution is payable monthly between December 1, 2022 and June 30, 2023.

Finland's alternative approach is to introduce a temporary income tax of 30 % for companies that produce and sell electricity [130]. The purpose of the tax is to cut into the current extremely high profits of electricity companies. The tax base is defined as profit exceeding 10 % of the profit calculated on the amount of equity used for the electricity business. This contribution is made in addition to the income tax payable on corporate profits and will not be deductible for corporate income tax purposes. Small electricity enterprises and retailers of clean electricity will be excluded from the number of tax subjects. The production of centralized heat at cogeneration plants is also not subject to this contribution.

The United Kingdom, which is no longer part of the EU, has its own regime of taxation of companies that generate electricity, and this regime differs significantly from the principles laid down by the Regulation [240]. This payment is called Electricity Generation Tax (EGL). The lawmaker introduced the EGL because some British companies were making big profits from higher wholesale electricity prices. Parts of the UK electricity generation sector – mainly those using renewable sources – have benefited from higher wholesale prices, but without increasing costs. EGL [77] applies to generating companies with a capacity of more than 50 GWh per year. A 45 % levy will be levied on their exceptional income (net of generation fuel costs) in excess of GBR 10 million per annum. The collection will handle the wholesale sales of electricity by producers of nuclear energy, renewable energy sources, biomass and waste [53]. That is, according to its design, the new levy corresponds to the classic design of sales taxes and is only indirectly related to surplus profits. In contrast to the approach of the EU, where member states introduced a similar temporary contribution for 1–2 years, in Great Britain it is planned for the period from January 1, 2023 to March 31, 2028. The exceptional income from generation is calculated as income above the base price in GBR 75 per megawatt-hour, which was achieved in the UK electricity market before the energy crisis and the Russian invasion of Ukraine. The base price will be adjusted annually according to the consumer price

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index. The EGL may be terminated if wholesale prices return to historical levels by March 2028.

A certain analogue of the European temporary contribution of solidarity may be proposed by the US Senate in accordance with the IRA changes to the taxation regime of large oil companies (“Big Oil”) [413] defined as a company that has average annual gross receipts for the 3 taxable years ending with the taxable year immediately preceding such taxable year equal to or greater than \$1 billion and that is principally engaged in one or more oil or natural gas transactions or business during the taxable year.

This special mode involves the use of three components:

- an additional tax of 21 % on excess profits of oil and gas companies with an annual income of more than 1 billion US dollars. Surplus profit is calculated by subtracting normal profit – 10 % return on costs – from current profit;
- 25 % excise tax on the buyback of shares;
- impossibility of using the LIFO inventory method.

Thus, the temporary solidarity contribution made by electricity producers is widely used in modern taxation practice and differs quite seriously in different countries. In general, solving the task of redistributing income and creating a financial basis for the implementation of other measures to combat the consequences of the energy crisis, it has different regulatory capabilities and fiscal efficiency due to national specifics.

The introduction of a windfall tax for Ukraine can be interesting and promising, based on the following arguments:

firstly, the solidarity contribution can be considered as an additional source of investment financing, which is especially important at the stage of Ukraine’s post-war recovery. Of particular importance is the fact that in this case we are talking about an additional source for public investment, the sources of financing of which are critically limited [143];

secondly, the fundamental point is the internal nature of this source of investment financing, which reduces the investment burden on loan funds, funds of foreign investors and international organizations. This requirement corresponds to Clause 22 of the Memorandum on Economic and Social Policy [210].

thirdly, the implementation of the windfall tax has a positive effect on ensuring the fairness of taxation, which corresponds to the principles of the construction of the National Revenue Strategy for 2024–2030 announced by the CMU. [297]. The first of such principles, Clause 4 of the Protocol, is declared to ensure the achievement of the principle of justice in the period after the termination or abolition of martial law through the use of the distributive role of taxes;

fourth, taxes on solidarity, like taxes on net wealth, can encourage investment in more productive assets. This is a positive point given that taxpayers of such

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taxes may prefer to invest in (higher) income generating assets. At the same time, investment activity will move from those types of activities that are subject to the windfall tax to other, less burdensome, from the point of view of the tax burden, types of activities. The consequence of such a process is a change in the structure of investments by the form of ownership in favor of the private sector.

fifth, the European integration vector of Ukraine's development objectively requires the approximation of Ukrainian tax legislation to EU norms and rules. Although the implementation of the solidarity contribution is not regulated by the EU Directive, the adopted recommendations are used by the vast majority of EU countries, and one of the principles laid down in the National Revenue Strategy Framework is "the maximum approximation of tax and customs legislation to the requirements of international standards and ensuring the fulfillment of obligations arising from membership of Ukraine in international organizations";

sixth, the implementation of the European experience of solidarity contributions is facilitated by the fact that the EU has accumulated some experience in the methodical provision of these specific taxes, in the 3rd quarter of 2023 it is planned to generalize the practical results of their implementation.

Weaknesses and problematic points of using the concept of tax on unpredictable incomes in the conditions of Ukrainian realities are seen in the following.

Windfall taxation, like any other solidarity taxes, is associated with double taxation, as it is applied in parallel with traditionally applied direct and indirect taxes. That is, unforeseen excess income will be both the object of ordinary corporate income tax and the object for calculating the solidarity contribution.

The imposition of solidarity taxes in a single country can cause capital outflows, as the cross-border mobility of capital (especially financial assets) is quite high. This may be the reason for the flow of investments within the multinational corporation to divisions located in countries where the tax on windfall profits is not met.

Limited reserves of natural gas and oil may become a significant problem for the introduction of windfall taxes in Ukraine, although a certain potential may be associated with the restoration of production capacities in the field of coal mining. This problem concerns the taxation of windfall profits in the field of energy extraction and will not be decisive in the case of establishing other objects of taxation.

The solidarity tax threshold of 20 % may be acceptable for a stable economy. In war conditions, after a significant fall and decrease in profit volumes in 2022, the pace of recovery of financial indicators levels may exceed the established threshold, but this will not at all mean the presence of unpredictable profits due to cyclical factors. Therefore, in the case of a decision on the implementation of the solidarity tax in Ukraine, one of the most important issues will be the justification of the acceptable level of the solidarity tax taxation threshold.

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The basis for calculating the rate of profit growth in the EU is the average annual profit for four years, which is also acceptable for a stable economy that is not vulnerable to wartime shocks. In our opinion, this length of the period for calculating the average annual profit cannot be used during the period of military operations, which cause significant volatility in the financial results of economic activity. Relocation of enterprises also has negative consequences for financial indicators, and enterprises newly created during the recovery period of the Ukrainian economy will mostly have a very short history, which makes it difficult for them to apply standard EU approaches.

The current procedure for calculating profit, including for the purposes of the solidarity tax, does not contain effective mechanisms for countering the artificial reduction of the tax base, including due to increased costs. Therefore, in modern conditions, the introduction of a tax on unforeseeable profits in Ukraine without the use of special preventive mechanisms for countering the overestimation of costs and minimizing the size of such profits is quite debatable.

Thus, the use of solidarity taxes, and especially the tax on unforeseen profits, can be a promising way to create one's own national sources of financing investments in the conditions of post-war economic recovery, which can really be qualified as a project aimed at the solidarity of society, and the recovery period itself has certain temporary limitation.

At the same time, the use of such an approach requires the adaptation of the European WPT methodology to the specifics of the goals and conditions of taxation in Ukraine, as well as the scientific justification of restrictions on the application of the solidarity tax and preventive mechanisms for countering its implementation at the stage of Ukraine's post-war recovery.

4.2. Current trends of VAT harmonization in the EU countries

The implementation of a universal excise tax in the form of value added tax (VAT) is required for membership in the European Union (EU). The EU is harmonizing VAT collection to facilitate trade between EU member states, reduce tax fraud, and avoid double taxation. Although this tax is the most unified, the system of its collection in the EU can be described as “semi-harmonized.” This is due to the fact that the EU has set out guidelines for implementing VAT policy, but member states have set limits on the application of certain elements of the tax. For instance, the current VAT legislation allows member states to apply a minimum VAT rate of 15 %. However, they can apply reduced rates for certain goods and services or temporary exemptions from the general VAT policy.

For an extended period, the regulations governing the collection of VAT were established by the Sixth EU Directive 77/388/EC of 17.05.1977 on the harmonization of the laws of the Member States in the field of turnover taxes [8]. Currently, the collection of this tax is regulated by the Council of Europe Directive 2006/112/EC of 28 November 2006 on a common system of value added tax [41]. In addition, Council Directive 2008/9/EC of 12.02.2008 [45] establishes detailed rules for VAT refunds for businesses registered in the EU, Council Directive 86/560/EEC [381] regulates VAT refunds for businesses registered outside the EU, Council Directive 2009/132/EC [46] establishes exemptions from VAT on final imports of certain goods, Council Directive 2006/79/EC [42] provides for tax exemption on imports of small consignments of goods of a non-commercial nature from third countries, and Council Directive 2007/74/EC [43] establishes exemptions from value added tax and excise duty on goods imported by persons traveling from third countries. The legislative standards outlined in these directives govern both the VAT collection procedure for firms registered in the EU and the rules for enterprises registered outside the EU trading with the EU. Every member state bears the responsibility of incorporating these provisions into national law and applying them correctly on its territory, as it is obliged to implement measures adopted at the EU level.

During the analysis of harmonization of VAT administration policy within the EU, it is essential to consider the following aspects:

- harmonisation of general approaches to VAT administration;
- harmonisation of approaches to VAT administration for business;
- harmonisation of approaches to the collection of VAT from individuals.

Within the context of harmonising common approaches to VAT administration, EU member states focus on territorial criteria for the application of VAT; taxpayer status; objects of taxation; place of taxable transactions; date of tax liabilities; tax

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base; basic rules for determining tax rates; exempt transactions; rules and criteria for reducing tax liabilities. In contrast, harmonisation of approaches to VAT administration for business, in addition to the general approaches listed above, encompasses the following key aspects: harmonisation of VAT-related administrative obligations; special schemes for certain taxpayers or transactions; VAT invoicing; rules and criteria for tax refunds. The harmonisation of approaches to the collection of VAT from individuals also includes the unification of VAT refunds to tourists, the purchase and sale of cars by citizens and online purchases.

The European Commission (EC) is the major entity responsible for designing methods to VAT administration in member states at the EU level. It has the following bodies: The VAT Committee, the VAT Expert Group, and the VAT Future Group. The VAT Committee was established in 1977 in accordance with Article 398 of Council Directive 2006/112/EC to promote the uniform application of the provisions of this Directive. The VAT Committee operates as an advisory entity. It does not possess legislative authority. Its role is centered around providing advice and recommendations. It is empowered to issue specific guidelines pertaining to the implementation and interpretation of the VAT Directive. For example, certain provisions of Council Directive 2006/112/EC require Member States to consult with the VAT Committee before implementing the opportunities provided by the Directive in their national legislation. The VAT Committee also considers the application of EU VAT provisions adopted by the EC or a Member State. Based on the results of its deliberations, the VAT Committee may agree on recommendations on specific issues. The directives of the VAT Committee are of an advisory nature. They do not constitute an official interpretation of EU law and are not always subject to approval by the EC. Therefore, the Committee's recommendations are not binding on the EC or the Member States.

On June 26, 2012, the EC adopted Decision 2012/C 188/02 [33] establishing a group of experts on value added tax – the VAT Expert Group. The task of the group is to advise the Commission on the preparation of legislation and other policy initiatives in the field of VAT and to provide recommendations on the practical implementation of the EU legislation and other policy initiatives in the field of VAT. The maximum number of members in the group is forty. Members of the group consist of both organizations and individuals, selected for their individual merits and proficiency to effectively undertake the assigned responsibilities. The organisations that make up the group represent businesses and tax professionals who can assist in the development and implementation of VAT administration policies. The EC may grant observer status to individuals or organisations and, on a case-by-case basis, invite them to attend meetings of the VAT Expert Group on issues of interest to them. Throughout its operational tenure, the Group has adopted a number of decisions and conclusions, the most important of which are:

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- opinion on the Definitive VAT regime for the taxation of B2B supplies of goods within the EU (12 June 2014) [257];
- opinion on Cross-Border Rulings (31 March 2015) [255];
- statement of the VAT Expert Group on the Work on the Definitive VAT system (20 May 2016) [256];
- conclusion on the work on the final VAT regime (23 September 2016) [354].

These conclusions formed the basis for amendments to the current rules of VAT administration in the EU.

Alongside the aforementioned entities engaged in the coordination of VAT administration within the EU, the Group on the Future of VAT (GFV) also exists. This expert group was established by the EC to serve as a platform for engaging with EU member states in discussions regarding initial legislative proposals. The GFV is composed of representatives of national tax administrations. Since its establishment, the group has successfully convened for a total of forty meetings [117], which resulted in a number of important decisions on the unification of VAT administration approaches across the EU. The activities of the GFV hold particular significance in the context of pinpointing deficiencies in the operation of this tax at the EU level, as the GFV includes representatives of tax administrations from different countries with practical experience in VAT collection. Through the process of identifying areas of concern, the GFV assumes the role of a catalyst for instigating adjustments in VAT administration at the EU level.

The process of VAT harmonization at the EU level began in the late 1960s, but the so-called Sixth Council Directive (77/388/EEC), which became fundamental to the creation of a harmonized VAT system, was adopted on May 17, 1977. It has served as the basis for establishing a comprehensive set of uniform rules that are essential for defining the taxable entities and the methodology employed to calculate the taxable amount. Furthermore, it has contributed to addressing various additional aspects associated with the implementation of this tax. A pivotal aspect in the establishment of this standardized system was the determination of the fundamental principle that underpins trade among EU member states. From a theoretical standpoint, two distinct principles emerge: country of origin and country of destination. The former implies taxation of supply transactions in the country of the seller (export taxation and import exemption), while the latter entails taxation in the buyer's country (import taxation and export exemption). Obviously, opting for the country-of-origin principle carries the inherent risk of potentially distorting trade dynamics among nations due to variations in taxation levels. In other words, it will become advantageous to buy goods from countries with lower VAT levels. This situation will put pressure on countries with higher taxes to reduce them, which may be difficult or even unacceptable for many of them. Consequently, embracing

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the country-of-origin principle for intra-EU trade VAT could yield a scenario akin to domestic trade within a single nation. Furthermore, such an approach would be at odds with articles of the Treaty on the Functioning of the European Union, which emphasize the importance of upholding the tax sovereignty of individual member states. Consequently, within the EU, taxation was based on the principle of the country of destination.

Despite these arguments, in 1987, the EC introduced a proposal suggesting that the envisioned future single market of the EU should adhere to the principle that goods traded within the Community ought to be subject to taxation based on the rules and rates of the originating country. The EC 's goal was to create a system similar to that of a single country, bringing the Community closer to a single economic area. Nonetheless, this proposition was met with non-acceptance from the Member States, primarily because its implementation would have meant a significant reduction in the existing differences in national VAT rates. Given the absence of a mutually agreed-upon consolidated VAT framework within the stipulated timeframe, the decision was reached to persist with the option of country-of-destination taxation. [262, p. 96].

It should be noted that with the creation of the single internal market in 1993 and the abolition of border controls on trade in the EU, it was envisaged that the application of the destination principle would be a transitional system of VAT collection. The long-term vision was for a finalized system to be rooted in the application of the taxation principle aligned with the regulations of the originating country.

Consequently, the VAT system, which has been instituted within the EU since 1993, has effectively been in operation for over twenty-five years. During the period of operation of this system on the basis of the country of destination, notable modifications have been implemented regarding the approaches to determining the tax base and the list of goods and services subject to reduced taxation. Nevertheless, they did not change the essence of the system. Two distinct transactions are taking place in commerce between firms from different member states. The first involves a zero rate of intra-Community tax in the seller's Member State, and the second involves the purchase of intra-Community goods that are taxed in the buyer's Member State at the applicable rates. The fact that under this system, sales in another Member State generally do not trigger a VAT liability for the seller's company has been a factor contributing to intra-EU fraud, and the complexity of the system continues to be a factor hampering intra-EU trade.

Hence, we posit that one of the reasons for initiating new approaches to VAT administration in the EU is the high level of VAT revenue gaps. "The VAT gap" is the difference between expected and actual VAT revenues collected in EU member states. In simpler terms, it quantifies the shortfall in VAT revenues compared to the

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theoretical calculation of this tax. The primary factors contributing to the VAT gap can be grouped into four broad sets [397]:

- 1) fraud and VAT evasion.
- 2) VAT evasion and optimisation practices.
- 3) bankruptcy and financial insolvency.
- 4) administrative errors.

Each of these factors requires other fiscal policy measures. However, even under the best of circumstances, the VAT gap cannot be completely closed, for example, due to VAT losses from bankruptcies and financial insolvency.

Monitoring the VAT gap holds significance for various reasons:

- it measures the efficiency of VAT collection by national tax administrations;
- lost VAT revenues have an extremely negative impact on the financing of public goods and services. Maximizing VAT revenues is also important for covering the debt of member states incurred during the initial recovery from the COVID-19 pandemic;
- VAT not only generates tax revenues for national budgets but is also a source of revenue for the EU budget. Therefore, it is very important to work at the EU level to improve VAT collection and reduce VAT gaps;
- quantifying the scale of the VAT gap can help to develop targeted measures to reduce this phenomenon and monitor their effectiveness.

According to the European Commission's report on the EU VAT gap published in 2021 [282], EU member states lost approximately €134 billion in VAT revenues in 2019, or 10.3 % of VAT Total Tax Liability (VTTL). In 2019, Value Added Tax (VAT) revenues experienced a growth of 3.8 %, while the VAT Tax Liability (VTTL) exhibited a 2.9 % increase. In contrast to 2018, the gap exhibited a decline of roughly 0.8 %, equivalent to approximately EUR 6.6 billion (Table 4.7).

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Table 4.7. VAT gap as a percentage of accrued tax liabilities and in EUR million in the EU-28 in 2018 and 2019

Country	2018				2019				Change in the VAT gap in 2019 compared to 2018 (%)
	Revenues	VAT Total Tax Liability	VAT gap	VAT gap (%)	Revenues	VAT Total Tax Liability	VAT gap	VAT gap (%)	
1	2	3	4	5	6	7	8	9	10
Belgium	31.053	35.060	4,007	11.4 %	31.702	36.146	4.444	12.3 %	0.9
Bulgaria	5.097	5.714	617	10.8 %	5.628	6.136	508	8.3 %	-2.5
Czech Republic	16.075	18.642	2.567	13.8 %	16.931	19.766	2.835	14.3 %	0.6
Denmark	29.137	31.653	2.516	7.9 %	29.632	32.410	2.778	8.6 %	0.6
Germany	235.130	259.421	24.291	9.4 %	244.111	267.554	23.443	8.8 %	-0.6
Estonia	2.331	2.428	98	4.0 %	2.483	2.599	116	4.5 %	0.4
Ireland	14.175	15.716	1.541	9.8 %	15.281	17.002	1.721	10.1 %	0.3
Greece	15.288	21.525	6.237	29.0 %	15.390	20.740	5.350	25.8 %	-3.2
Spain	77.536	82.788	5.252	6.3 %	79.308	85.148	5.840	6.9 %	0.5
France	167.720	182.148	14.428	7.9 %	173.953	187.811	13.858	7.4 %	-0.5
Croatia	6.949	7.501	553	7.4 %	7.419	7.497	77	1.0 %	-6.3
Italy	109.333	141.748	32.415	22.9 %	111.533	141.639	30.106	21.3 %	-1.6
Cyprus	1.817	1.988	171	8.6 %	1.943	1.998	54	2.7 %	-5.9
Latvia	2.449	2.726	277	10.2 %	2.632	2.869	237	8.3 %	-1.9
Lithuania	3.522	4.660	1.137	24.4 %	3.850	4,898	1.048	21.4%	-3.0
Luxembourg	3.563	3.896	333	8.5 %	3.763	4.030	267	6.6 %	-1.9
Hungary	12.950	14.210	1.261	8.9 %	13.916	15.398	1.483	9.6 %	0.8
Malta	920	1.123	203	18.1 %	934	1.221	287	23.5 %	5.4
Netherlands	52.712	55.751	3.039	5.5 %	58.131	60,791	2.660	4.4 %	-1.1
Austria	29.323	32.356	3.033	9.4 %	30.405	33,301	2.895	8.7 %	-0.7
Poland	40.423	45.711	5.288	11.6 %	42.383	47.762	5.379	11.3 %	-0.3
Portugal	17.868	19.627	1.759	9.0 %	18.786	20.395	1.609	7.9%	-1.1
Romania	12,890	19.148	6.258	32.7 %	13.795	21.206	7.411	34.9 %	2.3
Slovenia	3.765	3.928	163	4.1 %	3.888	4.186	298	7.1 %	3.0
Slovakia	6.319	7.734	1.414	18.3 %	6.830	8.143	1.313	16.1 %	-2.2
Finland	21.364	22.248	884	4.0 %	21.974	22.620	646	2.9 %	-1.1
Sweden	43.403	44.886	1.483	3.3 %	43.412	44.009	597	1.4 %	-1.9
United Kingdom	168.703	188.538	19.835	10.5 %	176.317	193.493	17.176	8.9 %	-1.6
Total EU-28	1.131814	1272872	141.059	11.1 %	1.176331	1310768	134.436	10.3 %	-0.8
Average				9.4 %				8.6 %	

Source: [282, p. 28].

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The smallest gaps were observed in Croatia (1 %), Sweden (1.4 %), and Cyprus (2.7 %), while the largest gaps were observed in Romania (34.9 %), Greece (25.8 %), and Malta (23.5 %). In absolute terms, the largest gaps in VAT collection were recorded in Italy (€30.1 billion) and Germany (€23.4 billion). In half of the EU-28 member states, the gap was above 8.6 %. In most Member States, the annual change in the VAT gap was less than 2 %. Overall, the VAT gap narrowed in 18 Member States. In addition to Croatia, Sweden and Cyprus, the most significant reduction in the VAT gap occurred in Greece, Lithuania, Bulgaria, and Slovakia (3.2 –2.2 % reduction in the VAT gap). In Sweden, Finland, and Estonia, the loss of VAT revenues has been consistently estimated at less than 5 % of VAT collected over the years. The largest increase in the VAT gap, apart from Malta, was observed in Slovenia (+3 %) and Romania (+2.3 %).

Consequently, the analysis indicates a general trend of narrowing VAT gaps across EU member states. Nonetheless, variations persist, with certain countries experiencing increases while others observe decreases. It's important to note that this analysis primarily covers the year 2019, thus offering limited insight into the impact of the COVID-19 pandemic. Therefore, we assume that the VAT revenue gap will show more negative trends in 2020–2021. In this regard, we believe that the factor of the VAT gap becomes even more relevant in making decisions on changing the system of administration of this tax at the EU level.

A shift in the approach to formulating initiatives for the ultimate VAT administration system has been evident since 2012. This transformation was notable in May 2012, during the meeting of the Economic and Financial Affairs Council (ECOFIN), where EU member states recognized that, due to political considerations, the feasibility of implementing the country-of-origin principle in VAT collection was improbable [39]. This led to a change in the European Commission's attitude to the issue of establishing the principle of VAT collection at the EU level. Thus, in 2016, the EC introduced an action plan aimed at designing a definitive VAT system. Notably, this new proposal advocated for the adoption of the country of destination principle as its foundation [84].

An important decision at the EU level to establish a new VAT administration system was made by the EC in the form of amendments to Directive 2006/112/EC on value added tax rates (COM (2018) 20 final), which were presented on January 8, 2018. These amendments provided Member States with more opportunities to apply reduced rates. Thus, it is envisaged to apply two reduced VAT rates of at least 5 % and, as a derogation from the general rule, one reduced rate below 5 %. Simultaneously, it is incumbent upon Member States to ensure that the weighted average VAT rate consistently exceeds 12 %.

In addition, the Proposal for a Directive amending Directive 2006/112/EC laying down detailed technical measures for the operation of a final VAT system for

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the taxation of trade between Member States (COM(2018) 329 final), submitted by the EC on May 25, 2018, is of key importance for the establishment of the final VAT system [289]. The adoption of the proposed amendments provided for the cancellation of the transitional provisions in force since 1993 and the introduction of a new final VAT system for intra-EU trade as of July 1, 2022. Its essence is that the division of cross-border supplies of goods between businesses into two different transactions for VAT purposes will cease to exist. The EC has proposed that the supply of goods between businesses from different EU countries should constitute a single transaction for VAT purposes, which would be the supply of goods within the EU. From July 1, 2022, supplies of goods between businesses from one Member State to another would constitute an “intra-EU supply” subject to VAT at the rate of the Member State of destination. Under the new system, the seller is liable for VAT in the Member State of destination unless the buyer has the status of a so-called “certified taxpayer”. In the case of sales between companies from different EU countries, the VAT rules are similar to those already in place for distance sales to individuals, which are taxed in the Member State of destination. In general, under the new system, companies must register as VAT payers in all Member States of destination and pay VAT to their tax authorities if their customers are not certified taxpayers.

This approach somewhat complicates the VAT administration process in the new system. Therefore, to avoid the need for a company to register as a taxpayer in each country, a new “One Stop Shop” (OSS) system has been created, which provides for registration in its member state. This is a continuation of the mini-one-stop shop for electronic services that has been in place since January 2015. The new OSS system allows businesses to file a VAT return and make payment in one Member State without having to be identified as a VAT payer in all Member States where they are liable to pay VAT on intra-EU supplies. VAT amounts paid to a particular country that have been collected through a single window system located outside its territory will then be transferred to that country. This will allow a buyer from another member state, who will be granted the status of a “certified taxpayer”, to calculate VAT on purchases of goods within the EU. Consequently, this relieves the seller from the duty of collecting the tax.

The decision to implement the aforementioned VAT administration system has received both positive feedback and criticism from EU member states’ governments and academia. Thus, the report of the Economic and Financial Affairs Council (ECOFIN) dated June 5, 2020 states that the majority of member states expressed endorsement for the transition to a unified single transaction approach for intra-EU trade, replacing the existing dual-transaction structure. However, they raised objections about the introduction of the concept of a “certified taxpayer”, as well as against the application of different VAT accounting rules contingent upon the client’s certified taxpayer status.

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According to E. Wilson, the final VAT system proposed by the European Commission is primarily designed to reduce cross-border fraud [410]. At the same time, the author emphasizes that the proposed VAT administration system harbors notable limitations. Among them, E. Wilson highlights the costs of using this system that small and medium-sized enterprises may face.

A. Jones sees the planned alterations in the EU VAT system as a positive development, reducing the administrative burden for multinational companies operating across multiple jurisdictions. However, at the initial stages of implementation, these changes may create difficulties for large companies concerning the necessity to adjust their supply chains [151].

E. Jansen examines the problem of combining the new rules on VAT harmonization at the EU level with the domestic legislation of the member states. The author considers that the combination of harmonized EU legislation and national legislation on the introduction of the new VAT system presents a challenging proposition [150].

The presented analysis shows that the EU member states, and the academic community have mixed reactions to the initiatives to introduce a new VAT administration system. Therefore, the final decision on this issue was slated for July 1, 2022. Our viewpoint underscores that the introduction of the new VAT administration system will depend on the effectiveness of the VAT practice for cross-border business-to-consumer (B2C) e-commerce, which was introduced on July 1, 2022. This practice mirrors the suggested ultimate VAT administration system and is based on the registration of a taxpayer in one EU member state. Furthermore, we maintain that the decision to introduce a new VAT administration system at the Community level will be influenced by the war between Russia and Ukraine. The sanctions imposed by EU countries on goods from Russia create a need for diversification in commodity markets. As a result of the sanctions, some companies registered in the EU stopped producing goods, selling them, and providing services in the aggressor country. This causes a change in trade flows at the community level and affects the pricing policies of such companies. The changes described above are unprecedented for the EU market and will cause significant fluctuations in supply and demand on the global market in general and in the EU in particular. In such a situation, the introduction of a new VAT administration system would require careful consideration and timing to ensure a harmonious and effective transition.

In order to assess the possible prospects for the implementation of the new VAT administration system, it is prudent to delve into the particulars of the new rules for the collection of VAT on cross-border business-to-consumer (B2C) e-commerce transactions. On July 1, 2021, a number of amendments to Directive 2006/112/EC came into force that affect the VAT rules applicable to cross-border business-

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to-consumer (B2C) e-commerce. The Council of Europe adopted these rules by Directive 2017/2455 in December 2017 and Directive 2019/1995 in November 2019. The amendments are justified by the need to overcome barriers to cross-border online sales, as stated in the 2015 Communication from the European Commission “Digital Single Market Strategy for Europe” [37] and the 2016 Communication on the VAT Action Plan “Towards a single EU VAT area – Time to decide” [84]. More specifically, the introduced amendments target the resolution of issues intertwined with the VAT framework governing the distance selling of goods and the importation of low-value consignments. These amendments aim to address the following challenges:

- EU businesses conducting online sales to end consumers located in other Member States had to register and pay VAT in the consumer’s Member State when their sales exceeded the distance selling threshold, i.e., EUR 35,000/100,000. This imposed a substantial administrative load on traders and impeded the growth of cross-border online commerce within the EU;

- VAT exemption was provided for imports of low-value goods up to EUR 22, which led to abuse, resulting in Member States losing part of their tax revenues;

- businesses that were registered outside the EU and sold goods from third countries to consumers in the EU could execute deliveries to the EU without VAT and were not obliged to register as VAT payers. Such businesses had a clear commercial advantage over their competitors registered in the EU.

The newly introduced regulations put EU businesses on an equal footing with non-EU businesses that were not required to charge VAT under the rules in force before July 2021, simplified VAT administration for companies engaged in cross-border e-commerce and deepened the EU Single Market. The main changes are as follows:

- given the success of the Mini One Stop Shop (MOSS) VAT administration system, which allows providers of telecommunications, broadcasting and electronic services to register as VAT payers in one Member State and keep records of VAT paid in other Member States in that State, this system has been extended to other B2C services, to distance sales of goods within the EU, as well as to certain internal supplies of goods, leading to the extension of the One Stop Shop (OSS);

- the existing threshold for intra-Community distance sales of goods is abolished and replaced by a new pan-European threshold of €10,000. Below this threshold, telecommunications, broadcasting and electronic services and the distance selling of goods within the EU remain subject to VAT in the Member State where the taxpayer is registered or where the goods are located at the time of the commencement of their dispatch or transport;

- special provisions have been introduced, according to which a company facilitating deliveries via an online electronic interface is considered for VAT purposes to have received and delivered the goods itself (“deemed to be a supplier”);

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– the VAT exemption for the import of small consignments of goods up to EUR 22 was cancelled, and a new special scheme for the remote sale of goods imported from third territories or countries with a domestic value of less than EUR 150, called the Import One-Stop Shop (IOSS), was created;

– initiatives have been implemented to simplify the remote sale of imported goods in batches not exceeding EUR 150 in case of non-use of IOSS (special measures);

– new VAT accounting requirements have been introduced for companies that supply goods and services via an electronic interface, including if the electronic interface is not considered a supplier.

Thus, the new provisions amend the existing special schemes for VAT administration set out in Directive 2006/112/EC (the non-EU scheme, the EU scheme) and add a new one (the import scheme). Table 4.8 provides an overview of the changes to the special schemes that will apply from July 1, 2021.

Table 4.8. Amendments to special VAT administration schemes introduced from 1 July 2021

Operations	Non-EU established taxable person/supplier		EU established taxable person/supplier	
	Special scheme	Need for an intermediary or tax representative	Special scheme	Need for an intermediary or tax representative
1	2	3	4	5
Supply of B2C services	Non-Union scheme (OSS)	NO	EU scheme	NO
Intra-Community distance sales of goods	EU scheme	NO	EU scheme	NO
Internal delivery via an electronic interface	EU scheme	NO	EU scheme	NO
Remote sale of imported goods from third countries or third territories in an amount not exceeding EUR 150	Import scheme (IOSS)	YES	Import scheme (IOSS)	NO

Source: [90, p. 32].

The recent regulations expand the scope of the special scheme previously applicable to non-EU taxpayers offering telecommunications, broadcasting, and electronic services (the non-EU scheme) to encompass all services rendered to non-taxpaying entities within EU member states, adhering to the country of destination principle. This means that from July 1, 2021, businesses not registered within the

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EU and that provide services to non-taxpayers (consumers) in the EU are relieved from the necessity to register for VAT in each Member State in which they provide services. Instead, the VAT paid on these supplies can be declared and paid in one member state (the so-called member state of identification) through the One Stop Shop (OSS, non-EU scheme).

The new rules, which apply from July 1, 2021, extend the scope of the EU scheme in two ways:

1. The range of supplies that can be declared in the EU scheme has been expanded.

2. The range of taxpayers (suppliers) authorized to utilize the EU scheme has been expanded.

The essence of the import scheme is that suppliers who sell goods dispatched or transported from a third country or third territory to customers in the EU may charge VAT on distance sales of imported goods up to a value of EUR 150 from the customer and declare and pay this VAT through the Import One-Stop Shop (IOSS). If the IOSS is used, the importation (release into free circulation) of goods of this value into the EU is exempt from VAT. The tax is paid by the customer as part of the purchase price.

Such a mechanism can now be applied due to the amendment of Directive 2006/112/EC as the part of a new legal provision (Article 14a), which provides that in certain circumstances, taxpayers who sell goods remotely through an electronic interface are deemed to make supplies independently and will be obliged to pay VAT on these sales (the so-called supplier provision). Thus, the concept of “electronic interface” is defined, which should be understood as an online marketplace, electronic platform, electronic portal, or any current and future technologies that will allow for electronic sales.

The advantages of the new approach to VAT administration under the above schemes include:

- consumers are expected to welcome the new rules, as they know that when they buy goods online from outside or inside the EU, the same VAT rate applies as for goods purchased in their home country – the new rules ensure that VAT is paid where the goods are consumed;

- EU-registered businesses will grow in a simplified, fair environment and be able to overcome barriers to cross-border online sales – the European Digital Single Market aims to make technology work for people in a fair and competitive digital economy;

- EU citizens will see an increase in government revenues – by increasing VAT payments and reducing VAT fraud, all member states will benefit.

Table 4.9 shows the types of goods supplied by the Import One-Stop Shop (IOSS) by online vendors and electronic interfaces.

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Table 4.9. Types of supply of goods covered by the Import One-Stop Shop (IOSS) in terms of online sellers and electronic interfaces

Online sellers	Electronic interfaces
1	2
<p>IOSS covers the sale of goods over a distance that:</p> <ul style="list-style-type: none"> • shipped or transported from outside the EU at the time of sale; • are sent or transported in batches with a total value of no more than EUR 150 (low-value goods), even if the order contains more than one item; 	<p>The electronic interface facilitates the sale of imported goods from a supplier that:</p> <ul style="list-style-type: none"> • shipped or transported from outside the EU at the time of sale; • are sent or transported in consignments with a total value of no more than EUR 150 (low-value goods); • is not subject to excise tax (as a rule, this applies to alcohol and tobacco products).
<ul style="list-style-type: none"> • is not subject to excise tax (as a rule, this applies to alcohol and tobacco products) 	<p>An electronic interface is deemed to have facilitated the sale of imported goods if it has enabled a buyer and a seller to come into contact through that electronic interface, where the end result is the sale of goods to that buyer</p>

Source: compiled by the author from: [8].

Both online sellers and electronic intermediaries started registering their businesses on the IOSS portal of any EU member state from April 1, 2021. If businesses are located outside the EU, they usually need to appoint an intermediary established in the EU to fulfil their VAT obligations under IOSS. The IOSS registration is valid for all distance sales of imported goods to EU customers.

In practical terms, online vendors and electronic interfaces are obligated to undertake specific actions defined by the IOSS rules (Table 4.10).

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Table 4.10. Functional responsibilities assigned to online sellers and electronic interfaces in the IOSS system

Online sellers	Electronic interfaces
1	2
<ul style="list-style-type: none"> • provide the information required for customs clearance in the EU, including the IOSS VAT identification number to the person declaring the goods for import into the EU; • show/display the amount of VAT to be paid by the EU buyer no later than when the order process is completed; • to ensure that VAT is collected from the buyer on the supply of all eligible goods with a final destination in an EU Member State; • ensure that the goods in question are sent in batches not exceeding €150; • if possible, indicate the price paid by the buyer in euros on the invoice; • submit a monthly electronic VAT return via the IOSS portal of the member state where the supplier is identified to IOSS; 	<ul style="list-style-type: none"> • cooperate with the actual seller of the product(s) to ensure that the EU customs office where the goods will be imported receives the information required for customs clearance in the EU, including the IOSS VAT identification number; • show/display the amount of VAT to be paid by the EU buyer no later than when the order process is completed; • to ensure that VAT is collected from the buyer on the supply of all eligible goods with a final destination in an EU Member State; • ensure that the goods concerned are shipped in batches that do not exceed the €150 threshold, even if this total is only reached for a few items; • if possible, indicate the price paid by the buyer in euros on the invoice;
<ul style="list-style-type: none"> • pay the VAT declared in the VAT return to the Member State where the seller is registered with IOSS on a monthly basis; • keep records of all sales through IOSS for 10 years 	<ul style="list-style-type: none"> • submit a monthly electronic VAT return through the IOSS portal of the member country of identification for IOSS; • pay the VAT declared in the VAT return to the country of identification for IOSS on a monthly basis; • keep records of all sales through IOSS for 10 years

Source: compiled by the author from: [8].

Thus, from the point of view of trade between customers located within the EU, the new system of VAT administration for e-commerce transactions simplifies such procedures and reduces abuse by unscrupulous VAT payers. In contrast, the aforementioned modifications engender a set of challenges for non-EU sellers, including those from Ukraine, who want to import their goods to the EU. First of all, the new system may lead to an increase in the cost of goods due to the amount of the tax, which reduces demand for them and increases competition in the market. This may lead to customers of online marketplaces refusing to buy goods from Ukrainian sellers and switching to European goods. In addition, the process of registration with IOSS may cause difficulties, because it requires an intermediary in the case of a non-EU country.

An additional pivotal facet of VAT harmonization within the EU pertains to the alignment of VAT rates. As previously indicated, Directive 2006/112/EC specifies that the standard VAT rate must not fall below 15 %. Moreover, the directive permits

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the implementation of two reduced VAT rates, both exceeding 5 %, and in a special circumstance, allows for a single reduced rate below 5 %.

Table 4.11. VAT rates in EU member states* (in %)

Member States	Super-reduced Rate	Reduced rate	Standard rate	Parking Rate	Temporary rate
1	2	3	4	5	6
Belgium	–	6/12	21	12	
Bulgaria	–	9	20	–	–
Czech Republic	–	10/15	21	–	–
Denmark	–	–	25	–	–
Germany	–	7	19	–	–
Estonia	–	9	20	–	–
Ireland	4.8	9/13.5	23	13.5	21*
Greece	–	6/13	24	–	–
Spain	4	10	21	–	–
France	2.1	5.5/10	20	–	–
Croatia	–	5/13	25	–	–
Italy	4	5/10	22	–	–
Cyprus	–	5/9	19	–	–
Latvia	–	5/12	21	–	–
Lithuania	–	5/9	21	–	–
Luxembourg	3	8	17	14	
Hungary	–	5/18	27	–	–
Malta	–	5/7	18	–	–
Netherlands	–	9	21	–	–
Austria	–	10/13	20	13	5**
Poland	–	5/8	23	–	–
Portugal	–	6/13	23	13	
Romania	–	5/9	19	–	–
Slovenia	–	5/9.5	22	–	–
Slovakia	–	10	20	–	–
Finland	–	10/14	24	–	–
Sweden	–	6/12	25	-	-

Source: [398].

Notes: * Situation on 1st January 2020. The standard VAT rate is temporarily reduced from 23 % to 21 % from 09.09.2020 to 28.02.2021.

** Temporary reduced rate from 01.07.2020 to 31.12.2021.

The provided table outlines the application of various VAT rates across the EU, encompassing standard, reduced, super-reduced, parking, and temporary rates. Among

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the EU member states, the most elevated standard VAT rates are imposed by Hungary (27 %), and closely trailing are Denmark, Croatia, and Sweden (25 %). On the opposite spectrum, Luxembourg boasts the lowest standard rate of 17 %, with Malta following suit at 18 %. Cyprus, Germany, and Romania each implement a standard rate of 19 %. The EU's average standard VAT rate stands at 21 %, marking a six percentage point surplus in comparison to the minimum standard rate stipulated by EU legislation.

With few exceptions, a majority of EU member states possess the prerogative to implement reduced VAT rates, except for Denmark, which exclusively employs the standard rate. Moreover, 19 EU countries use two reduced VAT rates. Five countries are endowed with the authority to apply a super-reduced VAT rate of up to 5 %: Ireland (4.8 % on food), Spain (4 % on food, pharmaceuticals, books, newspapers and periodicals), France (2.1 % on food, pharmaceuticals, newspapers and periodicals), Italy (4 % on food, books, newspapers, periodicals, television fees and certain real estate goods), and Luxembourg (3 % on food, mineral water, clothing and footwear for children, books, newspapers, periodicals, television fees, certain real estate goods, etc.).

Some EU member states apply intermediate VAT rates: Belgium – 12 %, Ireland – 13.5 %, Luxembourg – 14 %, Austria and Portugal – 13 %. These countries, as of January 1, 1991, applied a reduced rate to the supply of goods or services other than those listed in Annex III of Directive 2006/112/EC. Now they are allowed to apply intermediate rates to the supply of these goods or services, provided that the rate is not lower than 12 %.

Furthermore, certain EU member states apply temporary VAT rates. In particular, the recent introduction of temporary VAT rates was related to the consequences of the global COVID-19 pandemic. For example, Germany reduced the standard VAT rate from 19 % to 16 % and the reduced VAT rate from 7 % to 5 % from July 1 to December 31, 2020. Ireland reduced its standard VAT rate from 23 per cent to 21 per cent from September 1, 2020, to February 28, 2021. Austria also decreased one of the reduced rates from 10 % to 5 % for the period from July 1, 2020 to August 31, 2021, and returned it to the previous level in 2022.

The above analysis shows that the EU member states apply a variety of VAT rates, which vary both by country and by type. S. Godard and A. Trüger note that the average standard VAT rate in the EU countries increased from 17.6 % in 1980 to 21.6 % in 2015. Its increase was recorded after 2008, when it became clear that additional budget revenues were needed after the crisis [109]. M. Keen emphasizes that in this situation, 13 EU countries had to raise the standard VAT rate to strengthen their public finances [155].

The world, which has not yet recovered from the economic consequences of the COVID-19 pandemic, is now forced to respond with strong economic sanctions to Russia's military aggression against Ukraine. These sanctions will have a significant

4.2. Current trends of VAT harmonization in the EU countries

impact on the economic, financial and food security of EU member states. Consequently, in the current situation in Europe, the choice between trade facilitation through harmonisation of VAT rates and strengthening the financial stability of individual countries and the EU as a whole will definitely be made in favor of financial benefits. We contend that further harmonisation of VAT rates is more of a strategic than a tactical task. Its implementation will necessarily involve a reduction in tax rates in certain countries, and, accordingly, a decrease in tax revenues. Therefore, we believe that, at this stage, EU member states will not sacrifice their tax sovereignty.

Based on our research, we come to the following salient conclusions:

1. The main areas of harmonisation of VAT administration policy in the EU are harmonisation of general approaches to VAT administration, harmonisation of approaches to VAT administration for business, and harmonisation of approaches to VAT collection from individuals.

2. Throughout the entire period of VAT harmonisation at the EU level, the main institution responsible for shaping approaches to its administration in the member states has been the European Commission, which includes the following: The VAT Committee, the VAT Expert Group, and the VAT Future Group. The VAT Future Group is the institution that initiates new approaches to the administration of this tax.

3. Currently, the main new initiatives in VAT administration encompass the establishment of a new definitive VAT system for intra-EU trade and new rules for the collection of VAT on cross-border business-to-consumer (B2C) e-commerce transactions (implemented commencing July 1, 2021).

4. The analysis of the essence of the new final VAT system for intra-EU trade has shown that the final decision on this issue has not been made since July 1, 2022. Our assessment indicates that the introduction of such a system will depend on the effectiveness of the VAT practice for cross-border business-to-consumer (B2C) e-commerce, which was introduced on July 1, 2021, and will also be determined by the impact of economic sanctions against the Russian Federation on the EU market.

5. The transformations unfolding within EU e-commerce taxation pose a number of challenges for Ukraine. Primarily, the new system may lead to an increase in the cost of goods by the amount of tax, which reduces demand for them and increases competition in the market. This may lead to customers of online marketplaces refusing to buy goods from Ukrainian sellers and switching to European ones. In addition, the registration process with IOSS, which requires an intermediary in the case of a non-EU country, may cause difficulties.

6. The prospects for harmonisation of VAT rates in the EU are more of a strategic than a tactical step. Consequently, at the current stage, EU member states will not sacrifice their tax sovereignty and the reduction in the fiscal efficiency of VAT as a result of harmonisation of its rates.

4.3. Harmonisation of excise taxation of energy products
in the EU and Ukraine

4.3. Harmonisation of excise taxation of energy products
in the EU and Ukraine

The fundamental parameters of energy and electricity taxation are set out in Directive 2003/96/EC of 27 October 2003 on the restructuring of the Community system for the taxation of energy and electricity [40] (Directive 2003/96/EC). A distinguishing hallmark of this directive lies in its comprehensive array of provisions, facilitating the implementation of varied national taxation approaches, exemptions, and reductions in taxation, contingent upon the specific domains and applications of diverse energy and electricity categories. In addition, Council Directive 95/60/EC [50] concerns the tax labelling of gas oil and kerosene to identify gas oil and kerosene subject to a reduced excise rate.

The basic aspects and provisions of Directive 2003/96/EC are partially considered in the Ukrainian legislation. However, a comparative analysis of the main elements of the excise tax on energy and electricity in the Tax Code of Ukraine and Directive 2003/96/EC allows us to formulate certain differences in the application of the harmonised excise tax on energy and electricity in the EU and Ukraine.

Let us delve into the intricacies of the typology of energy products that fall under taxation within the EU (Fig. 4.3).

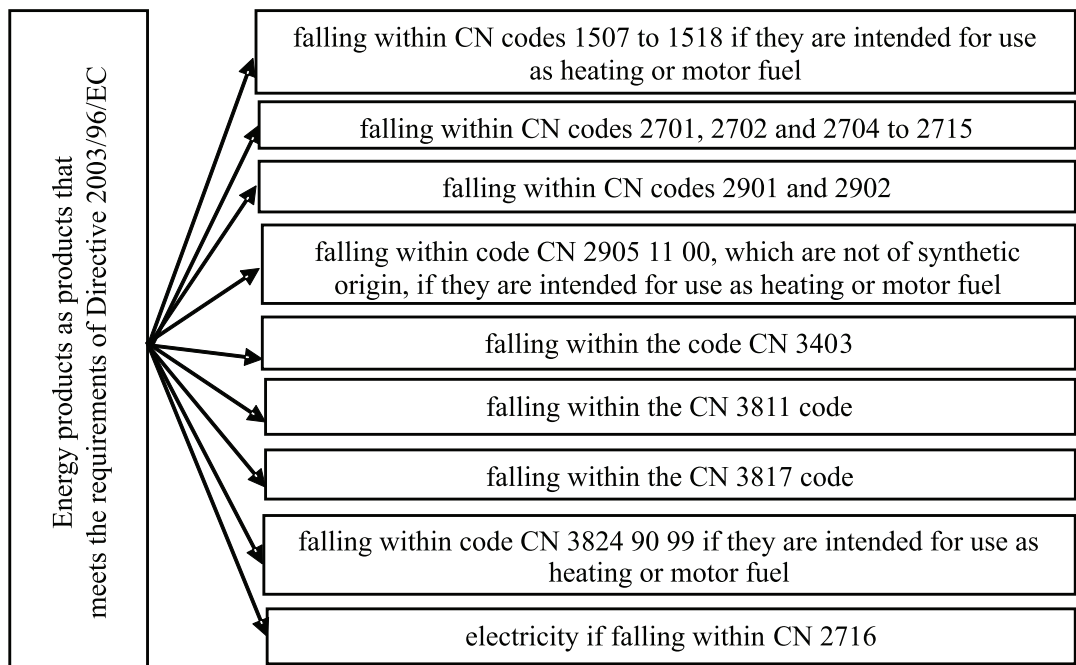


Fig. 4.3. Energy products regulated by Directive 2003/96/EC and subject to taxation in the EU [40]

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

The paramount facet in the process of harmonizing excise taxation for energy products is the alignment of approaches to interpreting the concept of “energy products” in line with European standards. Thus, Article 215 of the Tax Code of Ukraine (TCU) sets out the list of excisable goods and tax rates. Paragraph 1 of this Article stipulates that excisable goods that are energy products include fuel and electricity. The category of “fuel” for tax purposes is defined in sub-clause 14.1.141⁻¹ of the TCU: “petroleum products, liquefied gas, alternative motor fuel, mixed motor fuel, substances used as components of motor fuels, other goods specified in sub-clause 215.3.4 of clause 215.3 of Article 215 of the TCU”. Clause 215.1 of the TCU states that fuel includes: “goods (products) used as fuel for fuelling vehicles, equipment or devices with compression-ignition internal combustion engines, spark-ignition internal combustion engines, and crank-ignition internal combustion engines”. Sub-clause 215.3.4, to which reference is made in the definition of “fuel”, provides for a list of types of fuel and excise tax rates under the “Ukrainian Classification of Goods for Foreign Economic Activity” (UKTZED) codes that are subject to taxation.

A detailed analysis of the list of fuels subject to excise tax under the TCU and Article 2 of Directive 2003/96/EC (which contains a list of products that fall within the category of “energy products” for the purposes of the Directive) reveals a discrepancy between the list of energy products subject to specific excise taxes. In particular, the category “energy products” includes a wider range of goods than the category “fuel”. For example, it includes goods under the codes of the Combined Nomenclature: 1507-1518, 2701, 2702, 2704-2706, 2708-2709, 2712-2715, 2902, 3403, 3817, which are not included in the category of “fuel” under the TCU. Such energy products include:

- oils: soybean, peanut, palm, olive, sunflower, safflower, cottonseed, coconut, palm kernel, babassu, rapeseed, mustard;
- fats, oils and oils of animal or vegetable origin and their fractions;
- hard coal, lignite, coke and semi-coke from hard coal, lignite or peat;
- coal, water, generator, and similar gases, except for petroleum gases and other gaseous hydrocarbons;
- coal, lignite, peat and other mineral resins;
- pitch and pitch coke, obtained from coal tar or other mineral resins;
- crude oil and crude oil products derived from bituminous rocks;
- petroleum jelly (petrolatum), paraffin, microcrystalline petroleum wax, paraffin hook, ozokerite, lignite wax, peat wax;
- petroleum coke, petroleum bitumen and other residues from the refining of crude oil and petroleum products;
- bitumen and asphalt are natural;

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

- bituminous shales or oil shales and bituminous sandstones, asphalts and asphalt rocks;
- bitumen mixtures based on natural asphalt, natural bitumen, petroleum bitumen, mineral resins or mineral resin pitch;
- cyclic hydrocarbons: cyclanes (cycloalkanes), cyclenes (cycloalkenes) and cycloterpenes;
- lubricants (including lubricating and cooling emulsions for cutting tools, products for lubricating the threads of screws and nuts, rust removers or anticorrosive substances and preparations for lubricating moulds and facilitating the removal of products from moulds made on the basis of lubricants) and products used for fatty treatment of textile materials, leather, fur or other materials, except for products containing as main components 70 wt. % or more of petroleum oils or petroleum products derived from bituminous minerals;
- mixed alkyl benzene and mixed alkyl naphthalene, except for substances of heading 2707 or 2902 [342, pp. 260-261].

Directive 2003/96/EC has an exemption for certain energy products. It does not apply to:

- a) taxation of heat energy production and taxation of products falling under Combined Nomenclature codes 4401 and 4402;
- b) the following uses of energy products:
 - energy products used for purposes other than motor fuel or heating fuel;
 - dual use of energy resources¹ ;
 - electricity used for chemical reduction and in electrolytic and metallurgical processes;
 - electricity, when it accounts for more than 50% of the cost of production; mineralogical processes².

Meanwhile, the TCU lacks an enumeration of energy products exempt from excise tax and the specific domains where these energy products forfeit their taxable designation.

A pivotal element within the stipulations of Directive 2003/96/EC resides in the potentiality for implementing an array of distinct preferences. Articles 5-6 and 14–19 of the Directive are devoted to this issue. Specifically, Article 5 provides

¹ An energy product has a dual use when it is used as a heating fuel and for purposes other than as a motor fuel or heating fuel. The use of energy products for chemical reduction and in electrolytic and metallurgical processes is considered dual use.

² “Mineralogical processes” means processes classified in the NACE nomenclature under code DI 26 “production of other non-metallic mineral products” in Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community.

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for the possibility to apply differentiated excise tax rates under fiscal control in the following cases:

- when varying rates are intrinsically correlated with product quality;
- when differentiated tariffs depend on the quantitative levels of energy consumption used for heating;
- for the following purposes: local public passenger transport (including taxis), waste collection, armed forces and public administration, disabled people, ambulances;
- between commercial and non-commercial utilization, encompassing energy products and electricity as outlined in Articles 9 and 10.

In Ukraine, the realm of tax legislation scarcely incorporates such a practice, (with the exception of aviation petrol and jet fuel taxation). Contrariwise, a majority of motor fuels are subject to a uniform rate of taxation, amounting to EUR 213.5 per 1000 litres.

Article 6 of Directive 2003/96/EC stipulates the right of Member States to introduce exemptions or reductions in taxation: directly, at a differentiated rate, or by refunding all or part of the tax. In making a comparison on this aspect, it is worth highlighting that the TCU contains a range of exemptions from excise tax in a general sense, as well as specific exemptions pertaining to certain excisable goods. (clauses 213.2 and 213.3). Nonetheless, the list is notably lacking in the inclusion of energy products (except for the sale of liquefied gas at specialised auctions for the needs of the households in accordance with the procedure established by the Cabinet of Ministers of Ukraine).

Articles 14 to 19 of Council Directive 2003/96/EC define a range of additional potential preferences. These encompass exemptions from the taxation of energy products overall, those employed for specific designated purposes, and the allocation of a grace period to certain Member States for implementing exemptions or reduced rates. Nevertheless, it is relevant to highlight that such preferences are scarcely present within Ukraine's framework. The importation of energy products intended for use as raw materials in production, such as within the chemical industry, and their subsequent tax-free or zero-rated status, does not directly align with the concept of a tax benefit as outlined by the Directive. This is due to the exclusion of these energy products and electricity from excise tax applicability within Ukraine. Ukrainian legislation lacks provisions enabling the application of distinct tax rates by member states under fiscal supervision in the following cases: when differentiated rates are directly related to product quality; when differentiated rates depend on the level of quantitative consumption of electricity and energy products used for heating; for such purposes as: local public passenger transport (including taxis), waste collection, armed forces and public administration, disabled, ambulance; commercial and non-

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

commercial use of energy products and electricity, as referred to in Articles 9 and 10 of Directive 2003/96/EC.

This scenario reduces the robust regulatory capacity inherent in the excise tax framework, which extends to the domain of energy product taxation. This outcome consequently diminishes the competitive edge of local enterprises and undermines the overall vitality of the Ukrainian economy. Given that the price of energy products constitutes a pivotal factor in the cost structure of a multitude of goods and services, this shortfall reverberates across diverse sectors. It should be noted that Council Directive 2003/96/EC regulates the taxation of energy and electricity in terms of setting tax rates to be transposed into national legislation of the Member States, establishes taxation rules and exemptions from them, and authorises Member States to make such exemptions or introduce preferential treatment for certain energy products in national legislation. It also defines the groups of energy and electricity products for the purposes of the Directive in accordance with the Combined Nomenclature; minimum levels of taxation on motor fuels, heating fuels and electricity; types of preferences for exemption or reduction of taxation that may be granted by Member States; mandatory and optional exemptions from taxation of energy and electricity products and other types of benefits, as well as the conditions for their granting; special provisions on the transition period for Member States; the list of energy products subject to control measures; certain issues related to the determination of additional circumstances under which the tax on energy products arises and the definition of terms.

In particular, according to Council Directive 2003/96/EC, Member States must apply minimum excise tax rates to energy products for fuel, transport and electricity (Table 4.12).

Table 4.12. Minimum excise tax rates on energy and electricity products, in accordance with Council Directive 2003/96/EC

Minimum rates for motor fuel		
Type of fuel	Unit of measurement of the rate	Bid amount
1	2	3
Leaded petrol	Euros per 1000 litres	421
Unleaded petrol	Euros per 1000 litres	359
Gazoil	Euros per 1000 litres	330
Gus	Euros per 1000 litres	330
Liquefied natural gas	Euros per 1000 kilograms	125
Natural gas	Euros per gigajoule	2.6

**4.3. Harmonisation of excise taxation of energy products
in the EU and Ukraine**

Enf of table 4.12

1	2	3	
Minimum rates for motor fuel used for commercial and industrial use			
Type of fuel	Unit of measurement of the rate	Bid amount	
Gazoil	Euros per 1000 litres	21	
Gus	Euros per 1000 litres	21	
Liquefied natural gas	Euros per 1000 kilograms	41	
Natural gas	Euros per gigajoule	0.3	
Minimum heating tariffs			
Type of fuel	Unit of measurement of the rate	Bid amount	
		For business	For non-entrepreneurs
Gazoil	Euros per 1000 litres	21	21
Fuel oil	Euros per 1000 kilograms	15	15
Gus	Euros per 1000 litres	0	0
Liquefied natural gas	Euros per 1000 kilograms	0	0
Natural gas	Euros per giga joule	0.15	0.3
Coal and coke	Euros per giga joule	0.15	0.3

Source: compiled by: [295].

The table 4.12 illustrates the deviation in excise tax rates on motor fuels as delineated by Council Directive 2003/96/EC, contingent upon the fuel's application: industrial and commercial use versus consumption for the broader populace. Likewise, the excise tax rates applicable to energy products employed for heating purposes exhibit sensitivity to the distinction between business and household utilization. In contrast, the TCU lacks a comparable discernment in its provisions.

Table 4.13 shows the excise tax rates for certain types of motor fuels in force in the EU member states.

Table 4.13. Current excise tax rates on certain types of motor fuels in the EU Member States

Country	Excise tax rate on energy products		
	Unleaded petrol	Diesel fuel	Liquefied natural gas
1	2	3	4
Belgium	600.16	600.16	0
Bulgaria	363.02	330.3	173.84
Czech Republic	477	369.64	146.11
Denmark	638.4	434.55	542.19
Germany	654.5	470.4	317.53

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

End of table 4.13

1	2	3	4
Estonia	563	372	193
Ireland	619.36	515.38	217.62
Greece	700	410	430
Spain	503.92	379	57.47
France	682.9	594	207.1
Croatia	510.38	404.6	13.22
Italy	728.4	617.4	267.77
Cyprus	429	400	125
Latvia	509	414	285
Lithuania	466	372	304.1
Luxembourg	516.31	404.42	161.63
Hungary	344.95	317.4	266.19
Malta	549.38	413.1	38.94
Netherlands	813.14	521.68	355.23
Austria	482	397	261
Poland	373.68	330.15	187.44
Portugal	667.98	513.35	325.99
Romania	374.87	343.57	134.54
Slovenia	445.49	463.94	200.57
Slovakia	514	368	182
Finland	724	513	314.9
Sweden	642.8	452.06	345.63
EU-27	551.62	434.11	224.22

Source: compiled by: [87; 365].

The table above delineates that all EU member states, with the exception of Hungary, comply with the minimum excise tax rates on unleaded petrol and diesel fuel. Belgium, Spain, Croatia, and Malta deviate from the minimum excise tax on liquefied gas. These deviations align with the stipulations of Directive 2003/96/EC, albeit their prevalence remains limited.

An additional distinction between the Council Directive 2003/96/EC and the TCU lies in the disparate units of measurement employed for determining excise tax rates applicable to specific energy products (Table 4.14).

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Table 4.14. Current excise tax rates on certain energy products under the Tax Code

Type of fuel	Unit of measurement of the rate	Bid amount
Motor gasoline	Euros per 1000 litres	213.5
Diesel fuel	Euros per 1000 litres	213.5
Gazoil	Euros per 1000 litres	139.5
Gus	Euros per 1000 litres	183
Liquefied gas (propane, butane)	Euros per 1000 litres	52
Liquefied natural gas	Euros per 1000 litres	3.67
Fuel oil	Euros per 1000 litres	139.5

Source: compiled by: [363].

Specifically, sub-paragraph 215.3.4 of the TCU sets the excise tax rate in euros per 1000 litres (in litres reduced to t 15°C) across all types of energy products. In contrast, Council Directive 2003/96/EC sets the excise tax rate on liquefied natural gas at EUR 1.000 per kilogram, natural gas at EUR 1.000 per gigajoule, fuel oil at EUR 1.000 per kilogram, and coal and coke at EUR 1.000 per gigajoule. This distinction introduces challenges when attempting to compare the rates of the above energy products in Ukraine. An important difference between the Ukrainian structure of energy products subject to excise tax and the requirements of Council Directive 2003/96/EC is that in Ukraine, only liquefied natural gas under the Combined Nomenclature code 2711 11 00 is considered excisable goods in terms of natural gas. Instead, natural gas in a gaseous state under code 2711 21 00 is not subject to excise tax in Ukraine, contrary to the examined Directive.

A comparison of the rates of other energy products with the minimum levels stipulated in Council Directive 2003/96/EC shows that the excise tax rate on motor gasoline in Ukraine is 207,5 EUR per 1000 litres (97 %) lower than the minimum rate for leaded gasoline and 145,5 EUR per 1000 litres (68 %) lower than the minimum rate for unleaded gasoline. For diesel fuel, the excise tax rate in Ukraine is 116,5 EUR per 1,000 litres lower than the minimum level (55 %), and for kerosene – 147 EUR per 1.000 litres (80 %). This analysis reveals a significant disparity between the excise tax rates on the principal energy products in Ukraine and the stipulated minimum levels outlined by Directive 2003/96/EC.

When examining the current status and development of harmonizing excise taxes on energy products in accordance with EU norms, it becomes obvious that the existing provisions of Directive 2003/96/EC may be considered relatively outdated. This notion is underscored by the recurrent endeavors to amend its stipulations. Notably, in 2011, the EC announced a proposal to revise the aforementioned Directive [79]. The objective of the proposal was to modernise the energy taxation regulations

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

within the EU. This effort sought to revamp the taxation agenda for energy products, addressing prevailing disparities and anomalies while aligning with the overarching environmental and energy objectives of the EU. An essential component of the proposal entails incorporating both CO₂ emissions and energy content as factors in energy taxation. The proposition advocated for the segmentation of energy taxes into these two constituent components, thus influencing the comprehensive taxation rate applicable to fuel. The European Parliament lent its endorsement to the proposal on 19 April 2012. Unfortunately, due to negotiations amongst EU member states within the Council, the proposal was subsequently retracted by the EC in 2015.

Nonetheless, the European institutions have not given up their intention to change the energy taxation policy. This is happening against the backdrop of significant developments in energy markets and technologies and changes in the EU's international commitments, including the signing of the Paris Agreement in 2016. Thus, in 2019, the European Commission re-launched the process of revising Council Directive 2003/96/EC.

Initiating the legislative process, in September 2019, the EC published an evaluation report on the Directive under review [34]. Its conclusion is clear: Council Directive 2003/96/EC no longer meets the EU's internal market and climate objectives. In addition, the Commission concluded that:

- the Directive does not promote emission reductions, energy efficiency or alternative low carbon/sustainable fuels. The wide range of sectoral exemptions and reductions applied by Member States de facto stimulates the use of fossil fuels;
- the Directive does not provide sufficient incentives for investment in clean technologies;
- the Directive is not consistent with other EU climate policies (EU Emissions Trading System, Renewable Energy Directive, Energy Efficiency Directive).

Consequently, following a comprehensive preliminary evaluation, in July 2021, the EC put forward a new proposal to revise Council Directive 2003/96/EC as an integral part of the FitFor55 package [290]. This proposal stands geared towards fostering heightened consistency with other EU policies while significantly contributing to the attainment of the EU's medium- and long-term energy and climate ambitions, which are underpinned by the Green Deal. This resolute initiative endeavours to achieve its objectives by more accurately representing the climate consequences of diverse energy sources and fostering a shift in consumer and corporate behaviours.

In accordance with the aforementioned, the proposal encompasses three primary objectives:

- aligning the taxation of energy products and electricity with EU energy and climate policy to help achieve the EU's 2030 goals and climate neutrality by 2050;

4.3. Harmonisation of excise taxation of energy products in the EU and Ukraine

- preserving the EU internal market by updating the scope and structure of rates and rationalising the use of optional tax exemptions and discounts;
- preserving the ability of member states to raise revenue.

The examination of the examined proposal and its subsequent public discourse indicates a prevailing consensus among businesses and governmental entities regarding the suitability of an energy tax structure based on fuel energy content. Furthermore, a substantial majority of respondents are in favour of revising Council Directive 2003/96/EC to introduce incentives for alternative energy sources, which supports the transition to climate neutrality by reducing the incentive to favour fossil fuels through tax cuts, exemptions and rebates. Notably, a significant consensus among citizens and representatives from civil society also underscores support for the elimination of preferential tax treatment for specific sectors, along with the elimination of distinctions between commercial and non-commercial energy use.

Presently, this proposition is undergoing deliberations within a dedicated working group of the EC, comprised of member states. However, it is our contention that the strategic trajectory for reforming the excise taxation of energy products should already contain the benchmarks of energy intensity and the incorporation of renewable energy sources.

CONCLUSIONS

The subsection 2.2 examines the current trends in digital transformation at the state and international levels and highlights the use of blockchain technology in various economic models. The impact of the COVID-19 pandemic on the process of digitalization of enterprises was analyzed, and it was proved that the pace of digitalization has increased several times, changing the structure of the labor market. The main threats to the implementation of digitization tools were characterized, which are associated with significant costs for technology, the risk of unsuccessful implementation of professional management policy, insufficient government support, the level of competition, etc. Trends in changes in costs, revenues, and the number of users of digital transformation services and tools were studied by conducting a correlation analysis and creating a regression model. The main advantages of digital transformation were considered, including improving the quality of products and focusing on creating an ecological product; adaptation to variability; acceleration of market penetration; improvement of operational efficiency, etc. The scientific novelty consists in the study of the impact of blockchain technologies, artificial intelligence, and the Internet of Things on the world market by analyzing empirical data to form global trends, opportunities, and threats arising from the implementation of such technologies by companies and consumers, which also provokes the study of social consequences, among which: the impact of technology on employment, privacy, and security, exploring practical ways to mitigate the adverse effects of digitization while maximizing its benefits for the global community. The practical value of the research lies in promoting the modernization of the digital activities of Ukrainian enterprises, taking into account world trends and forecasts in martial law conditions, and overcoming the consequences of the COVID-19 pandemic and the European integration process.

Despite the challenges of the 21st century, including the war in Ukraine, a competitive environment is constantly being created to support the provision of an innovative teaching, research and business environment and to strengthen interaction with stakeholders. In the context of a full-scale war, integration into the European educational and scientific space is of paramount importance, and the tangible moral and financial support received from many national scientific communities and international scientific organisations has contributed to the creation of a national portal for international scientific and technical cooperation and an international consortium for infrastructure and research.

This study examined the range of problems and challenges faced by stakeholders in Ukrainian education, science and innovation due to the effects of the pandemic and

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full-scale war, and assessed the experience and solutions of government authorities, educational, scientific and business organisations in responding to these challenges. The participation of European and international partners was also taken into account in accordance with the priority and long-term needs that require partner assistance and enhanced cooperation between Ukrainian and foreign stakeholders for an effective response. As a result, it was proposed the main elements of strategic planning for the financial development of the innovation economy in the context of interaction between education, science and business stakeholders, which involves the process of defining goals and priorities, specific values of indicators, and their achievement in a certain perspective with the simultaneous formation of appropriate mechanisms and tools for implementation.

Overcoming the challenges facing territorial communities during times of war and in the post-war period, and ensuring the effectiveness of decentralization reforms, requires the implementation of strategies to restore the financial capacity of territories for self-development. The main approaches to defining the concept of “decentralization”, “fiscal decentralization” were studied and their advantages and risks were identified. Interconnection between deregulation and decentralization of the economy in the spatial development of territorial communities was identified. The main principles of fiscal decentralization based on the integration of the principles of public administration and the principles of fiscal federalism are highlighted. In this research, the following key directions for renewing Ukraine and its regions have been proposed, identifying the main issues and avenues for self-development of territorial communities based on fiscal decentralization: comprehensive regulation of legislative provisions across all areas of development and the functioning of the country’s territories, development of measures to stimulate the operation of united territorial communities in the post-war period; development and approval of criteria for fiscal decentralization effectiveness; facilitating advisory support to united territorial communities; establishing regional project support centers for the development of united territorial communities; creating conditions for the formation of “success stories” through the implementation of development projects for united territorial communities; ensuring the financial capacity of territorial communities through the development of state financial support for the development of territories affected during the war; taking into account the specific characteristics and uniqueness of territorial communities when designing development strategies and investment programs.

The analysis of the best European practices of restraining energy prices in the context of anti-inflationary measures shows the widespread use of tax preferences in the field of indirect taxation (VAT and excise tax) in the form of tax exemption and reduced or zero rates using. This direction turned out to be quite effective, but

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its implementation in Ukraine requires a qualitative improvement in the legislative regulation of targeted tax benefits and the creation of special safety mechanisms that ensure the rational use tax expenditures.

It seems promising, especially at the stage of post-war economic recovery of Ukraine, is the use of a tax benefits system aimed at ensuring energy efficiency and energy saving with a rational combination of tools of direct (corporate and Individual Income taxes), Indirect (VAT, excise tax, customs duty, energy and environmental taxes), as well as property taxation (property, land and transport taxes). Special attention should be paid to the use of the latest and widely used tax incentives for the spread of alternative energy sources, which is especially important for ensuring a “green transition”.

One of the unconventional ways to solve the problem of providing additional financial resources for investment development at the stage of economic recovery is to use the successful European experience of 2022-2023 on the introduction of windfall profit tax, but when justifying the appropriate and viable design of these taxes, it is necessary to take into account both the features of the national economy and the specifics of the design of the main taxes in Ukraine.

Subsection 4.2 the legislative features of regulating VAT harmonization with the help of EU Council Directives are emphasized. The directions of coordination of the VAT administration policy at the Community level are systematized. Retrospectives of forming approaches to establishing the principle of VAT collection, according to which trade in the EU countries should take place, are analyzed. The indicators of gaps in VAT revenues in the EU countries are analyzed. The essence of the finalized system of VAT administration in the EU, based on the principle of the destination country, is revealed and the prospects of its implementation are assessed. The peculiarities of the new rules of VAT collection on cross-border e-commerce transactions between business and consumers (B2C) are considered. The current trends in setting VAT rates in the EU countries are highlighted and the prospects for their further harmonization are outlined. According to the results of the study, it was established that the final decision on the issue of introducing a finalized VAT system for trade between enterprises within the EU depends on the effectiveness of the practice of VAT operation in relation to cross-border e-commerce between business and consumer (B2C), which was introduced on 1 July 2021 and is determined by the impact of economic sanctions on the EU market concerning the Russian Federation. Changes in the taxation of e-commerce in the EU may lead the rejection of online marketplace customers from the goods of Ukrainian sellers, and the reorientation to European goods.

Subsection 4.3 the main provisions of Council Directive 2003/96/EC on excise taxation of energy products are analyzed. It has been established that the norms of

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the Tax Code of Ukraine do not comply with the provisions of this directive in terms of: the list and structure of energy products, which are the subject to excise tax; the amount of tax rates; provision of tax preferences. Probable directions for reforming the EU legislation on excise taxation of energy products are outlined. Monitoring of legislative activities on taxation of energy products in Ukraine was carried out. As a result of the research, the conclusion is substantiated that at the current stage, the tax policy in the field of excise taxation of energy products, focused on the socio-economic realities of Ukraine, will be more justified than on the priorities of harmonization to EU standards. However, in order for Ukraine's European integration progress not to slow down due to the lack of reforms in terms of harmonization of the studied area, it is necessary to hold a number of consultations with EU institutions regarding the postponement of key issues of taxation of energy products.

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APPENDIX

Table A.1. Identified corruption risks in the activities of the State Financial Monitoring Service of Ukraine, factors of corruption risks and possible consequences of the corruption offense or an offense related to corruption in the field of “Coordination of the Financial Monitoring System”

Identified corruption risk	Probability	Consequences	Description of the identified corruption risk	Corruption risk factors	Possible consequences of the corruption offense or an offense related to corruption	Measures to eliminate corruption risk
<p>1</p> <p>3. The risk of actions or inaction by employees of the State Financial Monitoring Service for the benefit of entities of primary financial monitoring or third parties during supervision in the field of prevention and countermeasures against legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction by the activities of the relevant entities of primary financial monitoring (in particular, during scheduled and unscheduled inspections, including on-site inspections)</p>	Low	High	<p>4</p> <p>Absence of the clear procedure for conducting briefings with employees of the State Financial Monitoring Service before carrying out scheduled and unscheduled inspections, including on-site inspections, during supervision in the field of prevention and countermeasures against legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction by the activities of the relevant entities of primary financial monitoring may lead to the commission of the corruption or corruption-related offense</p>	<p>5</p> <p>Irregularity of the briefing procedure with employees of the State Financial Monitoring Service before scheduled and unscheduled inspections, including on-site inspections</p>	<p>6</p> <p>Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service</p>	<p>7</p> <p>Development and approval of the internal procedure for conducting briefings with employees of the State Financial Monitoring Service during supervision in the field of prevention and countermeasures against legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction according to the activities of the relevant entities of primary financial monitoring</p>

Appendix

Continue of Appendix A
Continue of table A.1

1	2	4. The risk of actions or inaction by employees of the State Financial Monitoring Service for the benefit of the entities of primary financial monitoring or third parties during the application of sanctions for violation of legal requirements as a result of inspections	Low	3	4	5	6	7
		The existence of uncertainty in the actions of the members of the State Financial Monitoring Commission regarding the settlement of the conflict of interests during the application of sanctions for violation of the requirements of the law as a result of inspections may lead to the commission of the corruption or corruption-related offense			Irregularity of the conflict of interest settlement procedure			Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service
								Amendments and additions to the State Financial Monitoring Order No. 99 dated 23.07.2015 "On approval of the procedure for accompanying the meetings of the State Financial Monitoring Commission on the application of sanctions for violation of the requirements of the Law of Ukraine "On prevention and countermeasures against legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing proliferation of weapons or legal acts regulating activities in the field of prevention and counteraction of legalization (laundering) of proceeds obtained through crime, financing of terrorism and financing of the proliferation of weapons of mass destruction" regarding the implementation of mechanisms for establishing and resolving conflicts of interest during application of sanctions for violation of legal requirements as a result of inspections

End of Appendix A
End of table A.1

1	2	3	4	5	6	7
5. The risk of actions or inaction by employees of the State Financial Monitoring Service for the benefit of the entities of primary financial monitoring or third parties when suspicions of a possible administrative offense are detected	Low	Low	The absence of clear internal control procedure for the detection of possible facts of administrative offenses may lead to the commission of the corruption or corruption-related offense	Irregularity of the procedure, which creates unreasonable discretionary powers	Bringing officials to justice, loss of reputation of the State Financial Monitoring Service, legal proceedings against the State Financial Monitoring Service	Analysis of departmental orders regarding the detection of suspicions of possible administrative offenses and preparation of changes to them, regarding the strengthening of control over the detection and registration of the specified facts

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