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# CONTENTS

## *ECONOMICS AND BUSINESS MANAGEMENT*



## *NATIONAL ECONOMY'S MARKET MECHANISMS OF ACCOUNTING, ANALYSIS AND AUDIT*



## *THEORETICAL AND APPLIED ASPECTS OF ECONOMIC PROCESSES IN UKRAINE AND IN THE WORLD ECONOMY*

*ISSN Print 2414-0287*
*ISSN Online 2707-8426*

## *FINANCE AND MONEY TURNOVER*



## *LABOUR ECONOMICS, PERSONNEL MANAGEMENT AND MARKETING*



## *ECONOMIC AND MATHEMATICAL MODELING AND INFORMATION TECHNOLOGIES IN ECONOMICS*

*ISSN Print 2414-0287*
*ISSN Online 2707-8426*

# ЗМІСТ

## *ЕКОНОМІКА ТА УПРАВЛІННЯ ПІДПРИЄМСТВАМИ*



## *РИНКОВІ МЕХАНІЗМИ ОБЛІКУ, АНАЛІЗУ ТА АУДИТУ В НАЦІОНАЛЬНІЙ ЕКОНОМІЦІ*



## *ТЕОРЕТИКО-ПРИКЛАДНІ АСПЕКТИ ЕКОНОМІЧНИХ ПРОЦЕСІВ В УКРАЇНІ ТА СВІТІ*

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## *ФІНАНСИ І ГРОШОВИЙ ОБІГ*



## *ЕКОНОМІКА ПРАЦІ, УПРАВЛІННЯ ПЕРСОНАЛОМ ТА МАРКЕТИНГ*



## *ЕКОНОМІКО-МАТЕМАТИЧНЕ МОДЕЛЮВАННЯ ТА ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ В ЕКОНОМІЦІ*

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# ECONOMICS AND BUSINESS MANAGEMENT

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## GREEN ECONOMY: PRINCIPLES, STRUCTURE AND IMPLEMENTATION TOOLS

**Cherep O.G., Mertachian K.O.**
*Zaporizhzhya National University*
*Ukraine,69000, Zaporozhie, Zhukovsky str., 66*

**Key words:**
ecology, nature, green economy, resources, economy, human, state, environment, efficiency, development, principles

It has been established that mankind has long been familiar with natural disasters, which, according to scientists, may have arisen due to, among other things, human impact on the environment. It is proved that since the industrial revolution in the world, mankind has rarely thought about the damage caused to nature and the consequences in the future. It has been established that there has been a noticeable recent trend towards environmental protection. Trends reflecting the dynamics of changing attitudes towards nature have been investigated: people all over the world are coming together to try to rectify an unfavourable environmental situation and prevent the environment from deteriorating even further. We note that large companies are switching to non-hazardous products to reduce their carbon footprint, production methods are changing, and additional equipment is being installed to clean up systems. The essence of the concept "green economy" is investigated and author's definition is given. The article reveals the content and essence of the concept of "green" economy. The reasons for transition to green technologies are considered. On an example of experience of overseas states (France, Denmark, South Korea, Poland, Japan, etc.) The analysis of world experience of transition to "green" economy is carried out. At the same time the preconditions for the transition to green economy in Ukraine (to start "green" construction, the development of "green" transport, the introduction of eco-labelling, the development of organic agriculture, etc.) are considered. It is proved that in all developed countries there is the sorting of waste, measures are taken to clean forests and water bodies. The system of green economy principles proposed by international organisations and initiatives is summarised. It is noted that in Ukraine, in contrast to European countries, measures aimed at protecting the environment, restoration of natural balance and programs for the transition to green economy have appeared relatively recently. Let us summarise the structure of the global Green Economy Index.

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## ЗЕЛЕНА ЕКОНОМІКА: ПРИНЦИПИ, СТРУКТУРА ТА ІНСТРУМЕНТ РЕАЛІЗАЦІЇ

**Череп О.Г., Мєртарчян К.О.**
*Запорізький національний університет*
*Україна, 69000, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
екологія, природа, зелена економіка, ресурси, економіка, людина, держава, навколишнє середовище, ефективність, розвиток, принципи

Встановлено, що здавна людству знайомі природні катаклізми, які, за словами вчених, могли виникнути, в тому числі через вплив людини на навколишнє середовище. Доведено, що з часів промислової революції у світі людство рідко замислювалося про те, якої шкоди завдає природі і які наслідки це може мати у майбутньому. Визначено, що останнім часом спостерігається помітна тенденція захисту довкілля. Досліджено тенденції, які відображають динаміку зміни підходів до природи: люди по всьому світу об'єднуються для того, щоб спробувати виправити несприятливу екологічну обстановку і не допустити ще більшого погіршення екології. Зазначимо, що величезні підприємства переходять на безпечніші продукти, щоб знизити викиди газів в атмосферу, змінюються способи виробництва, встановлюється додаткове обладнання для очищення систем. Досліджено та надано авторське визначення сутності поняття «зелена економіка». У статті розкрито зміст та сутність концепції «зелена» економіка. Розглянуто причини переходу до зелених технологій. На прикладі досвіду розвинених країн (Франція, Данія, Південна

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Корея, Польща, Японія та інших.) проведено аналіз світового досвіду початку «зеленої» економіці. Поряд із цим розглянуто передумови переходу до «зеленої» економіки в Україні (започаткувати «зелене» будівництво, розвиток «зеленого» транспорту, впровадити екомаркування, розвивати органічне сільське господарство тощо). Доведено, що у всіх розвинених країнах існує сортування сміття, проводяться заходи щодо очищення лісів та водоймищ. Узагальнено систему принципів зеленої економіки, що запропоновано міжнародними організаціями та ініціативами. Відмічено, що в Україні, на відміну від країн Європи, заходи, спрямовані на захист навколишнього середовища, відновлення природного балансу та програми з переходу на «зелену економіку» з'явилися відносно недавно. Узагальнемо структуру глобального індексу «зеленої економіки».

**The purpose of the study**

Study foreign experience in the practice of development and implementation of green economy elements in the developed countries of the world.

**Problem statement**

At the current stage of development of the world economy one of the effective directions is the «green economy», which emerges as a tool to combat environmental and resource development problems of the countries of the world in response to the financial and economic crisis in 2008. The UN Environmental Program (UNEP) in the same year announced the transition to the so-called «green economy», which should contribute to the recovery of the world economy, increase employment, fight against poverty, while accelerating the fight against climate change and degradation of the natural environment.

Today, the process of developing scientific, theoretical and methodological principles of green economy is taking place in the world. So, the concept of «green economy» is now one of the most pressing issues in the developed world. The problem is solved at the level of creation of documents, implementation of relevant projects, holding summits, forums, implementation of publications of world famous scientists.

**Relevance**

The development of a green economy is still very slow and uneven, despite the public demand for rapid growth, and individual areas of green growth, even if supported by public policy measures, are poorly connected and not developed in a systematic way.

**Analysis of recent research and publications**

Analysis of the scientific literature shows that the term «green economy» was first used by a group of scientists D. Pearce [1], A. Markandia [2], E. Barbier [3] in the report of the UK Government «The concept of green economy» (1989). Officially, the policy of «green economy» was adopted by the OECD in 2009 as a strategic direction of development («Green Growth Strategy of the OECD»). According to the UNEP definition, a green economy is an economy focused on improving human well-being and social equity by substantially reducing risks from environmental change and environmental resource scarcity.

**Results**

The green economy is a form of new economy, a transition to which many countries have proclaimed in one form or another. The United Nations (UN) describes a green economy as one that promotes the well-being of the population and reduces risks to the environment. The common characteristics of a green economy are the efficient and rational use of natural resources, the reduction of greenhouse gas emissions and the introduction of new, green technologies.

The concept of a green economy is now being actively discussed at the level of international organisations, national governments and among academics. Thus, approaches to the interpretation of the green economy and the definition of its basic characteristics have been the subject of research in many UN documents, in particular the Environmental Programme (UNEP) and the UN Department of Economic and Social Affairs (UNDESA).

We propose to consider the concept of «green economy» as an economy based on the rational use of natural resources through the introduction of alternative energy sources in order to reduce energy, technology and material intensity. The analysis of advantages in application of green economy for the state and economic entities is given in table 1.

Table 1 – Analysis of the benefits to government and businesses of applying a green economy

| For the state | For business entities |
|---|---|
| – reducing the economy's dependence on external supplies of raw materials and price fluctuations;<br>– introduction of energy- and resource-saving technologies;<br>– access to new markets through clean technologies;<br>- Attracting foreign direct investment;<br>– improving the environmental situation and conservation of natural resources;<br>– building a positive «green» image | – Reducing the unit cost of resource consumption;<br>– modernisation of production;<br>– generating additional income based on the use of available resources (through waste recycling);<br>– improved quality and competitiveness of products;<br>– Opportunity to benefit from government incentives;<br>– diversification of asset structure and reduction of strategic risks associated with traditional production. |

Source: Developed by the authors based on [4]

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Green growth means stimulating economic growth and development, while ensuring the conservation of natural assets and their uninterrupted provision of the resources and ecosystem services on which the well-being of all depends [4]. To this end, it must catalyse investment and innovation that will underpin sustainable growth and generate new economic opportunities.

Motives for companies to adopt an active environmental policy [5]:

1. Changing or limiting natural systems, reducing the availability and increasing the cost of critical raw materials, forcing companies to focus on resource efficiency and recovery of raw materials from waste.

2. Stakeholder demands and expectations related to the implementation of sustainability-related actions.

The transition to a pro-active environmental policy is one in which the enterprise begins to see environmental imperatives as an opportunity and an additional opportunity for business development through product change, technology change, staff competence improvement, etc. The enterprise's management process as a whole is organised so that market, commercial, social and environmental objectives can be reconciled. It is on such a proactive basis that today's business leaders build environmental management.

An active environmental policy of the enterprise (the «start of the pipe» solution) involves:

– pollution avoidance or prevention (considers pollution at source; zero-waste production);

– permanent improvement rather than temporary effects;

– has many positive effects (no need for waste sorting and recycling);

– regulatory compliance;

– saves money, time, space and other resources.

The ten key sectors of the green economy include agriculture, housing, energy, fisheries, forestry, industry, tourism, transport, waste management and recycling, and water management. Each of these sectors has its own objectives and certain goals, for example [6]:

1. Improving the energy efficiency of housing – 'greening' by retrofitting housing, creating zero-emission buildings; zero-energy and energy-efficient buildings. This can reduce energy consumption by almost 80% compared to conventional building design, creating millions of jobs.

2. Sustainable transport – greening involves switching to low-carbon fuels; investing in energy-efficient modes of transport; and planning green urban infrastructure for transport. This can achieve a 50% reduction in fuel consumption by the global car fleet by 2050, avoiding $CO_2$ emissions of 2 gt annually and creating 3.8 million new jobs worldwide.

3. Sustainable energy – shifting to new alternative energy technologies would create more than 20 million additional jobs: 2.1 million in wind power, 6.3 million in solar photovoltaics, and 12 million in agriculture and biofuel industries.

4. Sustainable agriculture – investing in sustainable agriculture, including organic land use. By 2050, UNEP predicts that one hectare of land should feed 6.1 to 6.4 people, compared to 4.5 people in 2005.

5. Environmental infrastructure – includes investments in healthy ecosystems: watersheds, river systems, wetlands, soils, forests, oceans and coral reefs that provide important economic services. Such investments would create large numbers of additional jobs (between 10 and 40 percent of investments) and significantly reduce the use of natural resources.

6. Waste management and recycling – provides for the safe and clean shipment, removal, storage and disposal of waste, while respecting three rules: waste reduction, recycling and reuse. The sector is expected to grow rapidly in the face of rising commodity prices.

Overall, UNEP estimates that the annual financing needs to meet the goals and green the global economy range from $1.05 trillion to $2.59 trillion. This represents less than 1/10th of the world's annual investment (global gross fixed capital formation, which was 22% of global GDP in 2009) [7].

The global scale of production and employment in the green economy. The scale of the green sector of the global economy is still relatively small, which is why the term «green economy» is often used in specialist literature alongside the term «green sprouts» of the economy. Indeed, the value of products and services produced in this sector is estimated at about 2 trillion dollars, or 2.7% of world GDP, profits – 530 billion dollars, employment – within 10 million people [8]. But the contribution of the «green» sector in the development of the economic complex of individual states, concentrating most of the capacities and investments in this area, is markedly higher: in the USA the «green» economy provides products and services for more than 600 billion dollars (4.2% of GDP). (4.2% of GDP), employment in it is estimated at 3 million people; in Japan – 3.4% of GDP and approximately 1.5 million people; in the EU as a whole – 2.5% of total GDP and over 3.4 million people. However, 199 is higher in individual countries: in Germany – about 4.8% plus global leadership in the export of environmental goods and services (in particular, more than 12% of global trade in climate protection equipment); in the UK, the world leader in the share of the «green» sector in GDP – $240bn (11.8% of GDP). (11 8.8% of GDP), the share in exports was 5%, in total employment – 3% [9].

In Germany, GDP growth was 1.6% in 2014. At the same time, total energy expenditure fell by 4.7%. Among these, electricity costs fell by 3.7% and CO2 emissions from energy production by 5%. For the European Union, from 1990 to 2014, GDP grew by 46% and the reduction in CO2 emissions by 23%. This is due to increased efficiency, especially in industry, as well as the rapid growth and expansion of renewable energy sources [9].

The Green Economy Index is an index that assesses and compares individual countries on the state of development of the green economy. Essentially, the index is the integral sum of two components – performance measurement and expert judgement (Figure 1).

The Global Green Economy Index (GGEI) [10], which measures the environmental performance of 80 countries and provides expert assessments of the greening of the economy.

An important and effective tool of green economy is a system of principles (tab. 2).

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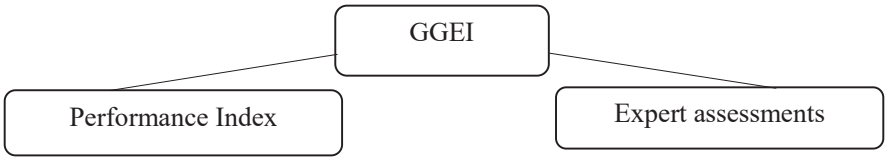


Fig. 1 – Structure of the Global Green Economy Index

Source: Developed by the authors based on [10]

Table 2 – System of green economy principles proposed by various international organisations and initiatives

| Name of organisation | The principles of a green economy |
|---|---|
| UNEP | 1. Ensures sustainable development.<br>2. Ensuring equality – the principle of equity.<br>3. Creates prosperity and well-being for all – The Principle of Dignity.<br>4. Improves the natural world – The integrity of the earth, planetary boundaries and the Precautionary Principle.<br>5. Inclusive and participatory decision-making – Inclusion Principle.<br>6. Accountability – Stewardship Principle.<br>7. Builds economic, social and environmental sustainability – Principle of sustainability.<br>8. Ensures sustainable consumption and production – Principle of efficiency.<br>9. Investing in the future – Intergenerational principle. |
| Stakeholder Forum, Bioregional Initiatives and Earth Charter Initiatives | 1. Equitable distribution of wealth.<br>2. economic justice governed by the principle of universal but differentiated responsibilities.<br>3. Equity for all generations.<br>4. Preventive approach.<br>5. Right to development.<br>6. Internalisation of externalities.<br>7. International co-operation.<br>8. International responsibility.<br>9. Information, participation, reporting.<br>10. Sustainable consumption and production.<br>11. Strategic, coordinated and integrated planning for sustainable development, green economy and poverty reduction.<br>12. Transition.<br>13. Rethinking well-being.<br>14. Gender equality.<br>15. Protecting biodiversity and preventing pollution of any component of the natural environment. |
| The High-Level Panel on Global Sustainability – UN Secretary General | 1. Potential driver of sustainable development, stimulating economic growth, necessary to eradicate poverty. Can provide an integrated approach to sustainable development when adapted to different countries, localities and areas according to their needs and situations and complemented by social protection to ensure inclusiveness and sustainability.<br>2. Adopts a long-term view, providing a sustainable model of growth that can withstand external shocks.<br>3. Measures progress beyond GDP alone.<br>4. Promotes employment, strengthens green business and provides green jobs.<br>5. Highlights technology and innovation, cooperation and institutions.<br>6. Sends clear signals by including social and environmental costs in the pricing mechanism. Ensures that finance is used to lay the foundations for higher sustainable development with sufficient financial returns.<br>7. Facilitates the transition from low-carbon and renewable towards energy efficiency.<br>8. Addresses resource scarcity and improves the condition of environment and natural assets, including ecosystems and biodiversity, by improving and enhancing the natural commons and resource management.<br>9. Can facilitate stakeholder involvement, participation and cooperation. |

Source: Developed by the authors based on [11]

The principles are useful for building a vision, creating a framework and awakening the interest of all stakeholders, but concrete mechanisms and tools are needed to move from theory to practice and implement the principles in question [8].

## Conclusions

A green economy is an integral part of sustainable development and implies a balanced coexistence of the environment, social and economic systems.

Regarding the implementation of a green economy, it is advisable for Ukraine:

1) to use the experience of developed European countries, which have already achieved significant success in the application of the principles of ecological economy;

2) combine environmental and economic components at all levels: local, regional and national;

3) switch to energy-saving technologies;

4) stimulate implementation of innovations;

5) implement new technologies of waste management and recycling;

6) expand use of alternative energy sources;

7) implement eco-labelling, develop organic farming;

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8) start «green» construction, development of «green» transport: trolley buses, trams, bicycles, electric cars, «green» electricity tariffs.

The prospect of further research is to study the international experience of greening the economy and the possibilities of its practical application in Ukraine.

A green economy creates new jobs, generates higher GDP growth, reduces risks such as the effects of climate change and increasing water scarcity, and stimulates economic progress.

The implementation of the green economy model involves creating conditions for business development based on new environmental standards and technologies, state support for socially and environmentally responsible businesses, increasing the role of the state and intergovernmental bodies in economic and environmental regulation, creating conditions for developing environmental culture of the population and popularizing educational environmental initiatives and resource-saving programs

Thus, the Green Economy is based on alternative energy and fuel sources, cleaner production technology, clean technologies in agriculture, green construction, as well as programmes for cleaning air, water and soil from pollution, recycling and disposal of waste, etc.

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# THE USE OF NEURAL NETWORK MODELING TO PREDICT THE VOLUME OF ENTERPRISE SALES

**Ivanov S.M., Maksyshko N.K.**
*Zaporizhia National University*
*Ukraine, 69600, Zaporizhia, Zhukovsky str., 66*
flydaiver@gmail.com, maxishko@ukr.net
ORCID: 0000-0003-1086-0701, 0000-0002-0473-7195

**Key words:**
enterprise, sales volumes, neural network modeling, forecasting

The article is devoted to research the problem of application of neural network modeling to improve the quality of forecasting sales of the enterprise. The use of the artificial neural network model – one of the means of artificial intelligence – to predict the sales of the enterprise due, on the one hand, unsatisfactory results of traditional quantitative forecasting methods, and, on the other hand, the implementation of the Concept of Artificial Intelligence in Ukraine. In order to analyze the results of the use of neural network modeling to forecast sales of the enterprise, it is developed the method of analysis based on comparative analysis of the quality of forecast models of four classes (groups): I – regression, II – autoregressive, III – nonlinear trend (considered in different periods ) and IV – neural network. Neural network models were considered in three types: 1) neural network input-output (net), 2) neural network based on the NAR model (nonlinear autoregression), 3) neural networks of NARX type – nonlinear autoregression with external (exogenous) input. Approbation of the methodology was carried out on the data of the company "Sportmaster" – a company that trades throughout Ukraine. The criterion for assessing the quality of the model is the average absolute percentage error (MAPE). Approbation of the method of analysis of the results of the use of neural network modeling to forecast sales of the enterprise revealed that the best models for forecasting and analysis were neural networks NAR and NARX (group IV), and slightly worse, by evaluation, was autoregressive model (group II), built on a long period 276 values. Thus, it was found that the use of neural network models allow to obtain a more accurate forecast of sales for the trading company, which confirms the feasibility of their use. It is proposed to improve the model of sales policy of the enterprise through the use of neural network modeling to forecast sales, which creates conditions for improving the efficiency and competitiveness of the enterprise. The results of the study can be used as a basis for improving the existing information systems of enterprise management.

# ЗАСТОСУВАННЯ НЕЙРОМЕРЕЖЕВОГО МОДЕЛЮВАННЯ ДЛЯ ПРОГНОЗУВАННЯ ОБСЯГІВ РЕАЛІЗАЦІЇ ПІДПРИЄМСТВА

**Іванов С.М., Максишко Н.К.**
*Запорізький національний університет*
*69600, Україна, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
підприємство, обсяги реалізації, нейромережеве моделювання, прогнозування

Стаття присвячена дослідженню проблеми застосування нейромережевого моделювання для підвищення якості прогнозування обсягів реалізації продукції підприємства. Застосування моделі штучної нейронної мережі – одного із засобів штучного інтелекту – для прогнозування обсягів реалізації підприємства зумовлені, з одного боку, незадовільними результатами застосування традиційних кількісних методів прогнозування, а, з іншого боку, завданнями реалізації в сфері економіки Концепції розвитку штучного інтелекту в Україні. З метою аналізу результатів застосування нейромережевого моделювання для прогнозування обсягів реалізації продукції підприємства запропоновано методику аналізу, яка базується на порівняльному аналізі якості прогнозних моделей чотирьох класів (груп): I – регресійні, II – авторегресійні, III – нелінійні трендові (які розглядалися на різних періодах ретроспекції) та IV – нейромережеві. Нейромережеві моделі розглядалися трьох видів:

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1) нейромережа введення–виведення (net), 2) нейромережа на основі моделі NAR (нелінійна авторегресія), 3) нейромережа виду NARX – нелінійна авторегресія з зовнішнім(екзогенним) входом. Апробація методики проведена на даних підприємства ТОВ «Sportmaster» – підприємства, яке займається торгівлею по всій Україні. Критерієм оцінки якості моделі обрано середню абсолютну відсоткову похибку (MAPE). Апробація методики аналізу результатів застосування нейромережевого моделювання для прогнозування обсягів реалізації продукції підприємства виявила, що кращими моделями для прогнозування та аналізу виявилися нейромережі NAR та NARX (група IV), та з дещо гіршою оцінкою авторегресійна модель (група II), побудована за довгим періодом ретроспекції (276 значень). Таким чином, виявлено, що використання нейромережевих моделей дає змогу отримати більш точний прогноз обсягів реалізації для торговельного підприємства, що підтверджує доцільність їх використання. Запропоновано удосконалення моделі формування збутової політики підприємства за рахунок використання нейромережевого моделювання для прогнозування обсягів продажів, яка створює умови для підвищення ефективності та конкурентоспроможності підприємства. Результати дослідження можуть бути покладеними в основу удосконалення існуючих на сьогодні інформаційних систем управління підприємствами.

## Statement of the problem

Forecasting is an integral part of every modern business. In market conditions, the results of forecasting are necessary to determine the direction of further development of the enterprise, understanding the state of the environment in which it operates, planning effective use of resources, prevention of possible negative factors and more. One of the central indicators in planning at the enterprise is the projected volume of sales of products (works, services). This indicator serves as a basis for planning the leading business processes in the enterprise and affects the efficiency and competitiveness of the enterprise.

Particular important is the problem of ensuring the highest possible quality of forecasts. The solution to this problem is to justify and choose a relevant forecasting method.

Today there is a well-developed arsenal of qualitative and quantitative forecasting methods. Quantitative methods are based, as a rule, on traditional approaches and models (statistical, extrapolation, network and others). However, the existence of such a wide variety of methods suggests that the results of their application are not always acceptable, and in the field of economics lead to unacceptable losses.

According to the Concept of Development of Artificial Intelligence in Ukraine adopted in [1], one of the priority areas of its implementation is the introduction of artificial intelligence technologies in the economy. In particular, one of the tasks of the Concept is to motivate business entities to introduce artificial intelligence technologies to increase their own efficiency. In the light of these tasks, the urgent problem is the use of one of the means of artificial intelligence – the model of artificial neural network to predict the volume of sales of the enterprise.

## Analysis of latest research and publications

In [2] the issue of estimating the logistical risks of enterprises on the basis of sales forecasting is investigated. This paper proposes the concept of logistical risk of forecasting demand and developed a method for estimating the logistical risk of forecasting demand by two estimates: the accuracy of the trend model for forecasting and the accuracy of the forecast taking into account seasonality.

The work [3] is devoted to the quantitative assessment of the activities of agricultural enterprises in the Volyn region in terms of sales of products (goods, works, services).

In papers [4–6] the modern directions of improvement of the system of financial planning and forecasting of the enterprises of Ukraine were investigated. Along with the analysis of the criteria for assessing the financial condition and results of the enterprise, the methods of forecasting and planning the turnover of the enterprise are considered. Article [6], in particular, is devoted to a comparative analysis of existing methods of forecasting economic indicators for a commercial enterprise. However, real results of the assessment of the quality of forecasts by the above methods were not provided.

In [7] (Sakun A. Zh., Pantiuk I.P.) theoretical and methodological aspects of the system approach are considered, which provides consideration of the enterprise as a complex of subsystems (production, sales, warehousing, transport and other activities). The results of this work are important for determining the place of the indicator of sales of the enterprise to ensure the effective functioning of the enterprise.

Along with the already widespread methods [8], new methods are actively involved in the arsenal of forecasting.

Thus, in [9] the author explored the possibilities of creating and applying artificial intelligence systems, methods of neural network theories and fuzzy logic in economics, and in [10] – studied the use of neural networks in the analysis of macroeconomic indicators.

Effective methods of working with Big Data and their application for forecasting are investigated in [11; 12]. However, insufficient attention has been paid to the problem of using neural networks to forecast the company's sales.

## Goals formulation

The purpose of the article is to analyze the results of the use of neural network modeling to improve the quality of forecasting sales of the enterprise.

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**Presentation of the main research material**

The continuity of the production process, the turnover of working capital, the results of financial and economic activities, the profitability of the enterprise depend on how the sales system is organized.

According to the current legislation, the company sells its products and other tangible assets on the basis of direct agreements (contracts) established by the state, through commodity exchanges, through the network of its trading companies. The growth rate of sales, improving its quality directly affect the cost, profit and profitability of the industry.

Thus, based on forecasting sales, the company has the opportunity to regulate and balance its activities. The number of products produced and sold (productivity, organization of services) are the main indicators that represent the activities of the organization, and the forecast of these indicators is important for assessing their activities both at the planning stage and at the implementation stage.

The rapid development of the use of information technology in business management has led to the need to find new forecasting methods, the use of which gives a competitive advantage in the industry.

The use of neural networks allows you to take into account the factors on the basis of which you can build short-term forecasts. Using a neural network architecture (perceptron with one hidden layer) and a database (retail turnover and other data from the external and internal environment), it is possible to obtain an effective forecasting system [6].

To substantiate the use of neural networks in forecasting the volume of sales of the enterprise, we will conduct a comparative analysis of the results of the application of different forecasting methods to the relevant time series (Fig. 1).

Lets conduct research on the application of the proposed methodology on the information base of the company «Sportmaster» – a company that trades throughout Ukraine in sporting goods through the online platform [13] and off-line outlets.

The dynamics of sales volumes of Sportmaster LLC for the period from January 1, 2021 to October 25, 2021 is presented in Fig. 2

To use the technique presented in Fig. 1, we construct four groups of predictive models (I–IV).

*I group of models* – regression models.

We select the following variables as input data for model construction:

$Y_t$ – sales volume (revenue per day) on day *t*,

$X^1_{(t-1)}$ – sales volume per day ($t-1$), (value of revenue for the day last year),

$X^2_{(t-1)}$ – number of visitors per day $t-1$ (value of the number of visitors per day),

$X^3_{(t-1)}$ – number of visitors per day ($t-1$) in the previous year (value of the number of visitors per day in the previous year),

$X^4_{(t-1)}$ – conversion (the ratio of revenue to the number of visitors per day ($t-1$)).

Construct a regression model in the form (1).

$$Y_t = \beta_0 + \beta_1 X^1_{(t-1)} + \beta_2 X^2_{(t-1)} + \beta_3 X^3_{(t-1)} + \beta_4 X^4_{(t-1)}, \quad (1)$$

where $\beta_0, \ldots, \beta_4$ – regression coefficients.

After excluding insignificant variables, the regression model has the form (2):

$$Y_t = 106274,6727 + 0,56837602 * X^1_{t-1} + \\ + 20,3680408 * X^2_{t-1}, \quad (2)$$

where $X^1_{t-1}$ – the value of the indicator «Sales volume for the past period»; $X^2_{t-1}$ – value of the indicator «Number of visitors for the previous period».

According to Fisher's criterion, the model turned out to be significant $F_p$=33,26545978 and $F_к$=1,217523008.

To compare the results of forecasting using regression models, we build a regression model based on the last 30 values. When building a regression model for the last 30 values, the variables $X^1_{t-1}$ «Sales volume (last year)», $X^2_{t-1}$ – «Visitors», $X_{4(t-1)}$ – «Conversion»were not significant. According to Fisher's criterion, this model was also significant ($F_p$ = 55,49025734 and $F_к$ = 1,868709158) and has the form (3):

$$Y_t = -59860,11726 + 382,4861479 * X^3_{t-1}, \quad (3)$$

where $X^3_{t-1}$ – the value of the data «Visitors (last year) for the past period».

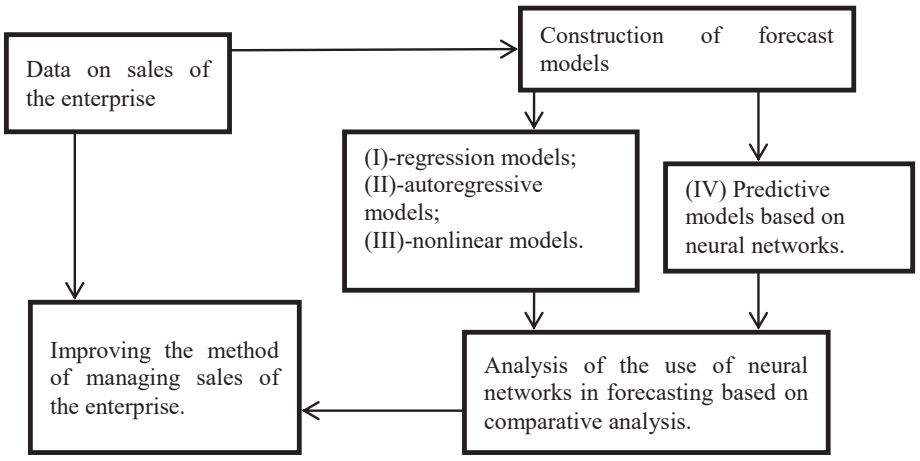


Fig. 1 – Schematic model of research of application of neural networks in forecasting of volumes of realization of the enterprise

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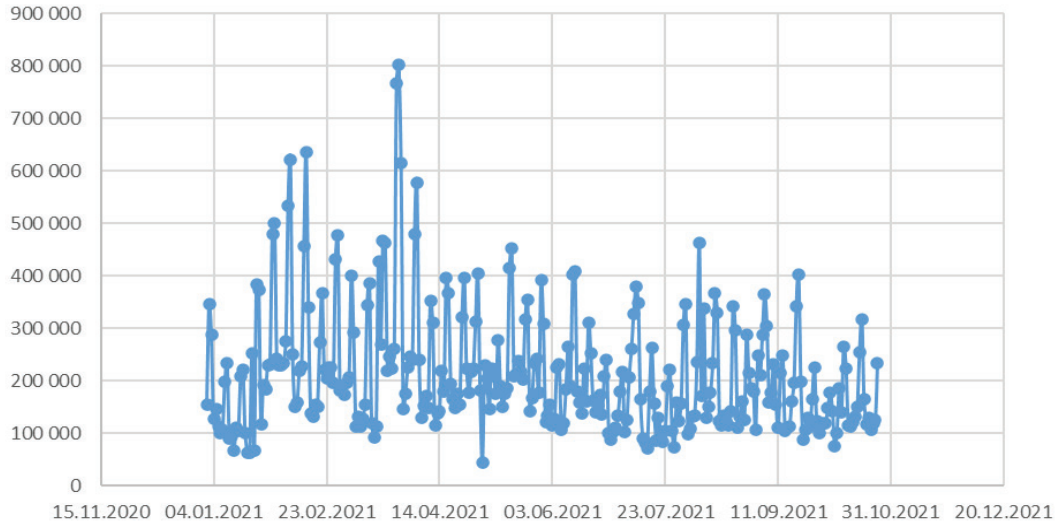


Fig. 2 – Dynamics of sales volumes (thousand UAH) of Sportmaster LLC in 2021

To check the quality of the models, we use the average absolute percentage error (MAPE):

$$MAPE = \frac{100}{\tau} \sum_{t=T+1}^{T+\tau} \left| \frac{x_t - \hat{x}_t}{x_t} \right|. \quad (4)$$

According to the MAPE values, the second regression model (3) was better than the first (2) (34.4% <39.7%).

*II group of models* – autoregressive models.

Let's build a linear autoregressive model in the form of (5) and check its quality to predict the volume of sales:

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \beta_3 Y_{t-3} + \\ + \beta_4 Y_{t-4} + \beta_5 Y_{t-5} + \beta_6 Y_{t-6} + \beta_7 Y_{t-7}, \quad (5)$$

where $Y_t$ – sales volume (value of revenue per day) per day $t$.

Note that the use of the previous 7 values in the construction of linear autoregression is justified by the presence in the dynamics of sales of the enterprise cyclical period $\tau = 7$.

As a result of the obtained autoregressive model in the form of (6):

$$Y = 59913,93726 + 0,424782064 * Y_{t-1} - \\ - 0,128803009 * Y_{t-2} + -0,108383078 * Y_{t-5} + \\ + 0,150485653 * Y_{t-6} + 0,378672112 * Y_{t-7}. \quad (6)$$

When constructing the model, the variables $Y_{t-3}$ and $Y_{t-4}$ turned out to be insignificant. After excluding them from the model, the model turned out to be significant with estimates $F_p$ = 45.39891697 and $F_к$ = 1.220899795 according to Fisher's criterion.

Let's build the second autoregressive model on 30 values and check the quality of the constructed forecast on the MAPE value.

The result is an autoregressive model in the form of (7):

$$Y_t = 125852,526 + 0,736685 * Y_{t-1} - \\ - 0,462959 * Y_{t-2} - 0,401845 * Y_{t-5} + \\ + 0,350310 * Y_{t-6}. \quad (7)$$

When constructing autoregression based on 30 values, three variables were not significant: $Y_{t-3}$, $Y_{t-4}$ and $Y_{t-7}$. In general, the model turned out to be significant according to Fisher's criterion $F_p$ = 6,375638401 and $F_к$ = 1,91918774.

The linear autoregression model, which was based on 276 observations, provides a better prediction. This can be seen in the value of MAPE, for the first model 22.8% and for the second 26.2%.

*Group III* of forecast models – nonlinear trend models.

Let's check the possibility of using nonlinear trend models to forecast sales. In the table 1 presents the results of modeling – built three trend models (in which $x = Y_{t-1}$) with estimates of their quality.

*Group IV* – neural network models

To predict the volume of sales of the enterprise by means of neural network modeling, we use Matlab software for the design and training of neural networks Neural Time Series (ntstool) [8].

This tool allows you to solve three types of nonlinear time series. We will build these models to forecast sales volumes.

Let's build a neural network of input-output (*net*). Two networks are involved in this network: the input series $x(t)$ and the output series $y(t)$. We predict the value of $y(t)$ from the previous values of $x(t)$, but without knowing the previous values of $y(t)$:

$$y(t) = f\left(x(t-1), \ldots, x(t-d)\right). \quad (8)$$

Table 1 – The results of building nonlinear trend models for forecasting sales with estimates of their quality

| Model | $R^2$ | Model error (MAPE) |
|---|---|---|
| $Y_t = 10392 \times \ln(x) + 259898$ | 0.0088 | 50% |
| $Y_t = 216229 \times x^{-0.029}$ | 0.0035 | 41,6% |
| $Y_t = -2.0871 \times x^2 + 329.18 \times x + 220755$ | 0.0542 | 23,5% |

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At the input of the model we use data on the following variables: sales last year ($X_1$, value of revenue per day last year), number of visitors ($X_2$, value of number of visitors per day), number of visitors last year ($X_3$, value of visitors per day last year), conversion ($X_4$, the ratio of revenue to the number of visitors per day). The total amount of data at the input will be equal to 283, 15 observations will be left to analyze the quality of the forecast model.

The source array will be the value of sales for the next period of time. In total, the number of observations will be 283, as well as the input data. Input and output data will be specified by columns.

Maltab uses three algorithms to study the neural network: Levenberg – Marquardt, Bayesian ordering, and scalable conjugate gradient. We will use the Levenberg-Marquardt algorithm because it has a number of advantages, including good work with large data sets and fast operation of the algorithm.

Let's build a neural network based on the *NAR* model (nonlinear autoregression). The calculation of the value of sales in the model is based on formula (9):

$$y(t) = f\left(y(t-1),\ldots,y(t-d)\right). \quad (9)$$

That is, in this neural network, the input of the learning network will be equal to the output. In our case, at the entrance we will give 283 values of the company's sales for 2021.

Construct a neural network of the form *NARX* – nonlinear autoregression with external (exogenous) input. This model combines the two previous models, ie has the ability to set the input parameters of the impact on sales volumes, as well as the forecast to use past values of sales:

$$y(t) = f\left(x(t-1),\ldots,x(t-d), y(t-1),\ldots,y(t-d)\right). \quad (10)$$

On the input models we will use the parameters of sales volume for the last year ($X_1$, the value of revenue for the last year), the number of visitors ($X_2$, the value of the number of visitors per day), the number of visitors last year ($X_3$, the value of the number of visitors per day last year), conversion ($X_4$, the ratio of revenue to visitors per day). At the output for network training we give the value of sales, the total number of observations 283.

Let's move on to the general simulation results. Let's analyze the quality of the developed models by comparing the values of MAPE error, which are presented in table 2.

Thus, the best models for prediction and analysis are NAR and NARX neural networks, as well as autoregression of 276 values.

That is, neural networks provide an opportunity to obtain a more accurate forecast of sales for the company, which justifies their use to improve the quality of sales activities.

The use of neural networks will allow you to more effectively plan the results of sales activities by increasing the accuracy of forecasts. The improved model of sales activity of the enterprise is presented in fig. 3.

## Conclusions

The results of the use of neural network modeling to improve the quality of forecasting sales of the enterprise are analyzed in the paper. For this purpose, a method of analysis is proposed, which is based on a comparative analysis of the quality of predictive models of four classes: I – regression, II – autoregressive, III – nonlinear trend and IV – neural network. Neural network models, in turn, were considered in three types: 1) neural network input-output (net), 2) neural network based on the NAR model (nonlinear autoregression), 3) neural networks of NARX type – nonlinear autoregression with external (exogenous) input.

The research was conducted on the basis of the information base of Sportmaster LLC, an enterprise engaged in trade throughout Ukraine.

The quality of the forecast for each of the models is assessed.

In the process of researching results of predictive models, it was found that the best models for prediction and analysis were neural networks NAR and NARX, as well as autoregressive model for 276 values.

That is, the use of neural network models allow to obtain a more accurate forecast of sales for the trading company, which justifies their use to improve the quality of management (including sales) activities.

An improved model of sales policy of the enterprise with the use of sales forecasting based on the use of neural network modeling, which creates conditions to improve the accuracy of marketing forecasts, increase the efficiency and competitiveness of the enterprise.

Prospects for further research are in the expanding the information base of the study. The results of this paper can be used as a basis for improving the existing ERP-systems – integrated information systems for enterprise management.

Table 2 – Comparison of models quality

| Model | The value of the MAPE | Ability to forecast for more than 1 period |
|---|---|---|
| Regression ($n$ = 282) | 39,7% | – |
| Regression ($n$ = 30) | 34,4% | – |
| Autoregression ($n$ = 276) | 22,8% | + |
| Autoregression ($n$ = 30) | 26,2% | + |
| Trend model (logarithmic) | 50% | + |
| Trend model (step) | 41,6% | + |
| Trend model (polynomial) | 23,5% | + |
| Neural network (net) | 23,3% | – |
| Neural network (NAR) | 16,6% | + |
| Neural network (NARX) | 17.4% | – |

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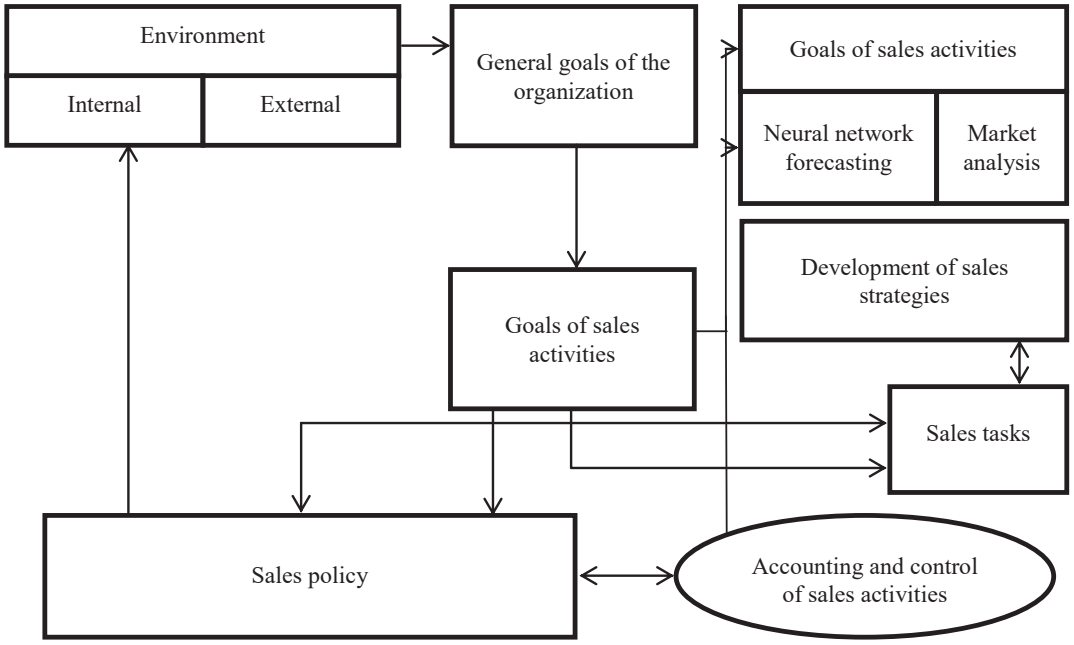


Fig. 3 – Improved model of formation of sales policy of the enterprise

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# THE ESSENCE AND CONTENT OF THE PROJECT APPROACH TO THE ECONOMIC SECURITY OF THE ORGANIZATION

**Kysilova I.Yu.**
*Zaporizhzhia National University*
*Ukraine, 69600, Zaporizhzhia, st. Zhukovsky, 66*
inna_kisileva@ukr.net

**Key words:**
project approach, economic security, determinants

The article is devoted to the definition of the main characteristics of the project approach to the economic security of the organization, which is a purposeful method of forming a future economic system. The key determinants of economic security of the organization are highlighted, taking into account the levels of its provision: macro-, meso- and micro-levels. The composition of key determinants in the system of economic security of the organization is also determined. The article proposes to consider improving the level of economic security of the organization as a project, that is, to consider this category from the standpoint of the project approach.. The advantage of the project approach is the independence of employees and departments in making managerial decisions, concentration at work, a clear division of responsibility, minimal control and administration. It is noted that the project approach provides for the possibility of solving any problem with a sufficient amount of time and money. The content of the project will be the economic security of the organization, the target component of the project is to achieve a certain level of economic security of the organization, the limitations of the project are time and resources. Based on this, the main features of the project are highlighted. The main stages of work on the project are: determining the deviation of the actual indicator from the target, identifying threats to the economic security of the organization; calculation of scenario options for the ratio of time and financial resources; solving the problem of optimizing the distribution of time and financial resources of the organization; drawing up a plan of events (Gantt graphics); allocation of threats to economic security in accordance with the main determinants. A comparative description of the project approach with traditional approaches to organization management is given. It is noted that for different types of projects, depending on the goals and restrictions, it is advisable to develop an individual risk management system and a set of measures. A comparison of the main components of the economic security of the organization and the procedures of the project approach is given.

# СУТНІСТЬ ТА ЗМІСТ ПРОЕКТНОГО ПІДХОДУ ДО ЕКОНОМІЧНОЇ БЕЗПЕКИ ОРГАНІЗАЦІЇ

**Кисільова І.Ю.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
проектний підхід, економічна безпека, детермінанти

Стаття присвячена визначенню основних характеристик проектного підхода до економічної безпеки організації, який являє собою цілеспрямований метод формування майбутньої економічної системи. Виділено ключові детермінанти економічної безпеки організації із врахуванням рівней її забезпечення: макро-, мезо- и мікрорівні. Також визначено склад ключових детерминантів в системі економічній безпеки організації. У статті запропоновано розглядати підвищення рівня економічної безпеки організації, як проект, тобто розглядати дану категорію з позицій проектного підхода. Перевагою проектного підхода визначено самостійність співробітників та підрозділів у прийнятті управлінських рішень, концентрацію на роботі, чіткий розподіл відповідальності, мінімальний контроль та адміністрування. Зазначено, що проектний підхід передбачає можливість рішення будь-якої проблеми при достатній кількості часу та коштів. Змістом проекта буде економічна безпека організації, цільова складова

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проекта – досягнення певного рівня економічної безпеки організації, обмеженнями проекта є час та ресурси. На основі цього виділено основні ознаки проекта. Основними етапами роботи над проектом визначено: визначення відхилення фактичного показника від цільового, виявлення загроз економічної безпеки організації; розрахунок сценарних варіантів співвідношення часових та фінансових ресурсів; рішення задачі оптимізації розподілу часових та фінансових ресурсів організації; складання плана заходів (графіка Ганта); виділення загроз економічної безпеки у відповідності із основними детермінантами. Наведено порівняльну характеристику проектного підхода із традиційними підходами управління організацією. Зазначено, що для різних типів проектів в залежності від цілей та обмежень доцільно розробити індивідуальну систему ризик-менеджмента та комплекс заходів. Наведено порівняння основних складових економічної безпеки організації та процедур проектного підхода.

## Problem statement

The project approach to the economic security of the organization is a purposeful method of forming the future economic system. The economic security of an organization is a complex characteristic that takes into account the totality of financial, social, production, investment, innovation, resource, industrial, environmental and other potentials [1]. In the process of forming a plan to ensure the economic security of the organization, it is necessary to identify its key determinants and determine the appropriate indicators, which will assess the need for resources, time and opportunities to increase the level of economic security.

## Analysis of recent researches and publications

The project approach to enterprise management is the subject of research by many domestic and foreign scientists. However, the application of the project approach to managing the economic security of the enterprise is almost not proved. Although some scientists, in particular Sultigova M.B., Rossoshanska O.V., Prodius O., Baranskaya A.N. consider this approach very promising, this issue, in particular, the conclusion of the essence of the project approach remains insufficiently worked out in the domestic literature.

## Formulating of objectives

The purpose of the article is to study the essence of the «project approach to the economic security of the organization» concept, its peculiarities definition.

## Presentation of the main research material

It is advisable to single out the key determinants of the economic security of the organization, taking into account the levels of its provision. To do this, we will distinguish macro-, meso- and micro-levels. The composition of the key determinants in the economic security system of the organization is given in tab. 1.

The advantages of this approach include the independence of employees and departments in making managerial decisions, concentration on work, a large distribution of responsibility, minimal control and administration [2].

At the same time, it is not without drawbacks, such as inefficient use of resources, due to tight end dates and «safe» assessments of tasks, including time reserves, the preservation of the risks of delaying the completion of tasks. So the hard finish dates of tasks, typical of any repetitive processes, require appropriate reserves of time, which leads to insufficiently efficient use of resources. At the same time, the risks of task delays remain [2]. These factors show the internal reserves of growth for the organization.

To date, in practical activities, there are trends in the transition from traditional theoretical approaches to the management of the organization (situational, structural and functional [3]) to relatively new (process and project) approaches. The need for the evolution of existing approaches is due to the shortcomings identified as a result of the analysis of the processes of financial and economic activities of organizations, based on the study of the tools

Table 1 – Key determinants of economic security of the organization

| Level of economic security | Key determinants |
|---|---|
| Micro level | Financial |
| Meso-level | Industry |
| | Production territorial |
| | Informational |
| Macro level | Political |
| | Socio-economic |
| | Resource (personnel, raw materials) |
| | Sales |
| | Social |
| | Investment technology |
| | Industrial-ecological |
| | Managerial institutional |

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of each approach and the methodology for studying the category «economic security of the organization» (tab. 2).

The process approach is a natural evolution of the functional approach. Each business process is a logical series of interdependent actions, using the resources of the organization, aimed at obtaining in the foreseeable future the final result necessary for the organization and satisfying the interests of customers. In this case, the process is considered as a mode of operation, reflecting the change in the states of the system. Taking into account the fact that functions and processes cannot exist in isolation from each other, modern enterprises have to combine functional and process approaches. To do this, it is necessary to simultaneously design the organizational structure (functional areas) and the order of interactions within this structure (processes) [4]. Analysis of the influence of the external environment on the efficiency of production using the process approach showed the impossibility of obtaining a long-term competitive advantage due to the possibility of applying similar procedures by competitors. Therefore, only business models (processes) and complementary assets that are difficult to replicate by competitors give a competitive advantage [1].

In the conditions of an innovative economy, the effectiveness of the process approach in comparison with others has strengthened its position in operational management, but as a tool for implementing strategy and strategic changes in the organization, business structures prefer project management. Economic security is an important element of the strategic management system of the organization. In our opinion, it is advisable to consider increasing the level of economic security of the organization as a project, that is, to interpret this category from the standpoint of the project approach [3]. The project approach assumes the possibility of solving any technical problem with a sufficient amount of time and money. One or more resources are often scarce in practice, necessitating the development of tools for this approach. The essence of project management is expressed by the implementation of the project with the maximum possible efficiency with time constraints, financial and material resources, as well as high requirements for the quality of the final results of the project.

The content of the project will be the economic security of the organization, the target component of the project is the achievement of a certain level of economic security of the organization, in the role of classical constraints – time and resources. Based on the above, let highlight the main features of the project «Economic security of the organization»:

1. The goal of the project is to achieve a certain level of economic security of the organization.

2. The need to comply with the financial and time constraints of the project under the influence of external and internal threats.

3. The uniqueness of each project is determined by its target component (overcoming the crisis, increasing individual indicators, achieving the optimal level).

4. Purposeful transfer of the system from the existing state to some desired state [4].

Nowadays the project approach is now actively developing on the basis of such sciences as management, marketing, personnel management and others, and is being introduced in organizations of various industries. Reasonable use of project management tools is aimed at creating an integrated methodology for implementing this approach in the activities of the organization. The project approach as a purposeful method of forming future systems is a kind of continuation of the process approach, but it has a number of significant differences. The basis for the construction of the project structure is not the concept of functions or processes, but the project as the main production, innovative and competing business unit [4].

The main difference between a business process and a project is its repetition or reproduction over time. The project involves the creation of a unique product, through the implementation of complex activities and the provision of continuous integrating and coordinating influence with strict restrictions on time, costs and quality of work [4]. Obviously, management needs to clearly understand the results of the business. The business case for the need to implement a project management system for an organization requires its initial comparative assessment with traditional methods. The results of the comparative assessment are presented in tab. 3.

The introduction of professional methods of project management into the organization's activities increases production efficiency, and allows achieving target results with minimal costs. According to some estimates [4], the effectiveness of the implementation of the project management system is confirmed by an increase in the value of the business by up to 20 % due to the improvement of the quality of planning and the most efficient use of resources. At the same time, the implementation of the project approach is associated with certain difficulties and problems of an organizational and technical nature. The first problem is the interpretation of the category of «project».

A misunderstanding of the essence of the project structure can lead to complete organizational and managerial chaos. To date, depending on the conditions of operation, industry affiliation, market conditions and other factors in different organizations, different initiatives are understood as a project. As an independent field of knowledge, project management has existed for quite a long time, but the interpretation of the category «project» under the influence of trends occurring in the development of the theory and practice of project management continues to be clarified.

Table 2 – Disadvantages of traditional approaches to the management of the organization

| Approach | The basis for building an organizational structure | Disadvantages |
|---|---|---|
| Situation | Adaptation to the environment | Inconsistency between departments |
| Structural | Hierarchical basis | Bureaucracy, inefficient methods, low motivation |
| Functional | Principle of functional areas | Lack of interest in the final product |

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Table 3 – Comparison of traditional methods and project management

| Parameter | Traditional approaches | Project approach |
|---|---|---|
| Management methods | Bureaucratic administrative-command | Modern market relations |
| Methods of work and expense planning | Obsolete, inefficient use of material and human resources | Detailed planning, optimization of all costs and resources, |
| Motivation for the final result | No | Reasoned |
| Timing of work | Delayed deadlines for work | In the shortest possible time |
| Approach to the organization and selection of specialists | Departmental | Competitive basis |
| Interest in high quality of work | No | Focus on high quality |
| The ratio of time costs and quality of work | Excessive involvement of employees, loss of quality | Minimum necessary time expenditure for high quality |
| Work costs | Do not correspond to their real volume | For the amount of work performed |

Despite the existing differences in the definition of the essence of the project, there are common features that allow us to identify it as an activity aimed at achieving a specific result in the foreseeable future with fixed deadlines and budget. It should be remembered that each project is inherently unique. Therefore, for different types of projects, depending on the goals and limitations, it is advisable to develop an individual risk management system with the appropriate depth and evaluation intervals, as well as a set of measures. Planning project activities, in contrast to the current one, is a more complex and responsible procedure, since the risks inherent in projects due to its uniqueness are much higher. There are industries for which the project structure is the only acceptable one. Initially, project management was the prerogative of engineering and construction organizations. The development of the theoretical basis of project management and the generalization of practical experience made it possible to apply this approach in each organization that needs specific systemic changes. The achievement of the set goals and effective results is ensured by the rational use of all resources in the process of developing its activities.

Thus, the management of the organization, when deciding on the transition to project management, should correlate its business idea with the main features of the project. The transition to the project «rails» for the sake of the transition itself will not allow you to get the expected benefits, but it will not save you from the complexities and costs of implementing and implementing this approach. «The second problem is the readiness to switch to the project system. The International Institute of Project Management has developed a special methodology for determining the readiness of an organization to implement project management [5]. The introduction of project management in an organization with a linear management structure is accompanied by a transformation into a matrix structure. In this case, each employee simultaneously reports to the heads of the structural unit and the project, which requires a clear prioritization of tasks, rational allocation of resources, detailed time planning and consistency of managers at various levels. «In practice, the following key stages of the transition to the project system are distinguished:

1. Creation of a unified procedure for project management, described in the relevant regulations.
2. Reorganization of the company.
3. Clear functional separation of employees and departments within the projects.
4. Coordination of projects.
5. Development and implementation of an information system as a tool for scheduling and control of project work.

Thus, in order to move to full-fledged project management, the organization must reach a certain level of maturity. The third obstacle on the way to the project system is the cost of setting up project management. The cost of implementing a project management system is determined by the size of the organization and the cost of the project management information subsystem responsible for project planning, budgeting, database of implemented projects, etc. There are the following main strategies for optimizing the cost of implementing project management:

1. Development of internal methods with the participation of competent employees involved in projects, and the involvement of specialists from a consulting firm. This method of transition to project management takes more time, but is cheaper.
2. The use of start-up consulting in key departments of the organization in order to move the setting of project management «from the dead point».

This method is relatively fast, but requires large financial investments. Obviously, the costs of implementing project management should not exceed the expected benefits from its use. The next organizational problem in the transition to project management is the issue of combining process and project activities. The introduction of project management involves reorganization and changes in the organizational structure.

The responsibility of a manager who applies a functional or process approach is to solve specific problems, form business processes and control personnel. With the implementation of the project approach, the control of process stages and their boundaries moves from functional managers to project managers. Thus, in order to ensure the sustainability and increase the efficiency of the organization's activities, it is necessary to define formal rules for the coexistence of process and project activities.

The next issue is the control of project costs. To solve it successfully, it will be necessary to review the applied planning methods and the level of control. It is advisable to plan the costs of the project in proportion to the cost of working time for the implementation of the project and coordinate with the management. Project costs should

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be controlled on the basis of their compliance with the planned level on the basis of the distribution of personnel time and salary costs according to the relevant drivers [4].

At the same time, the control of project costs must comply with the principles of expediency and economy, otherwise bureaucratic administrative and command methods of control can lead to irreversible consequences for the «project team», violating the corresponding necessary level of trust. As a result, for a full-scale transition to project management, any organization will need not only to invest certain funds, but also to overcome some problems in its implementation within a certain time.

Despite the above difficulties and problems in the transition to project management, every year you can observe an increasing number of new business projects. However, with all the advantages that this method of management can give if it is properly applied, its implementation alone does not guarantee success. Successful completion of any project is possible with a comprehensive accounting of two components of project management:

1. The technical side of project management includes planning and cost assessment, project management and control, risk and quality management, as well as the preparation of project documentation and evaluation of results.

2. The managerial competence of project management is determined by the unity of the project team, the level of communication, the motivation system and the focus on the result.

It is the ability to form a team charged with obtaining the necessary «product» as a result of the project, in conditions of limited material and time resources, to instill in it the psychology of success, is often a key factor in leveling some inevitably arising technical inaccuracies due to the uniqueness of the project. Thus, project management methods can be applied to the operational activities of the organization, including ensuring economic security. The application of the project approach to the category of «economic security of the organization» is aimed at achieving a certain level of economic security, that is, a specific transition from one (current) state to another (target, optimal) by eliminating the factor of inefficient spending of time on tasks and reducing the risks that arise when tasks are not completed on time. «One of the key aspects that ensure the continuous uninterrupted functioning of all internal processes is its economic security. The financial and economic activities of the organization are exposed to a significant number of hazards, challenges and threats caused by external and internal factors. The factors affecting the main components of the organization's activities are heterogeneous and require constant monitoring, analysis and control.

Accounting, monitoring and analysis of these factors is a very laborious process that requires significant time and certain financial costs, which necessitates the allocation of a full-fledged system responsible for ensuring the economic security of the organization.

At the same time, it is impossible to ensure full monitoring and accounting of these factors in the absence of an appropriate system for ensuring the economic security of the organization. The system itself needs appropriate theoretical, methodological and legal support. Theoretical aspects of economic security, such as threats, criteria, indicators and indicators in practice do not receive real application due to the lack of specific management decisions aimed at both «targeted» troubleshooting in the system (tactical measures) and promising strategic measures [4]. A project is understood as an enterprise that is largely characterized by the uniqueness of the conditions in their totality. From these positions, «Economic security-project» can be defined as an economic system exposed to the influence of disparate negative internal and external factors, requiring the adoption of certain management decisions to achieve a certain level of economic security [5].

Given the complexity and versatility of the concept, essence and structure of economic security, it is necessary to take into account a significant number of both economic and regulatory and legal features of the activities of a particular organization. In this regard, a project is a set of documents containing a fundamental or final decision that gives a complete picture of the object and subsequent data for the development of documentation. Thus, economic security as a project is defined as a set of management decisions of an organizational and economic nature that regulate the process of the organization's activities under the influence of various kinds of threats in the appropriate regulatory and legal form [4].

Thus, the economic security of the organization is a set of measures aimed at ensuring the economic interests of the organization, by increasing the indicators of threats in conditions of limited financial and time resources [4]. To date, the combination of two approaches – project and process – seems to be very effective. At the same time, the introduction and application of this methodology requires the development of an appropriate corporate standard for the unification of management procedures and uniform measures for the application of process or project approaches, depending on the activities carried out.

When introducing a project management system in an organization with a linear management structure, there is often a transition to matrix management, when each employee simultaneously reports to the managers of the structural unit and the project, which causes certain problems due to the lack of clear priorities in solving the tasks facing the staff [3]. Ensuring a harmonious combination of process and project activities in the organization involves the following stages:

1. Development of the structure of operational activities of the organization. At this stage, the project managers conduct a formal description of the organizational and functional structure of business processes, the allocation of all functions of the organization, the appointment of performers. Partial restructuring of business processes allows you to replace redundant and duplicate functions with missing ones.

2. Creation of mechanisms for the implementation of processes in the project form: (construction of alternative options for the implementation of processes; adaptation of the company's management system and transition to the implementation of projects; (formation of regulations for the interaction of process owners with project managers.

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3. Creation of mechanisms for unified project implementation.

The processes required for project execution are grouped and described in the form of procedures [51]. Each procedure is assigned a manager who controls its effective implementation and further development, which ensures equality between projects and processes. A key factor in the success of project management is the availability of a well-defined pre-defined plan, minimization of risks and deviations from the plan, effective change management. The result of the project can be not only products, but also the solution of certain internal tasks to improve the quality of products and the efficiency of labor organization, optimization of financial flows [4].

In view of the above, economic security can be considered as the content of the project. Today, project management is an integral part of the organization's management system.

The modern theory of project management has received a very high-quality scientific justification and wide practical application. Currently, the main project management procedures are formed in accordance with the traditional methodology and methodologies such as IPMA, PMI, PRINCE2. Next, we will adapt the main stages of work on the project to the PRINCE2 methodology. To do this, we will compare the main components of the economic security of the organization and the procedures of the project approach. The results obtained are presented in tab. 4 [4].

The final stage will be the formation of a plan reflecting the key determinants and indicators of the organization's economic security system, in order to determine the available resources, time and opportunities to improve the level of economic security of the organization.

## Conclusions

The proposed methodology makes it possible to adapt the process of ensuring economic security, taking into account all its components according to the traditional methodology (threat identification, assessment, counteraction, monitoring) to the project approach (achieving the goal in conditions of limited resources), which allows using all the advantages of the latter for organizing this activity. The indicator system allows you to monitor threats and apply countermeasures based on the applied organizational structure.

Table 4 – Correlation of the main components of the economic security of the organization and the procedures of the project approach

| No components of the EB system | Procedures consistent with the project approach | Contents of the project "Economic security of the organization" |
|---|---|---|
| 1 Determining the level of Economic Security | Start a project | Determining the deviation of the actual level of economic security of the organization from the target |
| 2 Threats of Economic Security | | Identification of Economic Security threats |
| 3 Criteria, indicators, indicators of Economic Security, threshold values of indicators | Project Planning | Calculation of scenario options for the ratio:<br>a) high budget, short-term period;<br>b) average budget, medium term;<br>c) low budget, long-term period. |
| 4 Measures to counter threats | Project management | Preparation of an action plan – Gantt schedule for three periods (short-term, medium-term, long-term) |
| 5 Countermeasure mechanism | Stage Control.<br>Stage boundary control.<br>Production management. | Solving the problem of optimization of financial and time resources on the basis of the critical chain method |
| 6 Monitoring | Project Completion. | Identify your organization's Economic Security threats according to key determinants |

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# POSSIBILITIES OF BUSINESS CONSOLIDATION AT MACHINE-BUILDING ENTERPRISES

**Lynenko A.V., Dobrohvost L.S.**
*Zaporizhzhia national university*
*Ukraine, 69000, Zaporizhzhia, Zhukovskij str., 66*
konf.econom.znu@gmail.com, ab060492mls@gmail.com

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economic efficiency, innovations, integration, capital, competitiveness, consolidation, mechanical engineering, strategic development

The article provides a systematic study of the concept of business consolidation in relation to the activities of machine-building enterprises in Ukraine. This combination of efforts is aimed at the subjects of economic relations both to strengthen existing competitive advantages and to gain new ones to increase the competitiveness of integrated business. This mutually beneficial interaction is beneficial to the enterprises of the machine-building industry in the conditions of aggravation of the crisis phenomena, new challenges of economy. The existing methods of solving problems of the industrial branch are generalized and the efficiency of the new methods and approaches of integration of machine-building enterprises in Ukraine by consolidation of business is substantiated. In particular, it is proposed to strengthen the consolidation of investment as a tool for developing the competitive strategy of domestic machine-building enterprises. The most acceptable opportunities for business consolidation by Ukrainian machine-building enterprises and priority areas of development of this industry have been identified. The possible risks of such a variant of mutual assistance between machine-building enterprises have also been thoroughly studied, given the current trends in economic development at the regional and international levels. In general, the consolidation of business with proper support provides the participating companies with the economic effects of synergies, which makes it possible to ensure sustainable business development on the basis of social responsibility.

# МОЖЛИВОСТІ КОНСОЛІДАЦІЇ БІЗНЕСУ МАШИНОБУДІВНИХ ПІДПРИЄМСТВ

**Линенко А.В., Доброхвост Л.С.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
економічна ефективність, інновації, інтеграція, капітал, конкурентоспроможність, консолідація, машинобудування, стратегічний розвиток

У статті здійснене системне дослідження поняття консолідації бізнесу щодо діяльності машинобудівних підприємств України. Таке об'єднання зусиль спрямовується суб'єктами економічних відносин як на посилення існуючих конкурентних переваг, так і на здобуття нових для підвищення конкурентоспроможності інтегрованого бізнесу. Ця взаємовигідна взаємодія вигідна підприємствам машинобудівної галузі в умовах загострення кризових явищ, нових викликів економіки. Узагальнені існуючі методи вирішення проблем промислової галузі й обґрунтована ефективність нових методів та підходів інтеграції підприємств машинобудування в Україні шляхом консолідації бізнесу. Зокрема, запропоновано посилити консолідацію капіталів як інструменту розвитку конкурентної стратегії вітчизняних підприємств машинобудування. Визначені найбільш прийнятні можливості консолідації бізнесу українськими машинобудівними підприємствами та пріоритетні напрями розвитку цієї галузі. Також були ґрунтовно досліджені можливі ризики такого варіанту взаємодопомоги між машинобудівними підприємствами з огляду на сучасні тенденції розвитку економіки на регіональному і міжнародному рівнях. У цілому консолідація бізнесу за належного супроводу забезпечує підприємствам-учасникам економічні ефекти синергії, що дає можливість забезпечувати сталий розвиток бізнесу на засадах соціальної відповідальності.

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## Statement of the problem

The most important problem of any enterprise or organization that focuses on success and sustainable operation is their survival and ensuring continuous development. An effective solution to this problem is to create and implement competitive advantages that can be largely achieved through an effective enterprise development strategy, in particular in the field of mechanical engineering.

In recent years, structural changes have taken place in the machine-building industry of Ukraine and the conditions of enterprise activity have changed dramatically. Significant decline in production in the industry, indicate, on the one hand, the mismatch or low level of compliance of enterprises with the needs of society, and on the other hand, with the problems of effective use of their potential in accelerated transformations and changes in the environment. Russia's aggression has led to significant changes in exports and imports of engineering products stimulated the development of new approaches to management and innovation in production processes.

Mechanical engineering provides 2,4 % of the gross value added of Ukraine, the volume of sold industrial products is 6,2 % (2020), and the number of employees – 16,7 %. This indicates that labor productivity in mechanical engineering is more than 2,5 times lower than in the industry of Ukraine as a whole [6].

Another problem is that today large machine-building enterprises need to be modernized, which requires significant investment resources. Without proper modernization, there will be job and income cuts. Significant investment potential can be released through capital consolidation.

The engineering industry needs to be transformed, and in the context of the benefits of business consolidation, of course with antitrust restrictions, the merger of engineering companies can significantly enhance their potential.

## Analysis of recent studies and publications

Capital consolidation processes, including the activities of multinational companies, strategic alliances, mergers and acquisitions, have been studied by many scholars. For example, researchers at PricewaterhouseCoopers studied the possible conflict of interest between the participants in the consolidation and ways to reconcile them to achieve understanding and business development [1].

The results of Kravets K. research on new methodological approaches to assessing the effects of business consolidation are of practical value [3].

Scientists Petrovych Y. substantiated the directions of adaptation of machine-building enterprises to modern changes, in particular by consolidating them [5].

The strategic problems of business consolidation have been thoroughly studied by Yurii E. & Lutsyk I., who emphasized the need to take into account the factors of uncertainty in the activities of modern machine-building enterprises [7].

## Objectives of the article

The purpose of this article is to substantiate the possibilities of consolidating the business of machine-building enterprises of Ukraine taking into account potential risks, implementation of capital consolidation tools in the competitive strategy of machine-building enterprises.

## The main material of the research

Business consolidation is an important tool for transformation in the business sector of Ukraine. Business consolidation is the combination of two or more industrial enterprises, independent companies and functional business structures. As a result of such a full or partial merger, overall market potential tends to increase, costs are reduced and efficiency is achieved through scale, which contributes to the establishment of new sustainable relationships with other market participants. The source of growth for business consolidation is the integration of assets into a single system with stable and effective relationships.

Mechanical engineering is one of the high-tech industries. It has a key role in ensuring scientific and technological progress and innovative economic development. Its products, namely the means of production, various types of inventory and household durables, creating a technological component of modernization, determine both the scientific and technical level of industrial production and the efficiency of the economy as a whole.

In a market economy, the problem of forming a strategy for the development and modeling of economic processes of machine-building enterprises is relevant. Innovative renewal of the technical and technological base of machine-building enterprises and a variety of corporate governance models makes us think about how effective they can be in socio-economic realities, so the formation of strategy for machine-building enterprises is appropriate in today's instability.

Combining several business units into new companies is the most radical option for the engineering industry. A consolidated business can get cheaper financing if the newly created company is stable, profitable and has more assets that can be used as collateral. In addition, business consolidation will help concentrate the market economy, expand the product range, increase geographical coverage and increase the customer base.

In order for Ukraine to become a competitive state in the engineering industry, it is necessary to take into account global trends and actively implement best practices in their fields. The priority direction of development of the machine-building industry is its transformation into an organized, sustainable, profitable part of our country's economy. Organized at the level of the district, region, territory or any other principle, consolidation should become a «helper» in this process [2].

The destruction of production facilities and transport infrastructure, the severance of interregional industrial ties due to the military conflict in eastern Ukraine, the annexation of Crimea, and the further military expansion of the Russian Federation have led to declining production and declining industrial demand. Mechanical engineering proved to be more vulnerable to the influence of these factors than the industry as a whole. With the general decline in industrial production for the period 2019–2021, the production of mechanical engineering products decreased by 27,3 %. Also in recent years, the COVID-19 pandemic,

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which has created unforeseen conditions for production, is of great importance for reducing performance in the field of mechanical engineering.

Increasingly, the amalgamation of enterprises contributes to their successful development, thanks to this consolidation of enterprises increase their market value, increase the efficiency of their economic activities. However, it should also be noted that a high level of consolidation of production does not guarantee high economic efficiency of production processes, while excessive concentration can lead to loss of control of the company.

In addition, if the integrated enterprise has a large size, irrational structure of fixed assets, suboptimal range of products, the level of consolidation can not be an indicator of production efficiency. In each specific industry there are the most optimal sizes of enterprises, objectively determined by the mechanism of achieving economic effect of scale. Under such conditions, companies are looking for effective development strategies aimed not only at implementing their social functions, but also to increase the degree of their independence and economic independence [3].

In a broad sense, the strategy of capital consolidation is an economic strategy of the enterprise, aimed at achieving competitive advantage through the consolidation of capital in its various forms. In the narrow sense, the strategy of capital consolidation is interpreted based on a specific goal and the chosen form of consolidation. Such strategies include vertical and horizontal integration, diversification, mergers and acquisitions, concentration, and strategic alliances.

The main motives that motivate capital to consolidate are:

– maximizing the company's profit and strengthening competitive advantages in the market;
– technical and technological advantages;
– economies of scale;
– higher stability and stability of the enterprise in times of crisis;
– advantages in the field of circulation;
– cost reduction;
– increasing the competitiveness of the enterprise in market conditions [5].

Machine-building companies apply a strategy of capital consolidation not only within the country, but also between companies from different countries. The machine-building industry is one of the most knowledge-intensive, so the high level of capital consolidation allows the company to develop and implement the latest technologies in production. However, economically unreasonable application of the strategy of capital consolidation can lead to a negative economic effect [1].

The economic strategy of the enterprise is a long-term action plan aimed at achieving the goals with the help of certain tools. The company determines the basic development strategy based on the main components of the portfolio of enterprise strategies, such as analysis and assessment of competitive potential of the enterprise, technologies it owns, macro environment in which it operates, existing government regulation and competitors, suppliers and consumers. The basic development strategy can be growth, stabilization or reduction of the enterprise. Based on the chosen basic development strategy, the company chooses among certain strategic alternatives for development [7].

Considerable attention needs to be paid to creating a favorable business climate in cities, supporting small and medium-sized enterprises, developing an appropriate ecosystem, establishing effective cooperation between business and government, and reducing corruption. It is in this context that business associations, which can unite small machine-building enterprises, play an important role.

The location of machine-building enterprises in Ukraine is highly concentrated – almost 60 % of the income of machine-building in Ukraine is generated in 6 main regions: Zaporizhzhia region (16,9 %), Kyiv (12,3 %), Kharkiv region (11,3 %), Poltava region (6,3 %), Donetsk region (6,1 %) and Dnipropetrovsk region (6,0 %). This is clearly shown in the diagram in Figure 1.

The regional structure of mechanical engineering of Ukraine in 2019–2021 has undergone significant changes. In particular, due to the Russian aggression, the positions of Donetsk region (from 14,0 % to 6,1 %), Luhansk region (from 5,3 % to 1,0 %), Crimea (by 1,8 %) weakened. There was also a significant reduction in positions in Poltava and Dnipropetrovsk regions by 4,5 % and 1,9 %, respectively. On the other hand, most other regions increased their importance in the sale of machine-building products, of which the largest was Kyiv (by 7,3 %), Zaporizhzhia region (by 2,9 %), Kharkiv region (by 2,2 %) and Kyiv region at 2,2 %) [4].

On the positive side, the level of organization of business representatives in Ukraine has significantly increased in recent years: today machine-building enterprises are united by regional, professional, functional, organizational and legal characteristics, type of activity or focus on a particular business segment [6]. This case is mostly about the large cities and industrialized regions.

## Conclusions

Ukrainian engineering lags far behind developed countries and neighbors in the implementation of such technologies, and is only in its infancy. The most important way to ensure the effectiveness of the development of machine-building enterprises is the formation of adequate tools for strategic management.

The strategy of consolidation of capital in the engineering industry, aimed at achieving competitive advantage by manufacturers, strengthening their competitiveness in the global market and, ultimately, higher profits. Therefore, in order to increase the level of competitiveness of machine-building enterprises, it is necessary to stimulate and support processes aimed at consolidating capital, which can be manifested in various forms.

The potential for consolidating the business of machine-building enterprises is able to help raise the level of the national economy by achieving balanced interaction between the subjects of economic relations.

As a result of the merger, enterprises acquire the ability to produce innovative products that can replace imported goods and help increase the effective development of the country, even in the current difficult conditions of the corona crisis and Russian aggression.

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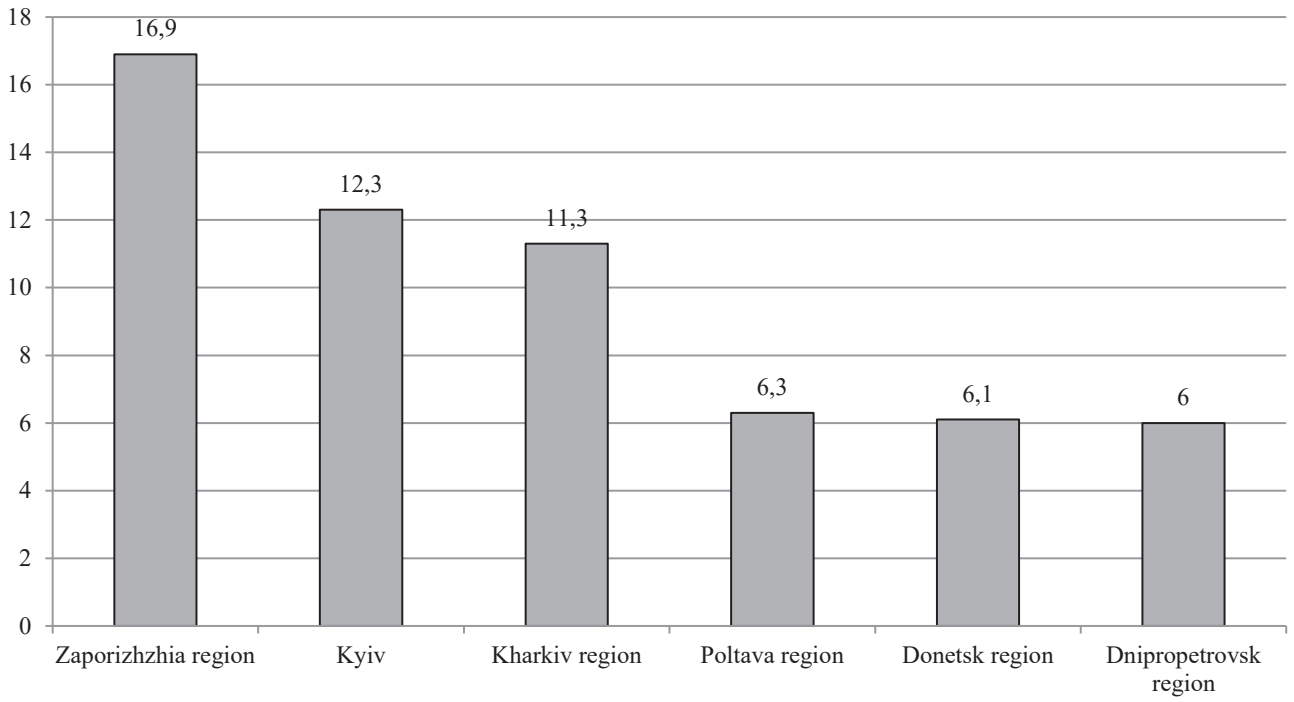


Fig. 1 – Regional structure of sales of mechanical engineering products in Ukraine in 2021, %

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# FEATURES OF TAX MANAGEMENT OF AGRICULTURAL ENTERPRISES OF UKRAINE IN A CRISIS

**Ohrenych Yu.O., Karmazina V.S.**
*Zaporizhzhia National University*
*Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 66*
yuliashvets@ukr.net, viktoria240401@gmail.com
ORCID: 0000-0002-0294-1889, 0000-0002-2176-4080

**Key words:**
tax management, taxation, agriculture, agro-industrial complex, investment, support program, crisis

It is substantiated that the development of the agricultural complex and investment support is one of the most promising tasks for Ukraine. A study of the specifics of the work of the State Tax Service was conducted and the mission, tasks, structure, possible problems, as well as the need to reform the structure were identified. Attention is also focused on the process of tax management of agricultural enterprises, the system of existing taxation is revealed, namely for the status of payers of the 4-th group of farmers, the budget revenues in the form of a single tax are analyzed. Important aspects of the tax collection procedure are considered. The article considers the efficiency of agribusiness in recent years. Statistical data on the dynamics of the share of agro-industrial complex in the structure of domestic GDP in actual prices, the amount of direct investment in agriculture and the dynamics of the share of agro-industry in the total dimension of direct investment are studied. International ratings for the production and export of agricultural products are analyzed. Statistics on changes in the amount of financing of the agro-industrial complex within the framework of state support programs, as well as foreign investors are summarized. Particular attention is paid to a detailed acquaintance with taxation and modern existing funding programs for the industry. The differences of last year's program of support of agriculture from the program of state support of APK-2021 in the context of growth of the sums directed on various directions are investigated. The main goal of the "Strategy to promote private investment in agriculture for the period up to 2023" is highlighted. Formed positive aspects and shortcomings of agricultural taxation. The ways of overcoming them in order to improve the management of corporate taxation and improve the investment climate in our country are identified.

# ОСОБЛИВОСТІ ЗДІЙСНЕННЯ УПРАВЛІННЯ ОПОДАТКУВАННЯМ СІЛЬСЬКОГОСПОДАРСЬКИХ ПІДПРИЄМСТВ УКРАЇНИ В УМОВАХ КРИЗИ

**Огренич Ю.О., Кармазіна В.С.**
*Запорізький національний університет*
*Україна, 69000, м. Запоріжжя, вул. Жуковського 66*

**Ключові слова:**
управління оподаткуванням, оподаткування, сільське господарство, аграрно-промисловий комплекс, інвестування, програма підтримки, криза

Обґрунтовано, що розвиток сільськогосподарського комплексу та його інвестиційна підтримка є одним з найперспективніших завдань для України. Проведено дослідження специфіки роботи органів ДПС та визначено місію, завдання, структуру, можливі проблеми, а також необхідність реформування структури. Також акцентовано увагу на процесі здійснення управління оподаткуванням сільськогосподарських підприємств, розкрито систему існуючого оподаткування, тобто статус платників 4-ї групи аграріїв, проаналізовано надходження до бюджету у вигляді єдиного податку. У статті розглянуто ефективність роботи агробізнесу за період останніх років. Досліджено статистичні дані щодо динаміки частки, яку займає АПК у структурі вітчизняного ВВП у фактичних цінах, суми прямих інвестицій у сільське господарство та динаміки частки агропромисловості у сукупному вимірі прямих інвестицій. Проаналізовано міжнародні рейтинги щодо виробництва та експорту сільськогосподарської продукції.

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Узагальнено статистичні дані щодо зміни сум фінансування АПК у рамках державних програм підтримки, а також іноземних інвесторів. Особливу увагу приділено детальному ознайомленню з оподаткуванням та сучасними діючими програмами фінансування галузі. Сформовано позитивні аспекти та недоліки оподаткування сільського господарства. Виокремлено шляхи їх подолання задля удосконалення управління оподаткуванням підприємств та покращення інвестиційного клімату в нашій країні.

**Statement of the problem**

Prospects for Ukraine's development depend on the gradual development and holding of leadership positions. Given the military operations in the East and the signing of the Association Agreement with the EU, the number of investment projects from the post-Soviet countries and Russia has decreased significantly (although new opportunities have emerged from the West). Accordingly, farmers are adapting to today's conditions, adjusting their work effectively, as evidenced by the positive dynamics of the agro-industrial complex of Ukraine. However, some instability in the industry emphasizes the need to improve the tax system, the implementation of tax management, the importance of implementing support programs.

**Analysis of recent studies and publications**

A significant contribution to the study of the development of the agro-industrial complex of Ukraine was made by such scientists as Matsybora T., who said about the importance of agricultural reform through state funding and constant monitoring of the current state of agro-industrial complex [1, p. 49]. Journalists-analysts and economists such as Matveychuk L. [2], Doroshenko A. [3], Sofienko N. [4; 5] and others are currently engaged in the analysis of agricultural taxation in Ukraine.

**Objectives of the article**

The purpose is to study the specifics of the work of the State Tax Service; features of tax management of agricultural enterprises; existing taxation systems; state of domestic agro-industrial complex; analysis of state and foreign programs to support farmers; identification of advantages, disadvantages, areas of improvement of corporate tax management.

**The main material of the research**

The role of the agricultural complex in the economy of Ukraine should not be underestimated, because looking at the experience of our country in overcoming powerful crises on political and economic grounds, it should be noted that the resources of the agricultural sector restrain the decline of the economy. Therefore, the development of agricultural enterprises and investment support of the industry both by the state and by foreign partners in times of constant lockdown is one of the strategic goals for Ukraine.

First of all, the attractiveness for investment in agribusiness depends entirely on the real state of development of the sector and the coherence of the state apparatus, including the State Tax Service. The State Tax Service of Ukraine (STS) is considered the central executive body, whose activities are directed and coordinated by the Cabinet of Ministers of Ukraine through the Minister of Finance and which implements state tax policy, state policy on administration of a single contribution to compulsory state social insurance [6].

The main mission of the State Tax Service is compliance with a transparent, modern and technological tax service, which provides quality and convenient services to taxpayers, effectively administers taxes, fees and charges and shows intolerance to corruption. Regarding the priority strategic goals of activity until 2022, they are as follows: creation of a single legal entity and effective management of activities; effective administration of taxes, fees, payments; image building as a European-style service with a high level of trust; counteracting tax evasion through the introduction of international standards and the improvement of analytical tools; formation of a qualified and motivated team [6].

Acting Chairman of the State Tax Service is Oleynikov E.V., headed by 3 deputies: Ruban N.I., Titarchuk M.I., Kalenichenko N.G. Considering the structure of the State Tax Service, it should be understood that currently the staff consists of 31 territorial subdivisions of the oblast and regional administrations, as well as 21 departments.

Since the departments have been reorganized, the main emphasis (in order to increase tax collection) should be placed on the qualitative growth of the staff of the State Tax Service. Also, such a large number of specialized departments leads to a number of such problems: duplication of the same functions by different bodies of the State Tax Service; underdeveloped specialization of tax authorities, as one employee has to perform a significant number of tax procedures in the field of activity of his department; maintaining a large percentage of management and service staff in relation to specialists in territorial tax inspections with a small number of employees; lack of clearly organized units responsible for informing taxpayers about changes in current legislation of Ukraine [6].

Reforming the structure of the tax service provides that in the future reduction and more coordinated work on the channels of communication of territorial bodies and departments of the State Tax Service, will reduce the cost of maintaining the staff, which will help direct the saved funds to temporary tax exemptions, such as support of agricultural enterprises [2; 7].

The procedure of collecting taxes on agro-industrial business ensures the filling of the state budget. However, it is important to maintain a balance between tax rates and the ability of agricultural producers to pay them on the one hand, and the subsequent ability of the same producers to borrow funds from government projects for their further development of their business and industry.

The amount of taxes depends on the chosen system, ie the general or simplified system of taxation. In the general

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system of taxation of sole proprietors, taxes are calculated on profits (18 % PIT, 1,5 % military tax, 22 % SSC). Farms-legal entities pay 18 % income tax, land tax (the amount depends on its amount), taxes on wages of employees. Self-employed persons and legal entities are registered as VAT payers (20 %). However, farms can also choose a simplified system and pay a fixed amount of a single tax, which will depend on the area of their agricultural land, rather than on profits [3].

Given that the main part of budget revenues comes from agriculture, it is important to consider the features of agricultural taxation, which are payers of the single tax of the 4th group. The object of taxation is the area of agricultural land (arable land, hayfields, pastures and perennials) and / or lands of the water fund (inland bodies of water, lakes, ponds, reservoirs), which is owned by the agricultural producer or provided to him for use, including on lease terms [8].

To annually confirm the status of the payer of the 4th group, farmers submit a declaration no later than February 20 of the current year. In case of non-submission of the declaration, a fine of UAH 340 is applied. For the same actions committed repeatedly, a fine of 1020 UAH is applied. The amount of tax is calculated independently as of January 1 and submitted to the relevant controlling body of the State Tax Service at the location of the land plot. The single tax is levied quarterly at the rates of: I quarter – 10 %; II quarter – 10 %; III quarter – 50 %; IV quarter – 30 %. But tax rates depending on the type of land and their location are differentiated by category and range from 0,19 % to 6,33 %. In addition, the payers of the single tax of the 4th group keep a simplified accounting of income and expenses [6].

For farmers of the studied group is also possible exemption from land tax for the period of application of the simplified system, income tax, personal income tax, VAT on transactions for the supply of goods, services, works, the place of supply of which is located in the customs territory of Ukraine (except VAT, paid to persons who have chosen the rate of the single tax), property tax in part of the land tax, rent for special use of water [8].

As the payers of the single tax of the 4th group were exempted from paying VAT until 01.01.2017, at the beginning of 2017 after the entry into force of the amendments to the Tax Code, farmers are deprived of a special regime for VAT. The loss of the right to a VAT refund from the budget has led to the fact that the purchase of fixed assets costs agricultural organizations 20 % more [9; 10].

If the income is higher than defined for the simplified system of the 4th group, such taxpayers are obliged to pay in the current year a tax of 25 % of the annual amount of tax for each quarter and from the next tax (reporting) quarter to apply the single tax rate, defined for single tax payers of the 3rd group, or to refuse application of the simplified system of the taxation [6].

To understand the real situation in Ukraine on the receipt of a single tax in the budget, it is advisable to analyze statistical data on Ukraine. Thus, inflows of funds according to the Consolidated Budget of Ukraine amounted to 32000,4 million UAH for January-September 2021, which compared to January-September 2020 is a 21,1 % increase, or an increase of 5574,8 million UAH for the current year. Since the reports of local authorities are used to summarize the data, the example of Zaporizhia region shows that revenues for the period February-August 2021 increased compared to 2020 in each month (Fig. 1). In the last covered period (August) the growth by 35,6 % for the year was demonstrated [11; 12].

It is worth noting that according to the State Statistics Service, 22 % of all officially and informally employed people are employed in agriculture and the rural population is 31 % (14 million people) of the total population of Ukraine [13].

The share of agriculture in Ukraine's GDP is quite significant. Thus, in the overall structure, this industry took about 9,27 % in 2020 compared to 2019, when the agro-industrial complex occupied 8,97 %. This demonstrates the positive results of the development of the agricultural complex, although compared to 2018 (the share of agriculture was 10,14 %) there is a slight decrease in the share by 0,88 %. According to the latest updated statistics, the rural, forest and fishing industries accounted for about 2.8 % of GDP in the first quarter of 2021, when last year it was 2.81 for the same period. Such changes are caused mainly by climatic conditions (Fig. 2).

Ukraine occupies a leading position among countries engaged in foreign trade operations for the export of agricultural products. Thus, the share of agricultural exports in the total dimension of Ukraine's exports amounted to 45,1 % at the end of 2020 and 35,2 % only for the period January-July 2021. In total for the investigated period of the current year products on 12493 million dollars USA were exported, which showed a 7 % increase

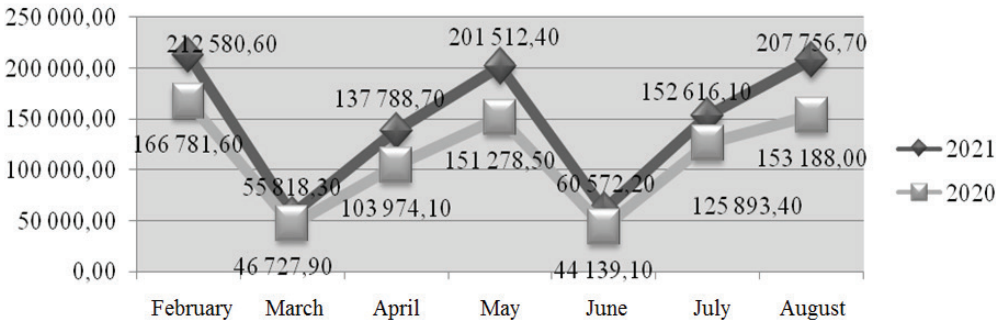


Fig. 1 – Receipt of the single tax in the budget of Ukraine in the Zaporizhzhia region, thousand UAH

Source: compiled by the authors on the basis [12]

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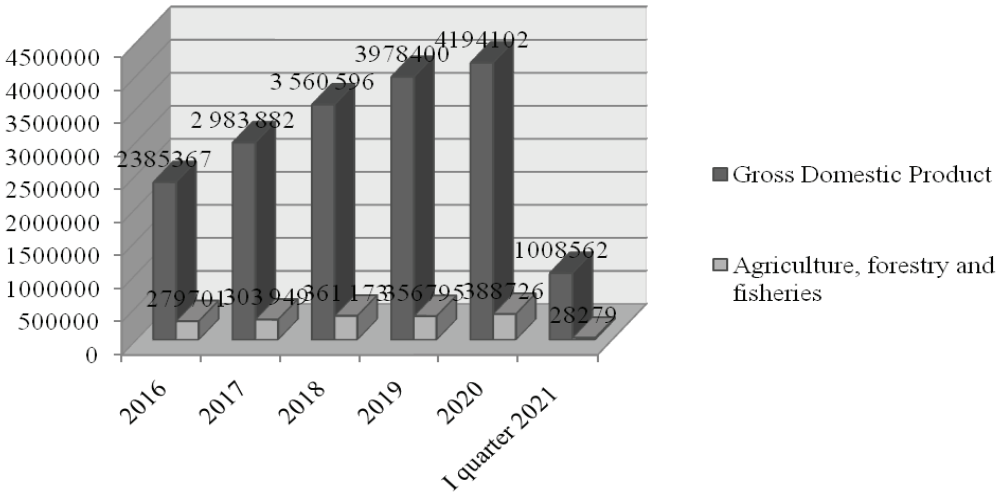


Fig. 2 – Dynamics of the share of agriculture in the structure of GDP in actual prices, UAH million

Source: compiled by the authors on the basis [13]

over the corresponding period in 2020. However, it should be noted that the import of foreign agricultural products amounted to about 19% growth, which calls into question the leadership in foreign trade of these types of goods around the world. The largest partners in the export of cereals, oils, oilseeds were the following countries: China (19,4%), India (7,8%), the Netherlands (7,3%), Egypt (5,7%), Iceland 4,3%), Turkey (3,5%) [14].

According to the results of last year, Ukraine has 1st place in the international arena in the export of sunflower oil, 2nd place – barley, 4th place – corn, as well as leadership in the export of wheat, butter, oilseeds, cakes, 7th place in the export of poultry meat [15].

The analytical agency Index Mundi predicted that Ukraine will be the world leader in the growth rate of poultry meat production in 2020, and indeed this figure increased by almost 9% that year [14].

Ukrainian villages do not have sufficient own resources to become more financially secure, and do not yet have the opportunity to use borrowed funds, as it is difficult to calculate the profitability of this industry, which depends on many factors and this indicates the importance of investment support.

The constant fluctuations in the inflow of direct investment, which is especially noticeable for the agro-industry, have become one of the main reasons for the need for state intervention in the financing of small and medium-sized businesses. The analysis shows a gradual increase in investment in agriculture, but at the same time there is a decrease in 2019 by 126,7 million dollars. However, the situation is improving at the end of 2019, which is an indicator of increasing direct investment. It should be noted that a similar situation is observed in the dynamics of the share of investment in agriculture in total direct investment. At the beginning of 2020, the share was approximately 1,51% (Fig. 3).

According to the data, the agro-industrial complex of our country is developing unstable. Therefore, in 2019, farmers used UAH 4,34 billion. state support. In total, it was used by 1667 businesses and 230925 individuals, about 10000 farmers and 2 agricultural cooperatives [15].

The Ministry of Economic Development, Trade and Agriculture of Ukraine has implemented a program to support AIC2020, so in accordance with the «Procedure for using funds provided in the state budget for financial support of measures in the agro-industrial complex by reducing loans», approved by the Cabinet of Ministers of Ukraine from April 29, 2015 № 300 (as amended), it was stipulated that the land reform should implement the simplification of access of small and medium enterprises (up to 500 hectares) to bank loans. UAH 4,24 billion was allocated from the budget for the project, of which UAH 4 billion was allocated to various areas, including funds for the development of animal husbandry, horticulture, farming, viticulture, and hop growing [16].

Domestic investment projects are also planned for 2021. In the amount of financial resources compared to 2020, there is a clear increase in most areas (Table 1).

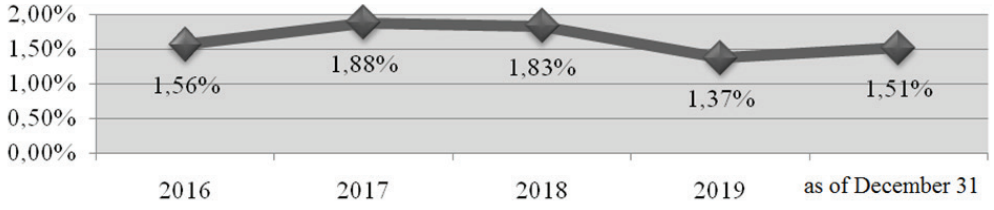


Fig. 3 – Dynamics of the share of agriculture in the amount of direct investment in Ukraine

Source: compiled by the authors on the basis [13]

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Table 1 – State support programs of the agro-industrial complex of Ukraine in 2020–2021, UAH million

| State support programs of the agro-industrial complex of Ukraine | 2020 | 2021 |
|---|---|---|
| Partial compensation of the cost of agricultural machinery of domestic production | 1482,2 | 1000 |
| Cheaper loans at the expense of investment funds | 1053,5 | 1200 |
| Support for horticulture, viticulture, hop growing | 290 | 450 |
| Support for farm development | 102,8 | 200 |
| State support of animal husbandry and processing of agricultural products | 1039,1 | 1150 |

Source: compiled by the authors on the basis [17]

The program «Affordable loans 5–7–9%» is currently effective. The greatest interest in preferential lending to crop production and the discoverer was a farmer A. Vecheruk from Vinnytsia, engaged in the cultivation of cereals, legumes, oilseeds [15].

According to the latest information provided by the agro-industrial development departments of regional state administrations, as of July 1, 2019, 444 investment projects worth over UAH 40,6 billion have been prepared and implemented in all regions of Ukraine [14].

According to the Department of Information and Public Relations of the Secretariat of the CMU, Ukraine raised its investment rating in Doing Business 2020 (index of ease of doing business in the world) by 7 positions at once. The budget for 2021 included the possibility of attracting UAH 1 billion 176 million of foreign investments in the agro-industrial complex. For Ukraine, the EU in 2020 allocated a package of support for small and medium-sized businesses, where 25 million euro's are allocated to small farms [15].

For example, in February 2021, a memorandum was signed with the world's largest international investment fund, the United Arab Emirates's Mubadala Investment Company, which has assets of more than 850 billion dollars on the project to encourage investment in agriculture and promote the development of trade in agro-industrial products. The UAE plans to increase the trade turnover of agro-industrial products with Ukraine 10 times and bring this figure to 2 billion dollars per year [18].

In September 2021, the Verkhovna Rada ratified the Protocol between the Governments of Ukraine and the United Arab Emirates amending the agreement between the two countries on the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income and capital, including on agricultural enterprises. The main provisions provide for an increase in the tax rate of interest in the country that is the source of income from 3% to 5%, as well as an increase in the tax rate of «technical» royalties from 0% to 5% in the country that is the source of income [6; 11].

New technologies in the agro-industrial sector are of interest to foreign and domestic investors. One of the best programs that helped put agriculture on a new level of development in Ukraine were such projects as «DrT-Tech», «Smart Apiary i-bee» [15].

Also, the Government has developed a «Strategy to promote private investment in agriculture until 2023», the main purpose of which is to increase exports of agro-industrial products, food security and environmentally balanced growth of Ukraine's agro-industrial complex [19].

As this strategy considers the complex procedure of receiving state aid funds as well as the imperfection of the tax system as issues, for the development of the economy it is worth paying attention to the implementation of tax management. It is important to implement reforms in the management of taxation and tax regulation of the agro-industrial complex, in order to achieve such a goal as the stability of tax revenues from farmers to the budget.

It is important to implement reforms in the management of taxation and tax regulation of the agro-industrial complex, in order to achieve such a goal as the stability of tax revenues from farmers to the budget.

However, the effectiveness of agricultural tax management is hampered by the crisis caused by the Covid-19 pandemic. Therefore, to overcome the consequences caused by many events, including the coronavirus pandemic, the Government has adopted a number of bills with a package of tax benefits for businesses. In particular, the changes affected farmers in the following areas: increasing the income limit for single tax payers; tenants are temporarily exempt from land fees and real estate tax; the business is exempt from the application of certain penalties; introduced a moratorium on certain types of inspections [6].

The biggest change in the taxation of farmers was the changes made on March 1, 2021. According to the Law of Ukraine of December 17, 2020 № 1115-IX «On Amendments to the Tax Code of Ukraine on the value added tax rate on transactions for the supply of certain types of agricultural products», transactions on the supply and import of certain types of agricultural products are subject to VAT 14 percent (was reduced from 20%) on transactions for the supply of customs products in the customs territory of Ukraine and the import of agricultural products into the customs territory of Ukraine. Such exemption for imports of such goods continues. All agricultural products are exported at the usual export rate – 0% [6].

Thus, taking into account the experience of our state in agricultural taxation, we can identify the following positive features of taxation of agricultural enterprises: tax incentives to attract investment in the economy of the industry; environmental taxation is closely linked to this area; special procedure for making tax payments; special procedure of land taxation as an important resource of production; use of a single tax for the 4th group; possibility to choose between a simplified and a general taxation system.

However, the disadvantages of the taxation system of agricultural enterprises are: imperfection of the regulatory framework; gradual abolition of tax benefits for the agro-industrial complex, which helps to strengthen the competitive position of more powerful businesses and their absorption of small farms that are unable to withstand the tax burden; ignoring the specifics of food

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production in agriculture; greater focus on big business, neglect of small businesses; lack of a clear short-term strategy for agricultural development in combination with long-term goals of the State Tax Service; loss of the possibility of VAT refund from the budget; lack of modern tools for tax management and tax regulation; non-introduction of foreign experience in taxation of agricultural enterprises [9].

Taking into account the conducted research, the following directions of improvement of agrarian taxation management and taxation mechanism can be distinguished: development of the state strategy of tax policy; clear delineation of state functions and market self-regulation in agricultural tax policy; construction of a taxation system based on land fees and a uniform tax burden, taking into account the profitability of agricultural production; providing small businesses with objective tax benefits in combination with support programs APK-2021; introduction of convenient and affordable services for taxpayers; support of agriculture by the State Tax Service; ensuring the stability of the tax collection mechanism, which will allow producers to adapt to changes and clearly determine for themselves the optimal tax option (general or simplified system); revision of the tax base for single tax payers of the fourth group every year; informing about changes in legislation and taxation procedures by creating an official portal, e-mailing to all farmers [10].

Also, improving the taxation system in this area, taking into account the seasonality of agricultural production, the introduction of direct and indirect taxation with an emphasis on the importance of increasing the competitiveness of agriculture in domestic and foreign markets of Ukraine, would be a positive step in reforming the tax mechanism.

So, the coordinated active work of government within the country, the implementation of state regulation and management of taxation of agricultural enterprises in an unstable market environment, the use of support programs for farmers is a priority step to take a leading position in agricultural markets, increase investment attractiveness.

## Conclusions

So, the system of taxation of agricultural enterprises is complex and needs to be improved through the implementation of tax management in a changing market environment. A study of the specifics of the State Tax Service, the peculiarities of tax management, the tax system, the state of the domestic agro-industrial complex and identified the advantages, disadvantages, areas of improvement of corporate tax management. It has been established that small businesses will benefit from a tax vacation for several months in the form of exemption from paying the single tax, as well as support in terms of reducing the SSC for the period of quarantine and lockdown. State programs to support farmers and support innovative projects also play an important role in the development of agricultural enterprises.

Thus, the domestic agricultural sector has great potential, which draws the attention of both our state and foreign investors. Research has shown that it is difficult for the agro-industry to bear the tax burden even in terms of profitability, and given the specificity of the industry due to yields and climatic conditions, this can lead to a lack of finances to cover mandatory tax payments. And only economic stability is closely linked to perfect taxation, which can provide confidence in the profitability of investing in the agro-industrial complex of Ukraine.

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# PROBLEMS OF DEVELOPMENT OF METALLURGICAL INDUSTRY OF UKRAINE AND WAYS OF THEIR SOLUTION

**Sarnatskiy O.P., Ilchenko D.A.**
*Zaporizhzhia national university*
*Ukraine, 69000, Zaporizhzhia, Zhukovskij str., 66*
asarnackiy54@gmail.com, 11diana1198@gmail.com

**Key words:**
metallurgical industry, export, competitiveness, fixed assets, modernization

The article is devoted to the research of the main problems of metallurgical industry of Ukraine. The article substantiates that the metallurgical industry of Ukraine faces both external factors that affect competitiveness of domestic metallurgical products, as well as internal factors that hinder effective development of the industry. It was determined that in 2020 the volume of metallurgical products exports accounted for one-fifth of total Ukrainian exports of goods and services. The structure and dynamics of exports of metallurgical products in 2012–2020 have been analyzed. It was determined that the metallurgical industry of Ukraine is mainly focused on the export of crude products – ferrous metals. It was revealed that low level of domestic metal products consumption has being observed in Ukraine during recent years. It was investigated that obsolete production assets and inefficient production technology are used at domestic industrial enterprises. It has been proved that the main directions of solving of the metallurgical industry problems are the following: increase of domestic consumption of metallurgical products and modernization of the fixed production assets of metallurgical enterprises.

# ПРОБЛЕМИ РОЗВИТКУ МЕТАЛУРГІЙНОЇ ПРОМИСЛОВОСТІ УКРАЇНИ І ШЛЯХИ ЇХ ВИРІШЕННЯ

**Сарнацький О.П., Ільченко Д.А.**
*Запорізький національний університет*
*Україна, 69000, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
металургійна галузь, експорт, конкурентоспроможність, основні виробничі фонди, модернізація

Стаття присвячена дослідженню основних проблем металургійної галузі України. У статті обґрунтовано, що металургійна галузь України стикається як з зовнішніми факторами, що впливають на конкурентоспроможність вітчизняної металургійної продукції, так і внутрішніми чинниками, що стримують ефективний розвиток галузі. Визначено, що у 2020 році обсяги експорту металургійної продукції склали п'яту частину загального експорту товарів і послуг України. Проаналізовано структуру та динаміку експорту металургійної продукції за 2012–2020 роки. Встановлено, що металургійна галузь України більше зорієнтована на експорт сировинної продукції – чорних металів. Виявлено, що останні роки в Україні має місце низький рівень внутрішнього споживання металопродукції. Досліджено, що на вітчизняних промислових підприємствах використовуються застарілі виробничі фонди та неефективна технологія виробництва. Доведено, що основними напрямками вирішення проблем металургійної галузі є збільшення внутрішнього споживання металургійної продукції і модернізація основних виробничих фондів металургійних підприємств.

## Introduction

The Ukrainian metallurgical industry has known to be one of the largest in terms of production and exports since Soviet times. The metallurgical industry is strategically important for the development of domestic economy. However, despite the fact that the metallurgy is still one of the most powerful sectors of the Ukrainian economy and accounts for almost a one-fifth of its merchandise exports, the volume of metal production is decreasing from year to year. Therefore, substantiation and solution of development problems of the metallurgical industry of Ukraine is important and urgent task.

## Analysis of recent researches

The problems and prospects of metallurgy in Ukraine have been studied in recent years by many domestic researchers, including: V. Bolshakov, V. Mazur, S. Kulitsky, O. Klenin, O. Andriichenko, A. Amosha, A. Pivovarsky and others. At the same time, there is a lack of research on the current state peculiarities, problems and prospects for the development of metallurgical enterprises in Ukraine in modern conditions.

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**Objective**

To determine problems of development of metallurgical enterprises of Ukraine and work out recommendations to increase their competitiveness.

**Presentation of the main research material**

The first reason for the decline in exports of metallurgical products is the excessive metal production in the world and tough competition. Almost every country has its own metallurgical facilities today.

The situation is aggravated by the crisis of the world economy, which is accompanied by decrease in the production of finished metal products and low steel prices. Ukraine was also affected by the necessity to reduce metal products prices, while the price on iron ore, which is a raw material for metallurgical production, remains quite high.

The above mentioned has triggered a process of protectionist measures in a number of countries trying to protect their producers and metals market. The United States, for example, in 2018 introduced customs tariffs on imports of steel and aluminum and EU imposed import quotas on metallurgical products [1].

In general, due to the global crisis, companies in all countries have reduced manufacturing of metallurgical products, so the decline of production in Ukraine is a consequence of external trends.

However, another problem of Ukraine is that domestic consumption of metallurgical products does not keep up with production volumes. The average surplus was about 80% in recent years [2]. As a result, it is necessary to sell surplus metal products in the foreign market and the metallurgical industry is therefore becoming even more vulnerable to global fluctuations. Despite the fact that most of the products are exported, the supply of metal products on the world market exceeds demand and competition intensifies. This will lead to the «survival» of the world's most efficient metallurgical enterprises.

As for the internal problems of production, the metallurgical enterprises of Ukraine face the problem of obsolete equipment and fixed assets. Since the days of Soviet rule Ukrainian metallurgy has been characterized by high energy consumption due to use of open-hearth furnaces and inefficient technology of molten steel teeming into ingot molds at many enterprises. The use of open-hearth furnaces is the result of iron ore rich deposits in Ukraine, which is a raw material for two stage steel smelting, while modernized electric furnaces require more expensive and scarce scrap metal as a raw material. In general, open-hearth furnaces are still used only in Ukraine and Russia, but in Russia open-hearth steel accounts for about 3% of production, and in Ukraine it reaches one-fifth of steel production. This negatively affects the competitiveness of Ukrainian metal products [3].

The viability of Ukrainian metallurgical enterprises has also deteriorated significantly since 2014, when the conflict with Russia began, leading to the loss of the south-eastern regions, where metallurgical production facilities were concentrated. And businesses have become uncontrolled as a result of blockade of supplies from these areas. It is obvious that enterprises were forced to reduce their staff simultaneously with the reduction of production volumes.

Some companies are forced to reduce investment programs, which leads to complete stagnation of the industry. However, the reduction of specialists to date affects mainly administrative staff while investment projects envisaged by technological strategy and related to impact on the environment are in progress.

In the world market Ukraine is perceived as a country capable of producing mainly crude products. This position is due to inability to produce quality goods with high added value as a result of low competitiveness of Ukrainian enterprises with their outdated equipment and inefficient production technology.

Figure 1 shows the types of goods and services that account for the largest shares in Ukrainian exports in 2020.

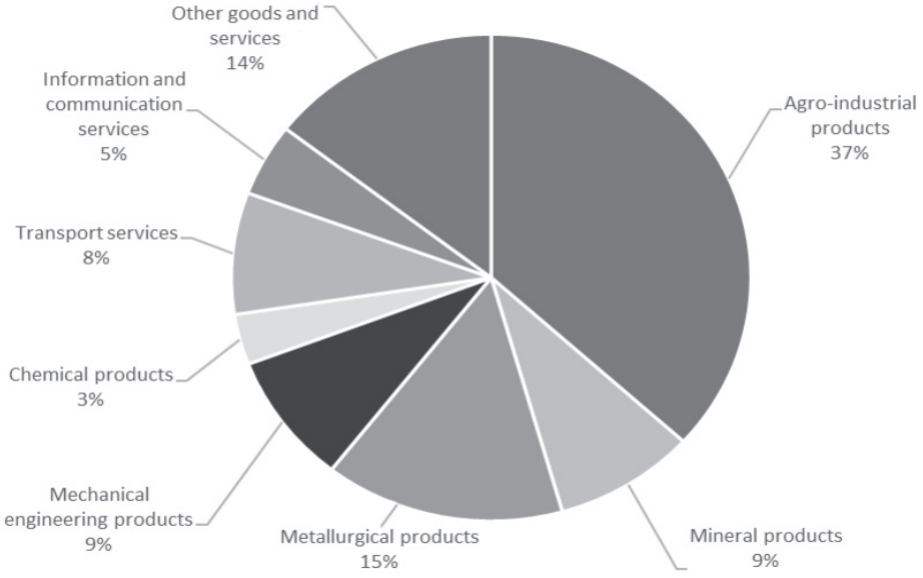


Fig. 1 – The structure of exports of goods and services of Ukraine in 2020

Source: compiled by the authors on the basis of [2]

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Metallurgical products account for 15% of exports of goods and services in 2020 as depicted in Figure 1 and ferrous metallurgy is the second largest industry in terms of exports. Contemporary exports of metallurgical products account for almost one-fifth of total exports of goods. However, as already mentioned, the volume of exports of metal products in recent years has being declining. Figure 2 represents the dynamics of the volume and structure of exports of domestic metallurgical products.

The Ukrainian metallurgical industry is represented in foreign markets by ferrous metals. Crude metallurgical products and raw materials dominate in the structure of exports, finished ferrous metal products account for a much smaller share of production than unprocessed ferrous metals. This again causes the problem of raw material orientation of Ukraine. In addition, Figure 2 shows that the volume of ferrous metal products decreased by 5.2 percentage points during the period 2012–2020, from 14.9% to 9.7% respectively. The share of ferrous metals in total exports of metals, in contrast with above digit, increased by 3.8 percentage points during the same period of time. The problem, as well as for the agro-industrial sector, is partly due to obsolete production assets, the depreciation of which in the metallurgical industry in 2020 amounted to 55.8%.

The exports decline in 2016 is due to reduction in metallurgical enterprises manufacturing as a result of conflict aggravation in the south-eastern Ukraine.

As have been already mentioned, the primary problem of the metallurgical industry in Ukraine is not the reduction of exports and not even the dominance of raw and crude materials in its structure, but the lack of domestic consumption of metal products. Figure 3 depicts the ratio of domestic consumption of metal products to steel output for 2013–2018.

The volume of domestic steel consumption is only about 20% of production, which means the dependence of the metallurgical industry on exports. Currently, Ukraine is a net exporter of metallurgical products. But in recent years, the share of Ukrainian metallurgical products in the world production has declined significantly, while China and India have come to the dominant positions at the same time, which are quite competitive. This situation requires from Ukrainian

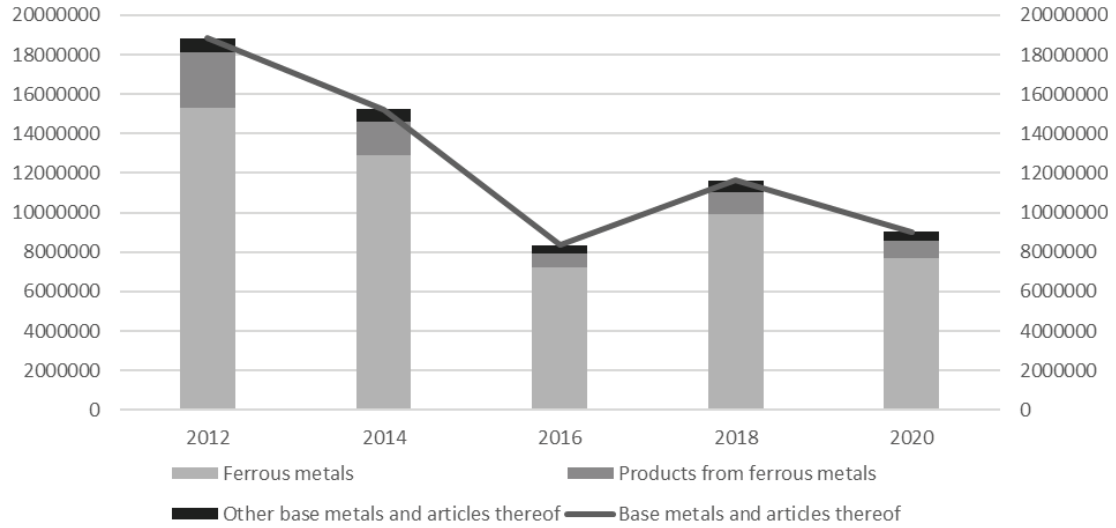


Fig. 2 – Dynamics of exports and the structure of the metallurgical industry of Ukraine in 2012–2020
Source: compiled by the authors on the basis of [2]

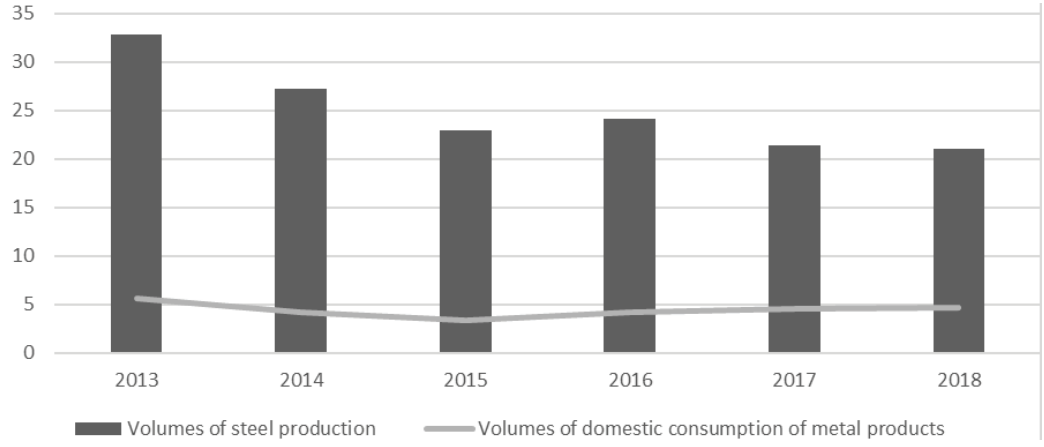


Fig. 3 – Dynamics of the ratio of domestic consumption of steel products to steel output in 2013–2018, million tons
Source: compiled by the authors on the basis of [2]

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enterprises either to improve the quality of metal products up to the world standards, or to reduce imports of metallurgical products by expanding domestic consumption.

According to the World Steel Association: «The technological process of steel smelting in Ukraine is inefficient compared to world figures, and due to the use of open-hearth furnaces and technology of molten steel teeming into ingot molds is excessively energy-intensive» [4]. However, as have been mentioned earlier, although open-hearth furnaces require high energy consumption, they need cast iron made of iron ore as a raw material, which Ukraine has in large quantities. Whereas electric furnaces require more expensive and scarce charge materials – scrap, although scrap recycling is less energy consuming.

Last but not least is the problem of fixed assets modernization at metallurgical enterprises. The development of our own production facilities is the ultimate goal of modernization and innovation, but this process is long-term and will take at least a decade. Even complete equipping of Ukrainian enterprises with new means of production will not be possible in 7–10 years, if only the own funds of companies are assumed to be used as is observed today. Based on the fact that the development and commissioning of upgraded production facilities takes at least 10 years, it would be more appropriate to use other opportunities to borrow technologies. This modernization trend, surely, is already used by Ukrainian manufacturers and the most prevalent is import of machinery and equipment [5].

However, borrowing can also take other forms, such as:

1) copying and reproduction of samples of equipment;
2) creation of joint ventures with foreign owners of technologies;
3) joining technological alliances;
4) acquisition of production assets under the leasing scheme.

## Conclusions

Thus, in the context of the crisis of the world economy, lack of domestic consumption of metallurgical products, high energy intensity of production and low level of metal products competitiveness compared to world analogues, Ukraine should take measures to develop its metallurgical industry. First of all, Ukraine should promote sales of metallurgical products in the domestic market reducing the dependence of production on global fluctuations. Implementation of innovations at metallurgical enterprises would reduce the energy intensity of products and their cost. New technological solutions would also facilitate manufacturing improvement and diversify the product range, reduce ecological pressure on the environment. The state, in turn, could improve the relationship between investors and enterprises, scientific cooperation between science and manufacturing, as well as determine the scope and priorities in financing scientific and technical activities aimed at the development of the metallurgical industry.

It is essential to modernize production facilities in order ensure compliance of domestic metal products with requirements of both foreign and domestic markets, reduce production energy intensity and, as a consequence, increase the efficiency of the manufacturing process. The reduction in exports will lead to less dependence of the metallurgical industry on global fluctuations as in the case of the export-oriented agricultural sector.

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# MODERN GOING IS NEAR MANAGEMENT OF ENTERPRISE COMPETITIVENESS

**Tkachenko S.M.**
*National University "Zaporizhzhia Polytechnic"*
*Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 64*
space7770@ukr.net

**Key words:**
management of enterprise, competitiveness, industrial enterprises, potential of competitiveness of enterprise, strategic management of enterprise, possibilities of competitors, economic subject, competitive commodity, a competitiveness, a competitiveness

In the article it is considered research-and-development modern methodical going near the management of enterprise a competitiveness. The author of the article is investigate the modern going near the management of enterprise a competitiveness. The modern mechanism of management a competitiveness is considered, that becomes one of major tasks of enterprise, without the decision of that to the producer it is difficult to survive at the market in the conditions of competition and to get a desirable result from the activity. Reasonably, that for a successful management a competitiveness it is needed to study a market, correctly to estimate the competitiveness, possibilities of competitors and factors that they are determined. Attention is accented on that the competitiveness of enterprise can be defined as a potential or realized capacity of economic subject for the effective of long duration functioning in a relevant environment. It is important to carry out such management that will provide adjusted of enterprise to the different unforeseen situations in the future. Certainly, that going into a market with a competitive commodity – it only initial, initial moment in-process enterprise from market development and fixing on him, and difficult, systematic work is farther conducted from the management of enterprise a competitiveness. A competition market environment is analysed in the article highly, and certainly that it stipulated the necessary forming of going near the management of enterprise a competitiveness. It is set that a process of forming of competitiveness is difficult and unites the elements of both internal and external surroundings, where important are determinations of factors, that influence on a management a competitiveness. Drawn conclusion, in relation to worked out control system of events in relation to the exposure of functions, real processes of management of enterprise a competitiveness and the specified requirements that is produced to the object of management of project control system in accordance with the theory of management. Therefore, for that the economy of the state functioned and provided the competitiveness, it is necessary to build the innovative system thus, to combine scientific and technical potential of regions with the complex of economic events, what called to assist rapid commercialization on internal and external markets. Thus exactly this way and will come forward as motive force for the achievement of success with activity of enterprises.

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# СУЧАСНІ ПІДХОДИ ДО УПРАВЛІННЯ КОНКУРЕНТОСПРОМОЖНІСТЮ ПІДПРИЄМСТВА

**Ткаченко С.М.**
*Національний університет «Запорізька політехніка»*
*Україна, 69063, м. Запоріжжя, вул. Жуковського, 64*

**Ключові слова:**
управління конкурентоспроможністю підприємства, конкурентоспроможність, промислові підприємства, потенціал конкурентоспроможності підприємства, стратегічне управління конкурентоспроможністю підприємства, можливості конкурентів, економічний суб'єкт, конкурентоспроможний товар

У статті розглянуто дослідження та розробка сучасних методичних підходів до управління конкурентоспроможністю підприємства. Автором статті досліджуються сучасні підходи до управління конкурентоспроможністю підприємства. Розглянуто сучасний механізм управління конкурентоспроможністю, який стає однією з найважливіших задач підприємства, без рішення якої виробникові важко вижити на ринку в умовах конкуренції та отримати бажаний результат від своєї діяльності. Обґрунтовано, що для успішного управління конкурентоспроможністю потрібно вивчати ринок, правильно оцінювати свою конкурентоспроможність, можливості конкурентів і чинники що їх визначають. Акцентовано увагу на те, що конкурентоспроможність підприємства можна визначити як потенційну або реалізовану здатність економічного суб'єкта до ефективного

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довготривалого функціонування у релевантному зовнішньому середовищі. Важливо здійснювати таке управління, яке забезпечуватиме пристосованість підприємства до різних непередбачених ситуацій у майбутньому. Визначено, що вихід на ринок із конкурентоспроможним товаром – це лише початковий, вихідний момент у роботі підприємства з освоєння ринку і закріплення на ньому, а далі проводиться складна, систематична робота з управління конкурентоспроможністю підприємства. У статті проаналізовано високо конкурентне ринкове середовище, та визначено що воно зумовило необхідне формування підходів до управління конкурентоспроможністю підприємства. Встановлено, що процес формування конкурентоспроможності є складним і об'єднує елементи як внутрішнього, так і зовнішнього оточення, де важливим є визначення чинників, які впливають на управління конкурентоспроможністю. Зроблено висновок, стосовно розробленої системи управління заходів щодо виявлення функцій, реальних процесів управління конкурентоспроможністю підприємства та уточнені вимоги, які пред'являються до об'єкта управління проектної системи управління відповідно до теорії управління. Тож, для того щоб економіка держави функціонувала й забезпечувала свою конкурентоспроможність, треба побудувати інноваційну систему таким чином, щоб поєднувати науково-технічний потенціал регіонів із комплексом економічних заходів, які покликані сприяти швидкій комерціалізації на внутрішніх та зовнішніх ринках. Отже саме цей шлях і буде виступати рушійною силою для досягнення успіху в діяльності підприємств.

**Statement of the problem**

For a successful management a competitiveness it is needed to study a market, correctly to estimate the competitiveness, possibilities of competitors and factors that they are determined, Modern to the mechanism of management a competitiveness becomes one of major tasks of enterprise, without the decision of that to the producer it is difficult to survive at the market in the conditions of competition and to get a desirable result from the activity.

**Analysis of recent studies and publications**

A ponderable contribution to theoretical and practical researches of problems of competitiveness is testified by developments of such foreign and home scientists: V. Aleshenko, G. Azoyeva, I. Ansoffa, A. Gradova, G. Balabanova, M. Porter, I. Ansoff, F. Kotler, A. Tompson, G. Azoyev, A. Gradov, L. Balabanova, M.G. Bilopolskij, B. Burkinskij, F. Virsema, A. Voronkova, V. Dikan, N. Drobitko, S. Yerohina, G. Krivenko, P. Zav´yalova, Yu. Ivanova, Ye. Lapina, K. Makkonela, O. Tridida, R. Fathutdinova, H. Fashiyeva, O. Chelenkova, O. Carenko [1–7].

The competitiveness of enterprise can be defined as a potential or realized capacity of economic subject for the effective of long duration functioning in a relevant environment. It is important to carry out such management that will provide adjusted of enterprise to the different unforeseen situations in the future. Going into a market with a competitive commodity – it only initial, initial moment in-process enterprise from market development and fixing on him, difficult, systematic work is farther conducted from the management of enterprise a competitiveness.

**Objectives of the article**

The aim of this article is determination, research-and-development modern methodical going near the management of enterprise a competitiveness.

**The main material of the research**

Highly a competition market environment stipulated the necessary forming of going near the management of enterprise a competitiveness. A process of forming of competitiveness is difficult and unites the elements of both internal and external surroundings, important are determinations of factors, that influence on a management a competitiveness [1].

One of main factors of increase of level of competitiveness of enterprise there is also determination of innovative technologies and modern technique in the process of activity. It is needed to proceed in an enterprise materially a technical base taking into account innovations, because exactly in modern terms exactly an innovative type of behavior of performer of entrepreneurial activities is the means of survival and functioning at the market [2].

A management a competitiveness accepts character of state influence on the economy of country. In the conditions of market economy the state is not provided with the function of direct management a competitiveness. The state does not manage a competitiveness, but influences on her by means of different events of adjusting – legislative and підзаконних acts, governmental resolutions, economic and other instruments [3].

The main task of the state consists in that, to create favourable terms for strengthening of competitiveness of economy on the whole and her component parts: industries and separate producers [4].

Influence of the state on a competitiveness comes true after intra-national and external directions. Both these directions closely co-operate inter se: external factors are connected for the decision of internal problems [5].

One of levers of influence there is a public policy on the competitiveness of enterprise. What is sent to strengthening of competition positions of national industry through development of certain measures in relation to an assistance to development of the most perspective industries

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and industrial companies, creation of joint ventures with the aim of increase of their competitiveness, stimulation of export and use of external economic connections as to the means of increase of efficiency of industrial complex and his profitability [6].

One of necessary terms of competitiveness of producers of industrial wares is their being informed about a market, possibilities and behavior of competitors, innovation and many other descriptions, that allows to them to have a complete idea about an environment, his progress trends in current moment and in a prospect. Only at such condition a company-producer can be guaranteed against painful surprises, and consciously to form and carry out the scientific and technical, productive, sale politics, able to resist to the competitors. Already in force of it public organs must give to the companies – producers for support of their competitiveness considerable informative and consultative services [7].

Mechanisms of management a competitiveness, as well as any mechanism of management on the whole, envisages a presence, from one side, subject, and from other – object of influence. If at macroeconomic level the subject of management a competitiveness are public organs, and by an object is all economic infrastructure of country, then on a microlevel an enterprise comes forward as a subject of management, and by an object all his component potential.

Consideration of mechanism of management a competitiveness has the special practical meaningfulness on a microlevel, as really a management a competitiveness comes true at the level of producers. Exactly enterprises own necessary resources, enterprise initiative, shots.

From ability, depends purposefulness of producers in what measure they can use the internal potential and to possibility of environment, that is formed by the state on the achievement of the put aims and high level of competitiveness.

As it was already talked higher, it is possible to consider competitive enterprises those managing subjects that in the economic activity arrive at the put aims, here giving competitive goods and services to the consumer.

In turn, the mechanism of management of enterprise a competitiveness shows a soba totality of facilities and methods by means of that influence comes true on all present internal potential of enterprise, on the guided parameters of environment, taking into account the tendencies of market situation with the aim of receipt of desirable level of competitiveness.

For providing of competitiveness it is necessary complex functioning of all elements of mechanism. Absence of any link will violate a sequence and will result in the failure of functioning of management mechanism.

Cooperation of factors of management of enterprise a competitiveness is presented (fig. 1).

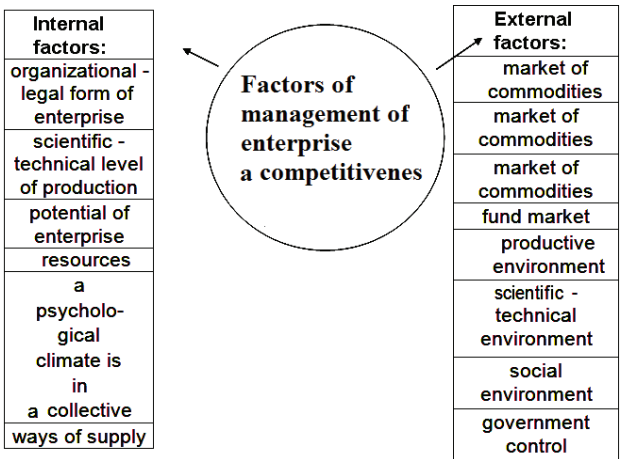


Fig. 1 – Management of enterprise a competitiveness

A management is built on principles of continuity and reliability, regularity, dynamism, collective and state interests in a management, continuous strategic management and maximal reflection of specific terms of activity of enterprise in strategy of competitiveness. Success with competitive activity becomes the function of not so much production, скільки management and depends on quality, efficiency of management and organization of production.

By development and introduction of mechanism of management a competitiveness on an enterprise must occupy the special department. Creation on the enterprise of another structural subdivision entails considerable financial expenses, the volume, taking into account terms there are today producers in that, creation is offered to on the enterprise of co-ordinating Advice on questions providing of competitiveness. His composition the leaders of all subdivisions and departments of enterprise can enter.

A mechanism of management of enterprise a competitiveness will be most more effective in that case, when he strengthens motivation of activity of people. At such mechanism co-ordination of interests of interactive parties is arrived at by the choice of methods and management resources in accordance with nature of management factors on that influence comes true. At inconsistency of interests impossible realization of effective influence is on internal and external factors and achievements of the put aim. A mechanism of management a competitiveness is the difficult category of management. He shows a soba totality of events that is sent to the achievement of the put aims.

The method of management of enterprise a competitiveness is presented from to adhere to the certain terms (table 1).

Ability of enterprise to compete at the certain commodity market directly depends on the competitiveness of commodity and successful combination of facilities of

Table 1 – Politics of management of enterprise a competitiveness

| **Development of politics of management a competitiveness is on an enterprise** | | | | |
|---|---|---|---|---|
| Use of the newest inventions | Competitive commodities that are characterized technical and economic parameters | Technical level and degree of improvement of technologies of production | Economic efficiency of the use of all resources of enterprise | Financial firmness of enterprise (coefficients of activity of enterprise and liquidity) |

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activity enterprises that give to him advantage in competitive activity. Just the same approach will allow to plan the stream of customers, shorten time on the selection of commodities.

Without regard to that the choice of strategy of competitive activity depends on the features of activity of enterprise, it is possible to distinguish the row of general tasks that stand before domestic enterprises on the modern stage: decline of prime price, differentiation of commodity, market, introduction of innovations segmentation, capacity for the instantaneous reacting on the necessities of market.

As basis approach of the systems, that is one of forms of methodological knowledge, comes forward in research of problem of management a competitiveness. Among important concepts and principles of approach of the systems distinguish integrity, connection, structure and organization, even systems and hierarchy of these levels, management, aim and expediency of behavior of the system, self-organization, functioning and development of the system.

On an enterprise it is necessary systematic to conduct diagnostics and monitoring of competition potential, that provides the receipt of state information and possible ways of the most effective use of potential in time, and also determines not only directions but also marketabilities of competition strategy.

Any control system has a right on existence at presence of aims of management and clearly certain end-point of her functioning, so as without the aims of management she becomes senseless.

Realization of aims of management and receipt of end-point is possible at presence of in the system of economic mechanism of management that is examined as means of their achievement with the minimum charges of resources. The economic mechanism of management is created for realization of certain aims and shows a soba totality of principles, methods, management facilities, and also адміністративно-правових, economic instruments, stimuli and management organs for the achievement of the put aims and receipt of desirable end-point.

Principle of orientation of production on the market state of affairs consists in that on enterprises to the problems of increase of competitiveness of products all types of productive-marketing activity must be inferior in area of level of quality, price, packing, advertisement and others like that. In this connection for the management of products a competitiveness on an enterprise there must be the worked out program of providing of necessary level of competitiveness of products with bringing in of all productive workshops, departments, services of marketing, production distribution, the organizationally-economic mechanism of management of products that provides functioning of control system by a competitiveness a competitiveness is created.

The low level of competitiveness of products determines aims and tasks realization of that will result in strengthening of control system.

Systematic character of management of products a competitiveness at all stages of cycle of product, on all levels of management, after the levels of guidance, after the functions of management a competitiveness. Realization of this principle will allow to promote scientific validity made decision and balanced them with financial and material resources. Also this principle provides close intercommunication of aims and tasks of management of products a competitiveness with necessary for their achievement facilities, methods and resources. The decision of tasks in the system must be provided with necessary resources.

Orientation on end-point – is one of major principles of management of products a competitiveness. All actions in control system by the competitiveness of products, beginning from determination of aims and tasks, must be sent to the achievement of end-point. This principle envisages the receipt of end-point at minimum charges.

Stimulation provides the use of all spectrum of stimuli moral and material for providing and increase of competitiveness of products. Stimulation of labour is basic incentive reason of increase of competitiveness of products on enterprises.

The management of products a competitiveness assumes that leaders must examine organization as totality of interdependent elements, such, as people, structure, technology, that is oriented to the achievement of different aims in the conditions of changeable environment, that binds in organic single unit aims, resources and processes that flow in organization and after her limits.

Methodology of objects as control system, including designed control system by the competitiveness of enterprise, represents the association of separate processes of management, functions of management and events in relation to providing of competitiveness of enterprise in the single system of purposeful and continuously realized administrative influences in a short-term and long-term prospect.

Methodology of objects as control system, including designed control system by the competitiveness of enterprise, represents the association of separate processes of management, functions of management and events in relation to providing of competitiveness of enterprise in the single system of purposeful and continuously realized administrative influences in a short-term and long-term prospect.

It is impossible to abandon out of eyeshot and role of the state, that must assist creation and support of terms of perfect competition. Competition positions of enterprise at the market depend on that support that an enterprise gets from the side of national public organs, from an effective and reasonable public policy.

The modern administrative going near development of models includes a design in relation to the investigated object of management:

1. Exposure of complex of rational methods and case of enterprise a competitiveness frames.
2. Clarification of розроблюваних case of enterprise a competitiveness frames.
3. Exposure of the basic requirements, that to development of model of investigated control system.

Design processes allow to investigate management objects and envisage a construction and study of models in relation to existent and designed objects of management. A design is the powerful means of scientific cognition and decision of practical tasks and widely used in science and in many areas of productive and administrative activity of enterprise.

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In Ukraine extremely unfavorable terms are for the increase of competitiveness, but offered approach management a competitiveness give an opportunity, it is better to understand how to unite scalene administrative actions in relation to providing, increase of competitiveness of enterprise in single control system, that has corresponding goals, criteria and mechanisms of functioning.

## Conclusions

Control system of events in relation to the exposure of functions, real processes of management of enterprise a competitiveness and specified requirements that is produced to the object of management of project control system in accordance with the theory of management is worked out.

For that the economy of the state functioned and provided the competitiveness, it is necessary to build the innovative system thus, to combine scientific and technical potential of regions with the complex of economic events, what called to assist rapid commercialization on internal and external markets. This way and will come forward as motive force for the achievement of success with activity of enterprises.

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# METHODICAL APPROACHES TO ASSESSING THE SOCIAL RESPONSIBILITY LEVEL

**Urusova Z.P., Lepokhin O.V.**
*Zaporizhzhia National University*
*Ukraine, 69600, Zaporizhzhia, Zhukovsk str., 66*
urusova.z.p@gmail.com
ORCID: 0000-0001-6776-9058

**Key words:**
corporate social responsibility (CSR), CSR level assessment, methodology, methodology, model, level of corporate social responsibility, Harrington's desirability function

Currently, many different methods for assessing the effectiveness of corporative social responsibility (CSR) of enterprises have been developed and applied. It should be noted that there is no single approach and a unified method for assessing CSR. However, further attempts are being made to find new methods and approaches that would assess the company's social responsibility within the adopted valuation system, and improve existing ones. The article is devoted to the development of scientific and practical recommendations for determining the assessment of the level of social responsibility. An algorithm for calculating the level of corporate social responsibility of enterprises has been proposed. After analyzing the existing methods for determining the level of corporate social responsibility, it has been proved that there are no ideal modern methodological approaches to measuring the effectiveness of CSR, since the importance of certain areas of CSR is still the subject of scientific discussion. Some of the methods of assessing CSR are to match the results obtained with the established standards. Other methods are based on the addition of the characteristics obtained through the use of standard assessments, which also describe the effectiveness of CSR through the prism of its impact on stakeholders, but which are not always measured in quantitative indicators. The peculiarity of assessing the effectiveness of social responsibility relations is the low level of manufacturability of management in this area. The development of an assessment of the effectiveness of social technologies, despite all their diversity and diversity of social investments, lags far behind the requests of practice. Assessment of corporate social responsibility should be considered as a process of evaluation as well as quantitative or qualitative expression of the state of socially responsible activity of the company. The Harrington's desirability function is proposed for building a generalized indicator of corporate social responsibility of enterprises.

# МЕТОДИЧНІ ПІДХОДИ ДО ОЦІНКИ РІВНЯ СОЦІАЛЬНОЇ ВІДПОВІДАЛЬНОСТІ

**Урусова З.П., Лепьохін О.В.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
корпоративна соціальна відповідальність (КСВ),оцінка рівня КСВ, методика,методологія, модель,рівень корпоративної соціальної відповідальності, функція бажаності Харрінгтона

В даний час розроблено і застосовується безліч різних методик оцінки рівня ефективності +корпоративної соціальної відповідальності (КСВ) компаній. В даний час не існує єдиного підходу і єдиної методики оцінки КСВ, проте, здійснюються подальші спроби пошуку нових методів і підходів, які дозволили б оцінити соціальну відповідальність компанії в рамках прийнятої оціночної системи, і вдосконалити вже існуючі. Статтю присвячено розробці науково-практичних рекомендацій щодо визначення оцінки рівня соціальної відповідальності та запропоновано алгоритм розрахунку рівня корпоративної соціальної відповідальності підприємств. В результаті аналізу існуючих методів визначення рівня корпоративної соціальної відповідальності, доведено, що ідеальних сучасних методологічних підходів до вимірювання ефективності КСВ немає, оскільки важливість окремих напрямків КСВ все ще є предметом наукової дискусії. Деякі з методик оцінки КСВ полягають в зіставленні отриманих результатів з встановленими стандартами. Інші методики ґрунтуються на доповненні отриманих за допомогою застосування стандартних оцінок характеристик, які також описують результативність КСВ через призму її впливу на стейкхолдерів, але які при цьому не завжди

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вимірюються в кількісних показниках. Особливістю оцінки ефективності відносин соціальної відповідальності є низький рівень технологічності управління в даній сфері. Розробка оцінки ефективності соціальних технологій, незважаючи на всі їх різноманіття і різноманіття соціальних інвестицій, значно відстає від запитів практики. Оцінку корпоративної соціальної відповідальності потрібно розглядати як процес оцінювання та кількісне або якісне вираження стану соціально відповідальної діяльності компанії. В статті запропоновано використовувати для побудови узагальненого показника корпоративної соціальної відповідальності підприємств функцію бажаності Харрінгтона.

**Analysis of recent researches and publications**

The works of foreign scientists such as: W. Fredenburg, D. Emerson, K. Clark, B. Ruf, K. Muralidhar, K. Paul and other authors are devoted to the issues of social efficiency, social effectiveness, social impact of investments. An interesting approach to evaluating the effectiveness and measuring the socially responsible activities of companies is the methodology has been proposed by Ruf, Muralidhar and Paul. This approach is based on the distribution of the significance of CSR indicators and meets the basic requirements for CSR measurement tools. The methodology provides a reflection of various parameters of social responsibility of business, and does not depend on the characteristics of the company; it's based on measuring not perceptions and ideas but the socially oriented activities results, and reflects the values of the stakeholder groups chosen for analysis [1, p. 119–133].

The methodology of S. Waddock and S. Graves uses KLD Index (Kinder, Lydenberg, and Domini), which is one of the most used indexes. All fixed indicators inside the directions are assigned equal significance (weight of the indicator), and weight (significance) of all negative indicators are deducted from the amount of weights of positive indicators. As a result, the company's social responsibility index is calculated. It could be showed that companies effectively implementing corporative social responsibility can be ineffective in terms of other ratings [2, p. 303–319].

Foreign scientists Krychevsky N.A. and Goncharov S.F. [3, p. 130–148] offer a system for assessing the level of enterprises corporate social responsibility on the basis of quantitative and qualitative indicators. Quantitative indicators include social responsibility indicators to employees, social responsibility indicators to society (community) and indicators of environmental responsibility. The authors attributed to the qualitative indicators: a presence or absence of a valid collective agreement at the enterprise; a presence or absence of a separate structure responsible for the implementation of social responsibility measures; the existing practice of social reports compiling, etc.

Domestic scientists also pay a lot of attention to determining the level of corporate social responsibility. For example, Hrytsina L.A. proposes to apply a normative and indicative approach to the assessment of corporate social responsibility [4, p. 9–10].

Berezina O.Y. [5, p. 98–100] proposes a methodology for determining the rating of social responsibility of the corporation in the field of labor relations on the basis of quantitative assessment of CSR, which allows to compare incomparable partial indicators (by units of measurement).

**The purpose of the article**

The purpose of the article is the analysis of methods for assessing corporate social responsibility and assessment of corporate social responsibility of enterprises of the Zaporozhzhia region using the Harrington desirability function.

**Presentation of the main material**

As a result of the review and analysis of existing methods of enterprise corporate social responsibility level estimation the methods that can be used were revealed:

- method of enterprise corporate social responsibility level integral estimation;
- rating of corporate social responsibility level of enterprises, branches, regions and entities;
- matrix modelling of enterprise corporate social responsibility level estimation.

At the same time, when analyzing the main advantages and disadvantages of these methods, it was found that the best method for our research is to use a combined method of integrated assessment of enterprises corporate social responsibility level.

The use of this method and the design of enterprises corporate social responsibility model uses financial reporting indicators, inputs: staff working hours using as percentage of working time fund (*x1*), unemployment level, % (*x2*), employment level, % (*x3*), average monthly wage per employee, UAH (*x4*), *wage arrears* as percentage of average annual payroll (*x5*), part of workers who have not been paid their wages on time as percentage of average number (*x6*), number of workers employed in conditions that do not correspond to hygienic conditions (as percentage of average staff number) (*x7*), number of work-related injuries per 1000 employeers (*x8*), number of workers who have learned new occupations (as percentage of average staff number) (*x9*), staff turnover (as percentage of average staff number) (*x10*), number of employees covered by collective agreements, % (*x11*), level of fulfilment of collective bargaining obligations, % (*x12*), level of fulfilment of collective wage obligations, % (*x13*), level of compliance with labour protection obligations under collective agreements, % (*x14).*

Based on these indicators the integral estimation of enterprise corporate social responsibility level based on expert peer rewiews has been performed.

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For analysis the activities of enterprises Dniprospetsstal, ZTMK, ZTZ, Zaporishkoks for the length of 2015–2017 years were reviewed.

Formation of main requirements to corporate social responsibility model is one of the first stages of researches. For this model to be usable for further analysis of corporate social responsibility level, it must correspond to its attributes.

The main corporate social responsibility level estimation model requirements are:

• it should reflect common features of review of enterprises corporate social responsibility;
• be adequate and produce results close to reality;
• use of the model for management decision-making;
• enable the comparison of several enterprises;
• enable identification of the most responsible objects.

In addition, the model should be implemented in a preferably accessible software environment and, if input data are changed, it should generate a correct response to the task.

However, having a large number of output indicators makes corporate social responsibility analysis difficult, cumbersome, less informative and has a negative impact on weights. To address this problem, it was suggested that a consecutive matching mechanism be used, with inputs grouped into four core groupings. A summary indicator is defined for each group, which contains a number of calculated outputs. Based on research, corporate social responsibility indicators groups were allocated:

• indicators of production development and employment efficiency ($\kappa 1$) – indicators *x1 – x3*;
• indicators of timeliness and pay ($\kappa 2$) – indicators *x4 – x6*;
• indicators on working conditions and social protection ($\kappa 3$) – indicators *x7 – x10*;
• indicators that describe the extent and level of collective bargaining ($\kappa 4$) – indicators *x11 – x14*;

After each indicator is determined, taking into account their weights, the integrative corporate social responsibility indicator is determined. A description of the model domain space is presented in the Tab. 1.

One of the most convenient ways of constructing a generic corporate social responsibility indicator is the Harrington desirability function. The general function is based on the idea of converting the natural values of the individual indicators into an unambiguous scale of desirability. The generalized desirability function is the geometric mean of the individual optimization parameters:

$$D = \sqrt[m]{\prod_{i=1}^{m} d_i}, \quad (1)$$

where $D$ – generalized desirability function (generalized corporate social responsibility indicator); $m = 4$ – sets of factors number (see. tab. 1); $d_i$ – partial desirability

$$d_i = \exp(-\exp(-G_i)), \quad (2)$$

where $G_i$ – group-based integrative indicator of $i$-th group.

As a result, the description of the model structure (Fig. 1), in which the weights of inputs are calculated according to the Fischburn rule has been built:

$$w_j = \frac{2\left(n - N_j + 1\right)}{n\left(n+1\right)}, \quad j = \overline{1, n}, \quad (3)$$

where $w_j$ – weight of $j$-th indicator; $N_j$ – range of $j$-th indicator (table 1 shows ranked figures); $n$ – total amount of indicators.

Normalized values of $j$-th indicators are calculated by formula:

$$\tilde{x}_j = \frac{x_j - x_j^{\min}}{x_j^{\max} - x_j^{\min}}, \quad j = \overline{1, n},$$

where $x_j^{\max}$, $x_j^{\min}$ – the maximum and minimum value of all similar enterprise inputs.

Based on the model structure, an algorithm for calculating the level of corporate social responsibility of enterprises has been developed and is shown in the fig. 2.

The model interface is implemented with the program MS Excel.

The model provides the following results:

• identification of indicators for measuring corporate social responsibility;
• establishing standard indicators for measuring corporate social responsibility;

Table 1 – Forming the feature space of the corporate social responsibility level estimation model

| Indicator | Weights | Dniprospetsstal | | | ZTMK | | | ZTZ | | | Zaporishkoks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 |
| *x1* | 0,5 | 86,4 | 88,2 | 86,8 | 79,3 | 80,5 | 81,5 | 86,6 | 85,3 | 86,3 | 87,2 | 85,5 | 86,4 |
| *x2* | 0,33 | 7,2 | 7,9 | 8,5 | 13,8 | 14,1 | 14,6 | 9,7 | 10,0 | 10,7 | 7,1 | 6,4 | 6,1 |
| *x3* | 0,17 | 60,9 | 59,1 | 58,0 | 50,3 | 50,0 | 49,4 | 56,4 | 56,0 | 55,2 | 59,3 | 59,7 | 60,6 |
| *x4* | 0,5 | 4,4 | 5,1 | 6,9 | 5,0 | 6,0 | 7,8 | 4,2 | 5,1 | 6,9 | 3,7 | 4,5 | 6,3 |
| *x5* | 0,33 | 3,0 | 3,0 | 1,9 | 7,9 | 11,4 | 12,3 | 3,0 | 4,1 | 1,0 | 7,2 | 5,3 | 0,8 |
| *x6* | 0,17 | 1,6 | 1,0 | 0,3 | 12,3 | 4,8 | 12,1 | 1,0 | 2,1 | 1,0 | 0,8 | 1,7 | 0,6 |
| *x7* | 0,4 | 40,8 | 41,6 | 42,1 | 43,9 | 51,2 | 47,1 | 35,0 | 37,6 | 36,8 | 22,5 | 23,0 | 24,0 |
| *x8* | 0,3 | 0,6 | 0,7 | 0,4 | 0,6 | 0,5 | 0,7 | 0,6 | 0,7 | 0,5 | 0,7 | 0,5 | 0,6 |
| *x9* | 0,2 | 3,0 | 2,9 | 2,6 | 3,6 | 3,2 | 1,1 | 2,8 | 2,3 | 2,2 | 1,7 | 1,6 | 1,5 |
| *x10* | 0,1 | 26,2 | 25,8 | 28,6 | 24,0 | 17,8 | 21,0 | 21,5 | 23,4 | 25,1 | 27,6 | 24,2 | 26,9 |
| *x11* | 0,4 | 78,2 | 81,8 | 75,1 | 84,6 | 85,7 | 84,0 | 85,0 | 81,5 | 82,7 | 82,2 | 84,1 | 84,4 |
| *x12* | 0,3 | 87,2 | 93,6 | 89,9 | 95,0 | 93,5 | 94,0 | 81,6 | 85,8 | 84,7 | 98,1 | 83,4 | 86,2 |
| *x13* | 0,2 | 88,1 | 98,0 | 99,9 | 83,1 | 85,9 | 84,7 | 84,7 | 98,8 | 96,4 | 90,7 | 97,1 | 90,9 |
| *x14* | 0,1 | 89,4 | 99,3 | 87,7 | 85,1 | 86,9 | 99,1 | 82,6 | 88,0 | 96,9 | 88,3 | 80,0 | 84,1 |

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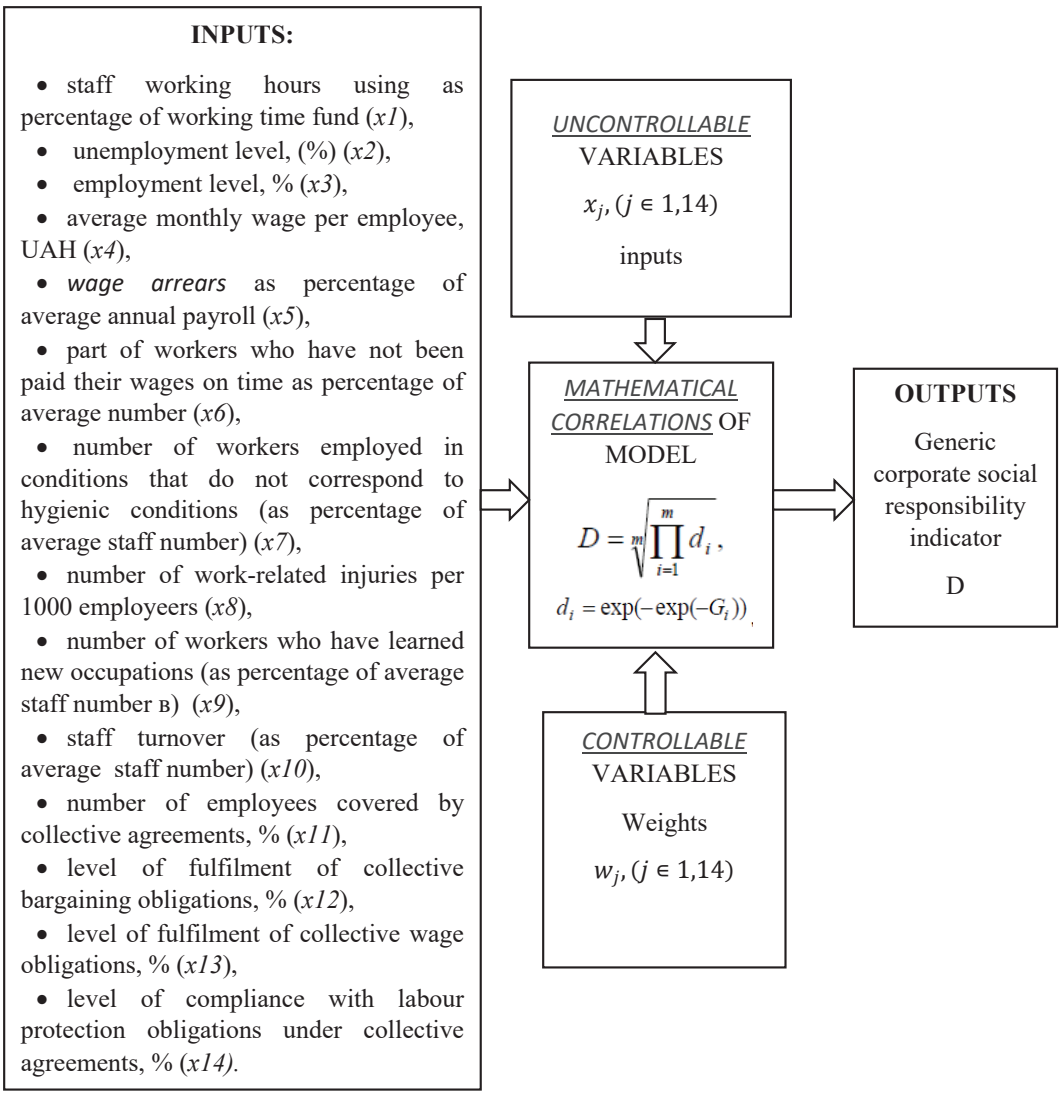


Fig. 1 – Description of the model structure

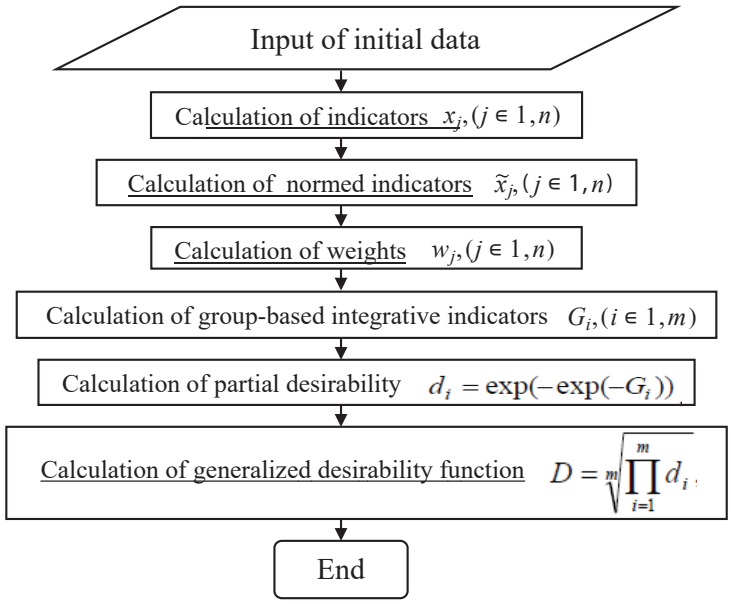


Fig. 2 – Corporate social responsibility ratio calculation algorithm

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• identification of integrated indicators to measure corporate social responsibility;

• using Fischburn rule for weight indicators estimation;

• using general desirability function Hurrington for rating creation.

The obtained model then produced such results:

• a table construction with the input data of a number of Ukrainian enterprises, which will be used for further analysis;

• a table calculation with modelled indicators for each research subject;

• calculation of the standard values of the level of corporate social responsibility;

• calculation of the Fishburn Rule weights was carried out to proceed to the calculation of the group summaries by an additive matching;

• integrated indicator calculation using Harrington desirability function, that allows the numerical quality of the object to match the verbal value of desirability.

Calculations are shown in the following tables 2–4.

Enterprises with low corporate social responsibility, must show a negative result at the end of the calculation, namely – on the Harrington desirable scale, the function interval shall be between 0 and 0,37. A diagram showing the level of corporate social responsibility of enterprises was constructed on the basis of research data (Fig. 3).

Analysing the results of calculations and studies on the basis of the built model for the evaluation of integrated indicators of corporate social responsibility of Zaporizhzhia enterprises it can be concluded that under the Harrington Universal Scale, the enterprises reviewed provide an adequate level of corporate social responsibility.

Conclusions. After analyzing the existing methods for determining the level of corporate social responsibility, one can see that there is no ideal methodological approach the CSR effectiveness measuring, since the significance of certain areas of CSR is still the subject of scientific discussion. The results of statistical analysis of the application of the Data Envelopment Analysis (DEA) methodology and methods based on the distribution of the indicators significance (the method of equal significance, the method of Ruff, Muralidhar and Paul, the Waddock and Graves technique using KLD data), show that companies effectively implement CSR in accordance with DEA can be ineffective in terms of other ratings.

Table 2 – Weighted scores

| Indicator | Dniprospetsstal | | | ZTMK | | | ZTZ | | | Zaporishkoks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 |
| *x1* | 43,2 | 44,1 | 43,4 | 39,65 | 40,25 | 40,75 | 43,3 | 42,65 | 43,15 | 43,6 | 42,75 | 43,2 |
| *x2* | 3,6 | 3,95 | 4,25 | 6,9 | 7,05 | 7,3 | 4,85 | 5 | 5,35 | 3,55 | 3,2 | 3,05 |
| *x3* | 30,4 | 29,55 | 29 | 25,15 | 25 | 24,7 | 28,2 | 28 | 27,6 | 29,65 | 29,85 | 30,3 |
| *x4* | 2,2 | 2,55 | 3,45 | 2,5 | 3 | 3,9 | 2,1 | 2,55 | 3,45 | 1,85 | 2,25 | 3,15 |
| *x5* | 1,5 | 1,5 | 0,95 | 3,95 | 5,7 | 6,15 | 1,5 | 2,05 | 0,5 | 3,6 | 2,65 | 0,4 |
| *x6* | 0,8 | 0,5 | 0,15 | 6,15 | 2,4 | 6,05 | 0,5 | 1,05 | 0,5 | 0,4 | 0,85 | 0,3 |
| *x7* | 20,4 | 20,8 | 21,05 | 21,95 | 25,6 | 23,55 | 17,5 | 18,8 | 18,4 | 11,25 | 11,5 | 12 |
| *x8* | 0,3 | 0,35 | 0,2 | 0,3 | 0,25 | 0,35 | 0,3 | 0,35 | 0,25 | 0,35 | 0,25 | 0,3 |
| *x9* | 1,5 | 1,45 | 1,3 | 1,8 | 1,6 | 0,55 | 1,4 | 1,15 | 1,1 | 0,85 | 0,8 | 0,75 |
| *x10* | 13,1 | 12,9 | 14,3 | 12 | 8,9 | 10,5 | 10,75 | 11,7 | 12,55 | 13,8 | 12,1 | 13,4 |
| *x11* | 39,1 | 40,9 | 37,55 | 42,3 | 42,85 | 42 | 42,5 | 40,75 | 41,35 | 41,1 | 42,05 | 42,2 |
| *x12* | 43,6 | 46,8 | 44,95 | 47,5 | 46,75 | 47 | 40,8 | 42,9 | 42,35 | 49,05 | 41,7 | 43,1 |
| *x13* | 44,05 | 49 | 49,95 | 41,6 | 42,95 | 42,35 | 42,35 | 49,4 | 48,2 | 45,35 | 48,55 | 45,5 |
| *x14* | 44,7 | 49,65 | 43,85 | 42,55 | 43,45 | 49,55 | 41,3 | 44 | 48,45 | 44,15 | 40 | 42,1 |

Table 3 – The results of the sequential matching procedure

| Indicator | Dniprospetsstal | | | ZTMK | | | ZTZ | | | Zaporishkoks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 |
| K1 | 77,25 | 77,6 | 76,7 | 71,7 | 72,3 | 72,75 | 76,35 | 75,65 | 76,1 | 76,8 | 75,8 | 76,55 |
| K2 | 4,5 | 4,55 | 4,55 | 12,6 | 11,1 | 16,1 | 4,1 | 5,65 | 4,45 | 5,85 | 5,75 | 3,85 |
| K3 | 35,3 | 35,5 | 36,85 | 36,05 | 36,35 | 34,95 | 29,95 | 32 | 32,3 | 26,25 | 24,65 | 26,5 |
| K4 | 171,5 | 186,4 | 176,3 | 173,9 | 176 | 180,9 | 167,0 | 177,1 | 180,35 | 179,65 | 172,3 | 172,8 |

Table 4 – Calculation of desirability function

| Indicator | Dniprospetsstal | | | ZTMK | | | ZTZ | | | Zaporishkoks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 | 15 | 16 | 17 |
| Normalized values | | | | | | | | | | | | |
| K1 | 0,63 | 1,00 | 0,00 | 0,00 | 0,57 | 1,00 | 1,00 | 0,00 | 0,64 | 1,00 | 0,00 | 0,75 |
| K2 | 0,00 | 1,00 | 1,00 | 0,30 | 0,00 | 1,00 | 0,00 | 1,00 | 0,23 | 1,00 | 0,95 | 0,00 |
| K3 | 0,00 | 0,13 | 1,00 | 0,79 | 1,00 | 0,00 | 0,00 | 0,87 | 1,00 | 0,86 | 0,00 | 1,00 |
| K4 | 0,00 | 1,00 | 0,33 | 0,00 | 0,30 | 1,00 | 0,00 | 0,75 | 1,00 | 1,00 | 0,00 | 0,07 |
| Desirability function | | | | | | | | | | | | |
| | 0,41 | 0,61 | 0,54 | 0,45 | 0,51 | 0,59 | 0,43 | 0,57 | 0,60 | 0,68 | 0,43 | 0,50 |

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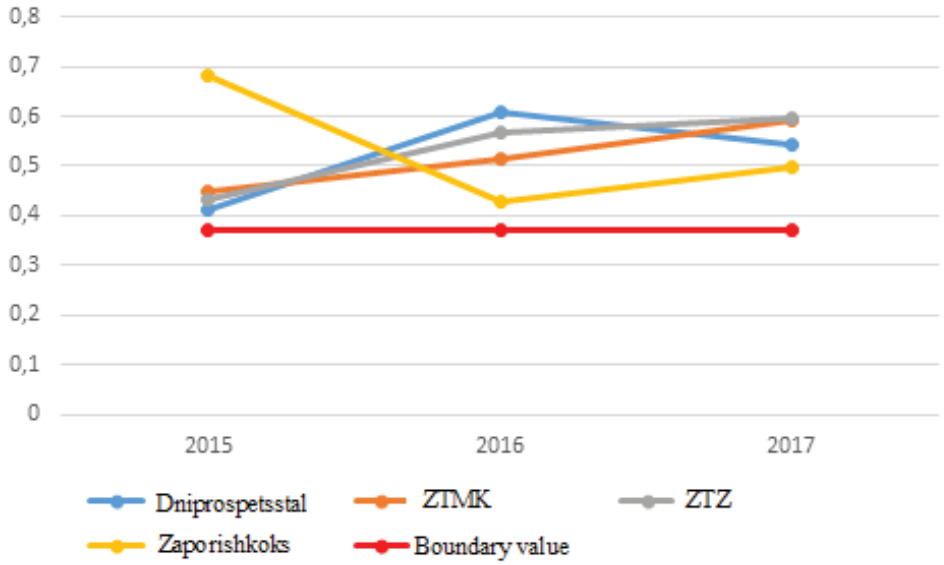


Fig. 3 – Desirability function of corporate social responsibility

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# JUSTIFICATION OF EXPENDITURE OF INNOVATIVE DEVELOPMENT OF ENTERPRISES

**Cherep A.V., Moroz N.A.**
*Zaporizhzhia National University*
*Ukraine, 69600, Zaporizhzhia, st. Zhukovsky, 66*

**Key words:**
innovations, innovation activity, factors, financing, state budget, industry, tendencies, efficiency, enterprises

The article examines the dynamics of innovation performance of industrial enterprises. The dynamics of volumes of financing of innovative activity of industrial enterprises of Ukraine were analyzed in this article. Also the analysis of indicators of financial maintenance of innovative activity of industrial enterprises of Ukraine and Zaporozhye area was carried out. The analysis of innovative activity of industrial enterprises by types of the carried out innovations was executed. Research has shown that despite the recognition of the role of innovation in the economic development of the state, the current state of economic incentives as a factor in the innovation of enterprises in Ukraine indicates insufficient conditions for the realization of innovation potential. It was established that the volume of costs of Ukrainian enterprises can be divided into internal and external research. It is noted that the costs of research and development have a gradually increasing trend, which means that Ukrainian companies spend more money each year on research, theoretical and experimental work to identify hidden opportunities for innovative products and technologies, as well as work that related to the development of design and technological documentation. The necessity of development of innovative activity of enterprises is substantiated and it is proved that expenses for innovative processes are a means of development of industrial enterprises. Obstacles hindering the innovative activity of industrial enterprises were also identified and measures to eliminate them were proposed.

# ОБҐРУНТУВАННЯ ДОЦІЛЬНОСТІ ІННОВАЦІЙНОГО РОЗВИТКУ ПІДПРИЄМСТВ

**Череп А.В., Мороз Н.О.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
інновації, інноваційна активність, фактори, фінансування, державний бюджет, промисловість, тенденції, ефективність, підприємства

У статті досліджено динаміку показників інноваційної активності промислових підприємств. Проаналізовано динаміку обсягів фінансування інноваційної діяльності промислових підприємств в Україні, а також проведено аналіз показників фінансового забезпечення інноваційної діяльності промислових підприємств України та Запорізької області. Виконано аналіз інноваційної діяльності промислових підприємств за видами проведених інновацій. Дослідження показали, що незважаючи на визнання ролі інновацій для економічного розвитку держави, сучасний стан економічного стимулювання як чинника інноваційної діяльності підприємств в Україні свідчить про недостатні умови для реалізації інноваційного потенціалу. Встановлено, що обсяг витрат підприємств України можна поділити на внутрішні та зовнішні НДР. Зазначено, що витрати на дослідження та розробки мають поступово зростаючу тенденцію, що означає, що підприємства України з кожним роком витрачають більшу суму грошей на виконання пошукових, теоретичних та експериментальних робіт для виявлення прихованих можливостей створення інноваційних продуктів та технологій, а також на роботи, які пов'язані з розробкою конструкторської та технологічної документації. Обґрунтовано необхідність розвитку інноваційної активності підприємств та доведено, що витрати на інноваційні процеси є засобом розвитку промислових підприємств. Також виявлено перешкоди, що стримують інноваційну активність промислових підприємств і запропоновані заходи щодо їх усунення.

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**Analysis of recent research and publications**

A significant contribution to the study of innovation of enterprises was made by domestic scientists: Baranovska S.P. [1], Boychuk N.Ya. [2], Buzhimska K.O. [3], Varnaliy S.S. [4], Haman M.V. [6], Geets V.I. [5], Datsy O.I. [6], Datsy N.V. [6], Kuzmin O.E. [7], Silantiev S.O. [8], Fedulova L.I. [9] and others. However, given the further integration of Ukraine into the European space and the new challenges posed by modern globalization processes, many aspects of this issue remain obscure and need to be addressed.

**Formulation of the goals of the article**

The aim of the article is to study the dynamics of innovation activity of industrial enterprises of Ukraine in modern economic conditions in the context of determining proposals for improving their innovative development.

**Presentation of the main material of the study**

An important factor in creating conditions for the rapid growth of the national economy, overcoming the socio – economic crisis and increasing competitiveness on the world stage is the active innovation of enterprises. The experience of developed countries shows that industrial enterprises that effectively use new knowledge and achievements are able to increase production and sales, reduce costs, to increase labor productivity, achieve technological independence and increase the efficiency of their activities. According to experts, scientific and technological progress as a source of economic growth in the near future will provide up to 90% of the real increase in production (today it is 65–70%) [10, p. 89].

The main indicators of innovation activity are the share of enterprises that have implemented innovations and the share of sold innovative products in the volume of industrial.

From fig. 1 shows that the minimum share of enterprises that implemented innovations took place in 2012 and amounted to 12.1%, and the maximum – in 2016 and amounted to 16.6%. The share of sold innovative products in the volume of industrial products is characterized by the lowest rate in 2017 (0.7%) and the highest – in 2014 (2.5%). Thus, there is a high discrepancy between the implemented innovations and sold products in the industry. This suggests that the lack of financial resources forces companies to reorient from the production of innovative products to the introduction of technological, resource-saving processes that can optimize their costs.

Despite the recognition of the role of innovation for the economic development of the state, the current state of economic incentives as a factor in the innovative activity of enterprises in Ukraine indicates insufficient conditions for the realization of innovation potential. Let us analyze the dynamics of funding for innovation activities of industrial enterprises (Table 1).

Analysis of sources of financing of innovative activity of enterprises of Ukraine for 2005–2020 indicates that the costs of innovation are covered by the own funds of enterprises. The share of which in 2020 is up to 85.4% of total spending on innovation. A negative trend is the decrease in funding for innovation by foreign investors.

Their share in total expenditures on innovation in Ukraine decreased from 2.7% to 0.9% in 2020.

Funding for innovation from the state budget for the presented period was carried out only at the level of up to 5%, and in some years were much lower than this level, which indicates limited opportunities for state support for innovation. It is unfortunate that with the start of the war in eastern Ukraine, foreign investors have virtually stopped investing in the innovative activities of domestic enterprises. During 2014–2018, the share of foreign investment in Ukrainian innovation did not exceed 2%.

According to the State Statistics Service of Ukraine presented in table 2 we see that in 2018 the largest number of industrial enterprises introduced new machines, equipment and software, and the least common type of innovation is conducting external research and acquisition of other external knowledge. Expenditures in 2018

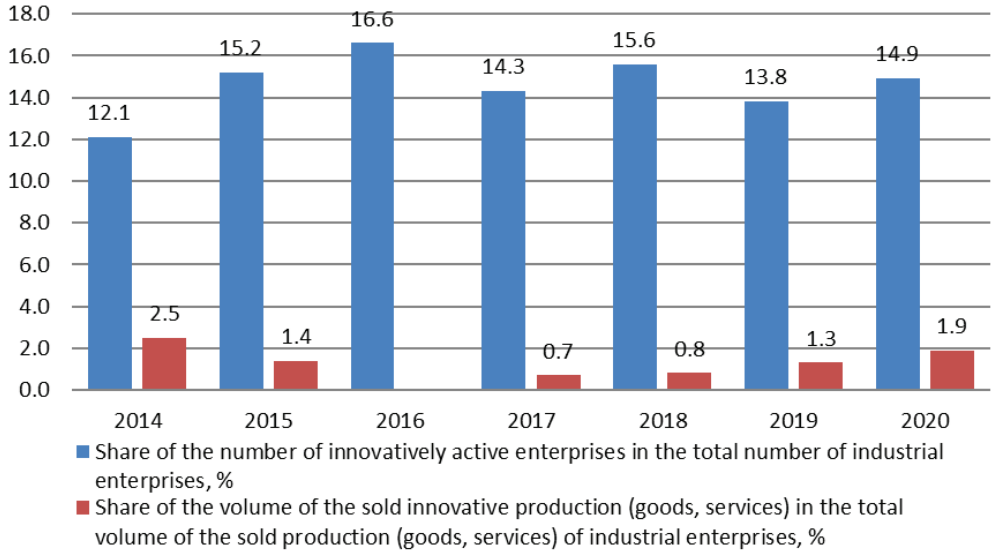


Fig. 1 – Innovative activity of industrial enterprises during 2014–2020

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Table 1 – Dynamics of volumes of financing of innovative activity in Ukraine in 2005–2020

| Years | Total amount of financing (UAH million) | Including by sources | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Own funds | | National budget | | Foreign investors | | Other sources | |
| | | UAH million | % | UAH million | % | UAH million | % | UAH million | % |
| 2005 | 5751,6 | 5045,4 | 7,7 | 28,1 | 0,5 | 157,9 | 2,7 | 520,2 | 9,0 |
| 2006 | 6160,0 | 5211,4 | 4,6 | 114,4 | 1,9 | 176,2 | 2,9 | 658,0 | 0,7 |
| 2007 | 10821,0 | 7969,7 | 3,7 | 144,8 | 1,3 | 321,8 | 3,0 | 2384,7 | 2,0 |
| 2008 | 11994,2 | 7264,0 | 0,6 | 336,9 | 2,8 | 115,4 | 1,0 | 4277,9 | 5,7 |
| 2009 | 7949,9 | 5169,4 | 5,0 | 127,0 | 1,6 | 1512,9 | 9,0 | 1140,6 | 4,3 |
| 2010 | 8045,5 | 4775,2 | 9,4 | 87,0 | 1,1 | 2411,4 | 0,0 | 771,9 | 9,6 |
| 2011 | 14333,9 | 7585,6 | 2,9 | 149,2 | 0,0 | 56,9 | 0,4 | 6542,2 | 5,6 |
| 2012 | 11480,6 | 7335,9 | 3,9 | 224,3 | 2,0 | 994,8 | 8,7 | 2925,6 | 5,5 |
| 2013 | 9562,6 | 6973,4 | 2,9 | 24,7 | 0,3 | 1253,2 | 3,1 | 1311,3 | 3,7 |
| 2014 | 7695,9 | 6540,3 | 5,0 | 344,1 | 4,5 | 138,7 | 1,8 | 672,8 | 8,7 |
| 2015 | 13813,7 | 13427,0 | 7,2 | 55,1 | 0,4 | 58,6 | 0,4 | 273,0 | 2,0 |
| 2016 | 23229,5 | 22036,0 | 4,9 | 179,0 | 0,8 | 23,4 | 0,1 | 991,1 | 4,3 |
| 2017 | 9117,5 | 7704,1 | 4,5 | 227,3 | 2,5 | 107,8 | 1,2 | 1078,3 | 1,8 |
| 2018 | 12180,1 | 10742,0 | 8,2 | 639,1 | 5,2 | 107,0 | 0,9 | 692,0 | 5,7 |
| 2019 | 14220,9 | 12474,9 | 7,7 | 556,5 | 3,9 | 42,5 | 0,3 | 1147,0 | 8,1 |
| 2020 | 14406,7 | 12297,7 | 5,4 | 279,5 | 1,9 | 125,3 | 0,9 | 1704,2 | 1,8 |

Source: calculated according to the Main Department of Statistics in Ukraine [11]

Table 2 – Innovative activity of industrial enterprises by types of innovations for 2012–2018

| Indexes | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|
| Share of the number of innovatively active enterprises in the total number of industrial enterprises, % | 17,4 | 16,8 | 16,1 | 17,3 | 18,9 | 16,2 | 16,4 |
| Innovation expenditure, million UAH | 11480,6 | 9562,6 | 7695,9 | 13813,7 | 23229,5 | 9117,5 | 12180,1 |
| Research and development (R&D) million UAH | 1196,3 | 1638,5 | 1754,6 | 2039,5 | 2457,8 | 2169,8 | 3208,8 |
| Internal (R&D), million UAH | 965,2 | 1312,1 | 1221,5 | 1834,1 | 2063,8 | 1941,3 | 2706,2 |
| External (R&D), million UAH | 231,1 | 326,4 | 533,1 | 205,4 | 394 | 228,5 | 502,6 |
| Acquisition of other external funds, million UAH | 47 | 87 | 47 | 84 | 64 | 21 | 46 |
| Purchase of machinery, equipment and software, million UAH | 8051,8 | 5546,3 | 5115,3 | 11141,3 | 19829 | 5898,8 | 8291,3 |
| Other expenses, million UAH | 2185,5 | 2290,9 | 778,8 | 548 | 878,4 | 1027,1 | 633,9 |

Source: calculated according to the Main Department of Statistics in Ukraine [11]

for the acquisition of external knowledge amounted to UAH 502.6 million, and expenditures for the purchase of machinery, equipment and software amounted to UAH 8,291.3 million.

It should also be noted that research and development costs are gradually increasing. This means that Ukrainian companies spend more money every year on research, theoretical and experimental work to identify hidden opportunities for innovative products and technologies, as well as work related to the development of design and technological documentation. The corresponding cost item is divided into internal and external R&D.

Figure 2 shows that Ukrainian enterprises prefer innovative activities in domestic production, rather than the purchase of ready-made equipment, technologies and ideas in foreign markets.

The main problems that determine the current state of innovation in industrial enterprises of Ukraine are [12]:

1) inconsistency of legislation in the field of innovation, inconsistency of the norms of bylaws with the progressive norms of current laws, which does not ensure the practical implementation of the latter;

2) inconsistency of state actions to support the subjects of innovation;

3) a significant reduction in innovation activity of enterprises and the general deterioration of the innovation culture of society;

4) inefficiency of mechanisms of legal protection of intellectual property;

5) lack of a proper system for forecasting scientific, technological and innovative development;

6) dissemination of the practice of ignoring current norms during the adoption of laws on the state budget for the current or next years.

While investigating the innovative activity of industrial enterprises of Zaporozhye region, it is advisable to analyze their activity in the field of implementation of various innovations (Table 3).

Thus, the majority of the total expenditure on technological innovations falls on the purchase of machinery, equipment and software in 2019, the figure was – 514444.8 thousand UAH. Instead, the acquisition of other external knowledge will cost at least in 2019 only 99 thousand UAH (Table 3).

## Conclusions

The results of the study show that the main source of funding for innovation of domestic enterprises are their

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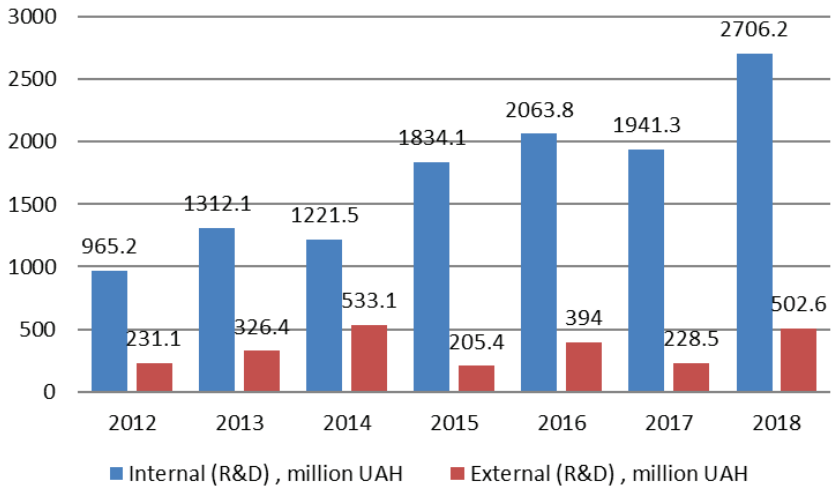


Fig. 2 – The amount of costs of Ukrainian enterprises for internal and external research

Table 3 – Innovative activity of industrial enterprises of Zaporozhye region

| Indexes | 2011 | 2012 | 2013 | 2014 | 2015 | 2017 | 2019 |
|---|---|---|---|---|---|---|---|
| Share of the number of innovatively active enterprises in the total number of industrial enterprises, % | 27,6 | 29,8 | 28,8 | 22,9 | 20,9 | 19,1 | 19,3 |
| Innovation expenditure, thousand UAH | 800427,2 | 242990,6 | 298671,5 | 339943,9 | 321051,3 | 1393360,2 | 681707,2 |
| Research and development (R&D), thousand UAH | 77024,6 | 66016,7 | 140190,1 | 111248,8 | 123797,2 | 252003,3 | 136254,5 |
| Internal (R&D), thousand UAH | 55376 | 49274,3 | 21158,4 | 33771,3 | 61744,9 | 138579,4 | 92861,2 |
| External (R&D), thousand UAH | 21648,6 | 16742,4 | 119031,7 | 77477,5 | 62052,3 | 113423,9 | 43393,3 |
| Acquisition of other external funds, thousand UAH | 252330 | 283,9 | 393,1 | 515,2 | 359,2 | 531,4 | 99 |
| Purchase of machinery, equipment and software, thousand UAH | 4179874 | 107914,5 | 129235,9 | 197073,7 | 94659 | 915464,4 | 514444,8 |
| Other expenses, thousand UAH | 53085,2 | 68775,5 | 28852,4 | 31106,2 | 102235,9 | 225361,1 | 30908,9 |

Source: calculated according to the Main Department of Statistics in the Zaporizhia region [13]

own funds. Increasing the share of state participation in financing the innovative activities of Ukrainian enterprises remains an important issue. To intensify innovation in Ukraine, a new comprehensive mechanism is needed to stimulate the entire innovation process – from basic research to the implementation of developments in production. In order to activate production, scientific and innovative potential it is necessary to:

– improve the tools of legal regulation of innovation, especially in the field of protection of intellectual property rights;

– increase the volume of investments in scientific and innovative activities primarily by the state;

– increase the national security of the country;

– attract foreign investors;

– create of innovation infrastructure at the national and regional levels, which would ensure the effective use of scientific and technical potential, increase the level of innovation and competitiveness of enterprises (business incubators, technology parks, technology transfer centers);

– develop and strengthen financial and credit institutions that ensure continuity of financing of innovative projects (venture companies, innovation funds);

– train highly qualified workers and their involvement in active industries to create new technologies;

– intensifyinternational scientific and scientific-technical cooperation.

There is no close correlation between the volume of investment in innovation activities and the results of innovation activity of industrial enterprises. It is not necessary to count on the rapid effect of investments in innovation under the current conditions in Ukraine. Therefore, the state and legal entities should focus on long-term progressive results.

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# NATIONAL ECONOMY'S MARKET MECHANISMS OF ACCOUNTING, ANALYSIS AND AUDIT

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## ANALYSIS OF PROBLEM ASPECTS OF INTERNET TRADING IN THE SPHERE OF EMPLOYMENT IN UKRAINE

**Proskurina N.M., Koneva A.V.**
*Zaporizhzhya national university*
*Ukraine, 69000, Zaporizhzhya, Zhukovsky str., 66*
profauditzp@ukr.net

**Key words:**
e-commerce, taxation, business entity, electronic documents, Internet commerce

The article examines and systematizes the current legal framework for registration, regulation of economic activity, settlement operations, accounting and taxation of enterprises operating through the Internet to determine the vectors of its further development and improvement. The analysis was conducted on the basis of the Constitution of Ukraine, the Commercial Code of Ukraine, the Tax Code of Ukraine, the Criminal Code of Ukraine, the Civil Code of Ukraine, the Law of Ukraine "On E-Commerce", the Law of Ukraine "On Consumer Protection", premises, Rules of retail trade in non-food products. The study was conducted using methods of systematization and generalization. The key problematic aspects of legal regulation of e-commerce in Ukraine are highlighted. The concepts, features and problems of conducting e-business are analyzed, which gave an opportunity to suggest ways to improve the legislative regulation of this area. One of the main problematic aspects of eligibility in the field of Internet commerce is the fact that sellers are unregistered legal or physical persons. It has been shown that the appointed shortfalls make it easier to estimate the amount of tax deducted from this sphere, as a result, significantly reducing the amount of tax dues and taxes to the sovereign budget of the country. Therefore, in order to find methods of de-shadowing and stimulate the development of e-commerce, options have been proposed to reduce the tax burden on these economic entities.

## АНАЛІЗ ПРОБЛЕМНИХ АСПЕКТІВ ІНТЕРНЕТ ТОРГІВЛІ В СФЕРІ ОПОДАТКУВАННЯ В УКРАЇНІ

**Проскуріна Н.М., Конєва А.В.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
електронна комерція, оподаткування, суб'єкт господарювання, електронні документи, Інтернет-торгівля

У статті досліджено та систематизовано діючу нормативно-правову базу з питань реєстрації, регулювання господарської діяльності, здійсненні розрахункових операцій, ведення бухгалтерського обліку та системи оподаткування на підприємствах, що здійснюють діяльність за допомогою мережі Інтернет з метою визначення векторів її подальшого розвитку та удосконалення. Аналіз проведено на основі Конституції України, Господарського кодексу України, Податкового кодексу України, Кримінального кодексу України, Цивільного кодексу України, Закону України «Про електронну комерції», Закону України «Про захист прав споживачів», Правил продажу товарів на замовлення та поза торговельними або офісними приміщеннями, Правил роздрібної торгівлі непродовольчими товарами. Дослідження відбувалося з використанням методів систематизації та узагальнення. Виділено ключові проблемні аспекти правового регулювання сфери електронної комерції в Україні. Проаналізовано поняття, особливості та проблеми ведення електронного бізнесу, що дало можливість запропонувати шляхи удосконалення законодавчого регулювання даної сфери. Одним із головних проблемних аспектів оподаткування у сфері

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інтернет-торгівлі визначено існування продавців які є незареєстрованими юридичними або фізичними особами. Визначено, що усі зазначені недоліки ускладнюють оцінку обсягів отриманих доходів у даній сфері та, як наслідок, значно зменшують надходження податків та зборів до державного бюджету країни. Тому, з метою пошуку методів детінізації та стимулювання розвитку сфери електронної комерції запропоновано варіанти зменшення податкового навантаження на зазначені суб'єкти господарської діяльності.

**Formulation of the problem**

The rapid growth in the number of Internet users, online shoppers, marketplaces, advertising sites and social media pages has significantly increased the importance and role of e-commerce as a place of concentration of financial resources. That is why there is an urgent need to study the peculiarities of regulating economic activity, accounting and defining the tax system in enterprises operating through the Internet.

**Analysis of recent research and publications**

The vast majority of foreign and domestic scientists who dedicate their work to accounting and analytical aspects of e-commerce, the subject of their research choose problematic issues that arise in the field of e-commerce and related to the organization and methodology of accounting in Internet commerce, documentation and reporting, and also taxation. Thus, N. Boreyko [1] studies the general characteristics, the place of online stores in the development of e-commerce in Ukraine and the peculiarities of taxation in this area; Yu. Palamarenko [2] focuses on the theoretical and practical aspects of the organization of accounting; M. Honcharuk [3] dedicates his works to the peculiarities of legal regulation of e-business, the formation of its market value. L. Tovkunta, M. Fedorovska [4] consider the features of regulatory and legal regulation of electronic document management of transactions from the creation of an online store to the sale of goods (services) as a form of e-commerce. L. Chyzhevska and V. Kulyk [5] raise the issue of forming the accounting policy of e-commerce entities. Problematic aspects of accounting for trade activities via the Internet are revealed in the works of A. Kozhelyuk [6], O. Shaleva [7], V. Pleskach, N. Borodachova [8] and other scientists and economists.

Highly appreciating the scientific contribution of these scientists, it should be noted that most of the scientific achievements are aimed at studying Internet commerce in general, the general issues of accounting for e-commerce transactions have been studied in detail. However, the problematic issues of taxation and internal control of e-commerce remain unresolved, as this type of business has a number of specific features. The study and improvement of the procedure of control of e-commerce operations by fiscal authorities and methodological recommendations for their documentation require, as standard tax audit procedures are mostly used and do not take into account the specific features of e-business.

The outlined problematic issues require further theoretical and practical research and priority improvement of legal regulation of Internet trade in the field of taxation in Ukraine.

**Formulation of the objectives of the article**

The object of the work is to study and critically analyze the legal framework of e-commerce taxation in modern business conditions, in order to highlight the features of Internet commerce taxation and determine the conditions for reviewing regulations in this area of Ukraine.

**Presentation of the main material of the research**

Today's business environment is undergoing a significant and rapid transformation caused by the progressive development of e-commerce. The introduction of quarantine restrictions has significantly reduced the number of offline stores and, as a result, increased the proportion of businesses willing to use the Internet to advertise and sell their services, attract new customers and be the main means of doing business. The use of web and Internet technologies allows companies to distribute advertisements about their products or services at high speed, to be in touch with contractors and customers around the clock, to make money transactions instantly.

The rapid development and prevalence of e-commerce in our country requires constant monitoring and improvement of the regulatory framework in the field of business organization, accounting and taxation methods. Improper adaptation to such rapid transformations in this area leads to a lack and inaccuracy of accounting information, financial losses of e-commerce entities and, as a consequence, to a reduction in tax revenues in the state.

The results of the study of regulatory and legal regulation of various aspects of Internet commerce in Ukraine, as well as their purpose, are given in table 1.

In 2021, a new version of the Law of Ukraine № 675 [13] was published, which comes into force on 01.08.2022. This law is currently the only legal act that regulates the peculiarities of Internet commerce in Ukraine.

E-commerce is a relationship aimed at making a profit and arising in the course of transactions for the acquisition, modification or termination of civil rights and obligations, carried out remotely using information and telecommunications systems, as a result of which the parties have rights and obligations. property languages [13].

It should be noted that the Law of Ukraine Law of Ukraine № 675 [13] is not new for Ukraine, the Law has been in force since 2015 and has a number of problematic aspects, among which are:

– the main provisions of electronic contracts are not outlined, such as: details of both parties to the contract, the procedure for drawing up and affixing electronic signatures, the procedure for amending the terms of the contract, the procedure for electronic document management;

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Table 1 – Regulatory regulation of Internet commerce in Ukraine

| Normative document | Appointment |
|---|---|
| Constitution of Ukraine [9] | Everyone has the right to conduct business in accordance with applicable law. The country guarantees the protection of competition in such activities. |
| Economic Code of Ukraine [10] | Regulates the mechanism of interaction between business entities and consumers, including e-commerce. |
| Tax Code of Ukraine [11] | Establishment of requirements and restrictions on taxation of e-commerce enterprises, rules on the application of the simplified taxation system. |
| Criminal Code of Ukraine [12] | Determining the list of goods that are illegal for sale via the Internet, and criminal liability for this transaction. |
| Law of Ukraine "On e-commerce" [13] | "… determines the organizational and legal framework for e-commerce in Ukraine, establishes the procedure for electronic transactions with the use of information and communication systems and determines the rights and responsibilities of participants in relations in the field of e-commerce." |
| Law of Ukraine "On consumer protection" [14] | Regulates the relationship between persons selling and end consumers of goods, works and services of various forms of ownership, determines the rights of consumers and the mechanism of their protection in accordance with applicable law. |
| Rules for the sale of goods to order and outside retail or office space [15] | Contains basic information on:<br>– relations between the persons who buy and the persons who are engaged in sale of the goods by the order and out of trade premises in the presence of the contracts of purchase and sale concluded remotely;<br>– rules of proper trade service and sale of quality and safe goods. |
| Rules of retail trade in non-food products [16] | Outlines the procedure for buying, storing and selling non-food products through the retail network, and also contains requirements for the implementation of consumer rights to appropriate, high-quality and safe goods and an acceptable level of service in the retail network. |

– incorrect definition of the term «online store», as it is interpreted as a means, ie an action to achieve the goal. More accurate, in our opinion, is the definition of the online store as a result of intellectual activity in the form of not a physical but a virtual platform for the sale of goods, works and services;

– uncertainty of a clear list of objects of civil rights that are prohibited for sale with the use of information and communication technologies;

– natural persons-entrepreneurs dropped out of the regulation of purchase / sale of goods, works and services. This fact makes it impossible to protect the rights of consumers in this part of Internet commerce. There is a discrepancy with the Civil Code of Ukraine, as buying and selling is regulated regardless of whether it is a legal entity or an individual;

– uncertainty of key terms of e-commerce: «e-service», «e-shop», «consumer of e-commerce», «e-service», which can lead to difficulties in protecting the rights and interests of consumers, individuals and legal entities;

– lack of a complete list of all available e-commerce models and methods.

A large number of inconsistencies and inconsistencies in 2021 led to the wording of the new Law of Ukraine № 675 [13], which comes into force on 01.08.2022. Among the advantages of the new wording are: legislative consolidation of basic principles of e-commerce; the presence of interpretations of basic concepts in this area, which were not mentioned earlier; determining the legal status of all participants in e-commerce; extension of the Law of Ukraine № 1023 [14] to persons who purchase goods and services via the Internet; outlines the rights and responsibilities of all participants in this type of trade; a detailed description of the procedures for concluding an electronic contract and protection of personal data is given. The main achievements can be considered that the electronic transaction is equated to paper, sellers must disclose truthful information about themselves (information about registration and licenses, names and locations) and goods, services (works) that sell.

Therefore, in order to successfully operate and stimulate the activities of e-commerce entities, it is first necessary to eliminate the previously mentioned shortcomings of the current legislation, which will clearly increase the competitive advantage of e-commerce. More global development in this area can be achieved through further detailed study of the regulatory framework in accordance with the requirements of European legislation and international standards.

In our opinion, one of the most important and difficult issues is the problem of e-commerce taxation. After all, the existing tax legislation regulates the accrual and payment of taxes in the conditions of «ordinary» business and is not aimed at electronic, which is due to the difficulty of tracking cash flows. The situation is complicated by the fact that the sellers on the Internet are not only legal entities or individuals, but also unregistered entrepreneurs. That is why it is almost impossible to estimate the amount of income received through e-business and, as a result, unregistered entrepreneurs do not pay taxes and fees to the state budget. This problem is quite significant, as VAT and sales taxes are one of the most important tools for generating budget revenues.

It should be noted that sales via the Internet are possible when entering this type of activity in the Unified State Register of Legal Entities and / or Individuals. Art. 1 and art. 7 of the Law of Ukraine№ 675 [13] this type of economic activity belongs to the cod of NACE47.91 «Retail trade carried out by mail order firms or via the Internet».

Despite the fact that the Tax Code of Ukraine (hereinafter TCU) does not contain special rules governing online trade, it establishes the legal basis for the application of a general and simplified system of taxation. Given that it is from the moment of state registration that an individual

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acquires legal capacity in the field of entrepreneurial activity, the appropriate status and has the right to conduct business transactions, he must register with the State Tax Service and pay taxes. According to the TCU, such persons can independently choose the tax system. If the total amount of transactions for the sale of goods (services) taxed in accordance with Section V of the TCU exceeds UAH 1 million and supplied via the Internet, such a person must be a VAT payer. Exceptions are taxpayers of the I–III groups (item 181.1) [11].

Examining the legal component of VAT e-commerce taxation, it should be noted that Section V of the TCU does not contain any information about electronic goods and trade in them. This information is specified in the Law of Ukraine№ 675 [13], there is no information about the taxation of this type of economic activity, as well as no interpretation of the concept of «goods in electronic form». In view of the above, we propose to make a reference in the TCU to the regulatory law, and the content of section V to expand the information on the methodology of taxation of transactions in Internet commerce.

Based on practical experience, it can be noted that a significant number of small businesses prefer a simplified system of taxation. This makes it possible to work lawfully with the reduction of the tax burden, which greatly simplifies the accounting of taxes and reporting at the enterprise. But this system has many shortcomings and is not effective enough for e-commerce, which significantly increases the development of the shadow economy in Ukraine.

L. Tovkun and M. Fedorovska [1] in their research notes that in order to alleviate the negative impact of the crisis caused by the pandemic, as well as finding ways to expand the tax base and de-shadow economic activities in e-commerce should consider the introduction of tax holidays or soft loans industry, as well as state support for the financing of the IT industry (in particular, through government procurement for the development and provision of digital services). The introduction of tax holidays for newly created e-commerce entities can also be an effective means of support, which will stimulate the creation of new jobs and, consequently, reduce the number of unemployed in Ukraine and further have a positive impact on the state budget.

It is also important to note that the procedure for taxing e-commerce is quite new for Ukraine, so it requires attention from the state tax service. There is also the problem of registering online stores on foreign platforms with a more loyal tax system and the existence of pages on the network through which the sale of goods / services is no longer carried out. As a result, the presence of these problematic aspects does not allow the supervisory authority to obtain accurate and reliable information on the number of businesses and their registration in the field of e-commerce.

To reduce the influential factors and to establish the procedure for registration of e-commerce entities, fruitful cooperation on data exchange between tax institutions, both at the national and international levels, it is appropriate to develop and implement a specialized software product:

1) for entities that carry out their activities via the Internet – documentation of financial activities, which must be covered on the server of the entity after the registration procedure with the state fiscal service;

2) for the state tax service – control and constant access to information on economic activities of e-commerce entities.

This will develop e-commerce, which will increase the number of online stores and marketplaces in Ukraine, turnover from operations in this area and sales of goods via the Internet, increase the number of taxpayers and tax revenues from e-commerce, as well as innovation of control and monitoring measures – reducing the amount of concealment of income from transactions.

## Conclusions

One of the important and difficult issues is the issue of taxation in the field of e-commerce, because the current legislation regulates the accrual and payment of taxes in «ordinary» business and is not aimed at e-commerce, due to the difficulty of tracking cash flows. The results of the study show that the existence of a large number of regulations that in any way related to the activities of enterprises in the field of e-commerce do not cover and regulate these activities in full. That is why in order to successfully operate and stimulate the activities of Internet commerce entities, first of all it is necessary to eliminate the shortcomings of the current legislation.

Thus, to ensure the exit of e-commerce entities from the shadows, it is necessary to build and implement an additional tax system in accordance with the peculiarities of functioning in this area. The proposed changes can significantly help the development of e-commerce in Ukraine and build a solid foundation for its further development.

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# WAYS TO IMPROVE ACCOUNTING OF PRODUCTION INVENTORIES OF THE ENTERPRISE

**Rybalko O.M., Varlamova I.S., Yerokhina O.S.**
*Zaporizhzhya national university*
*Ukraine, 69000, Zaporizhzhya, Zhukovsky str., 66*
Irina.varlamova.zp@gmail.com, alexerohina99@gmail.com

**Key words:**
accounting, accounting, rational use, stocks, production stocks

The article examines the economic content of the categories "stocks" and "production stocks". The classification of inventories by function, location and method of use is analyzed. It was found that the unified classification of inventories for each individual enterprise is not formed due to their industry characteristics, so this issue should be considered taking into account the specifics of production on the example of an individual enterprise. The list of sub-accounts of inventories is detailed. Problems of accounting of production stocks at the enterprises of Ukraine in the conditions of electronic document circulation are defined. The list of negative factors of influence on accounting of production stocks at the enterprise is defined: low level of efficiency of information maintenance of management of production stocks of the enterprises; inadequate level of control and operational regulation of stockpiling processes; limited control over the use of inventories; the difficulty of determining the fair (market and non-market) value of inventories, which consists in the use of barter exchange enterprises, moreover, the exchange of dissimilar assets; limited control over the use of inventories. The mechanism of improvement of the account of production stocks which can become the main precondition of successful realization of production process is offered; presented a detailed structural model, which includes the order of the necessary ways, the introduction of which into production will optimize the financial and economic activities of the enterprise, optimize the cost of acquisition, transfer to production and rational preservation of inventories, which will promote effective development. The analysis allowed us to conclude that the organization and implementation of the current activities of the enterprise constant internal control over the use of inventories will affect the gradual growth of enterprise profits.

# ШЛЯХИ ВДОСКОНАЛЕННЯ ВЕДЕННЯ БУХГАЛТЕРСЬКОГО ОБЛІКУ ЗАБОРГОВАНІСТЮ ПІДПРИЄМСТВА

**Рибалко О.М., Варламова І.С., Єрохіна О.С.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
облік, бухгалтерський облік, раціональне використання, запаси, виробничі запаси

У статті розглянуто зміст основних термінів: «запаси», «виробничі запаси». Проаналізовано класифікацію виробничих запасів за функціями, за місцем розміщення, за способом використання. Продемонстрований перелік субрахунків виробничих запасів. З'ясовано, що уніфікованої класифікації виробничих запасів для кожного окремого підприємства не сформовано через їх галузеві особливості, тому розглядати це питання необхідно саме із урахуванням специфіки виробництва на прикладі окремого підприємства. На основі наукової літератури охарактеризовано проблеми ведення бухгалтерського обліку виробничих запасів на підприємствах. Серед негативних факторів котрі впливають на ведення бухгалтерського обліку виробничих запасів на підприємстві, є: низький рівень оперативності інформаційного забезпечення управління виробничими запасами підприємств; невідповідний рівень контролю та оперативного регулювання процесів утворення запасів; обмеженість контролю використання виробничих запасів; складність визначення справедливої (ринкової та неринкової) вартості запасів, що полягає у використанні підприємствами

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бартерного обміну, більше того, обміну на неподібні активи; обмеженість контролю використання виробничих запасів. Запропоновано механізм удосконалення обліку виробничих запасів, який може стати головною передумовою успішного здійснення виробничого процесу; представлено розгорнуту структурну модель, яка вміщує в собі порядок необхідних шляхів, упровадження яких у виробництво дозволить оптимізувати фінансово-господарську діяльність підприємств, мінімізувати затрати на придбання, списання у виробництво та раціональне використання виробничих запасів. Виявлено, що раціональне використання виробничих запасів сприятиме ефективному розвиту підприємства. Також даний аналіз дозволить здійснювати якісний поточний контроль їх використання, що в подальшому вплине на поступовий ріст прибутку підприємства.

**Formulation of the problem**

To ensure efficient and uninterrupted operation of finished products, enterprises usually use production stocks that are in its warehouses within the established norms and standards. In order to maintain the optimal limit of relevant production stocks in warehouses, the company carries out operations for their acquisition, taking into account the planned volume of production and sale of finished products.

Accounting, in turn, helps to control the balances, receipts and expenditures of inventories, which in turn affects the preservation of property of each enterprise.

The implementation of effective measures to stabilize the economy of Ukraine and the transition to market relations require fundamentally new approaches to the management of inventories of the enterprise in terms of electronic document management. This necessitates the improvement of the organization and methods of accounting for production stocks of the enterprise and compliance with the requirements of market infrastructure.

The issues of analysis of supply and use of production stocks at the enterprise are of great practical importance and production orientation, as full supply of production stocks and their efficient use is a prerequisite for further development of the economic process at the enterprise.

**Analysis of recent research and publications**

The problem of inventory accounting is considered in the scientific works of F. Butynets, B. Valuev, S. Golov, L. Zhilkina, Z. Gutsailyuk, M. Kuzhelny, V. Linnyk, V. Rudnytsky, N. Tkachenko, A. Makarenko [2], V. Sopko, P. Smolenyuk, I. Pavlyuk [5] and others. O. Baldueva and O. Rybalko emphasize the improvement of inventory accounting on the example of individual enterprises [9, p. 211].

Among foreign researchers we can single out E. Altukhov, H. Anderson, S. Barnholtz, S. Volkov, E. Kozlov and others. But at the same time the issues of organization and methods of accounting for inventories in modern conditions remain relevant and need to be improved, because in the conditions of remote introduction of business activities and the influence of other important factors it is necessary to find ways to effectively optimize this issue.

**Formulation of the objectives of the article**

The objectives of the article are to analyze the organizational and methodological aspects of accounting for production stocks of the enterprise and the formation of ways to improve them.

**Presentation of the main material of the research**

By the term stocks of the enterprise we mean resources that are not currently used and are the property of the enterprise being in warehouses of enterprises, warehouses of suppliers and warehouses of consumers, or in other designated places, held to support activities: production, sales, resale, and are used to manage the enterprise.

International Accounting Standards explain the category of inventories in more detail. Thus, based on International Accounting Standard 2, inventories are assets that:

a) in the form of raw materials and other materials intended for consumption in the production process or the process of providing services (raw materials and supplies);

b) are kept for sale in the ordinary course of business (goods);

c) are in the process of production (services) for sale (finished products, semi-finished products, work in progress) [5, p. 14].

According to Yu. Romanyuk, production stocks act as material resources used for production during one production cycle, fully transfer their value to the cost of production, rational management of which is one of the conditions for efficient management [10, p. 4].

Instead, O. Rybalko revealed this term more precisely. The author emphasizes that production stocks are objects of labor that are in the company in the form of stocks of basic and auxiliary materials, as well as fuel, spare parts, returnable waste, containers and other materials that are intended for use in the production process and for any other needs of the enterprise under the condition of their full consumption in one operating cycle [9, p. 210].

Inventory accounting is organized by name (types) of raw materials, and within each type – by sections, types, groups, varieties and individual names, ie by individual nomenclature numbers, units of quantity and quality and historical cost.

Consider in more detail the classification of inventories in Fig. 1

For the organization of synthetic accounting of the availability and movement of inventories at the enterprises

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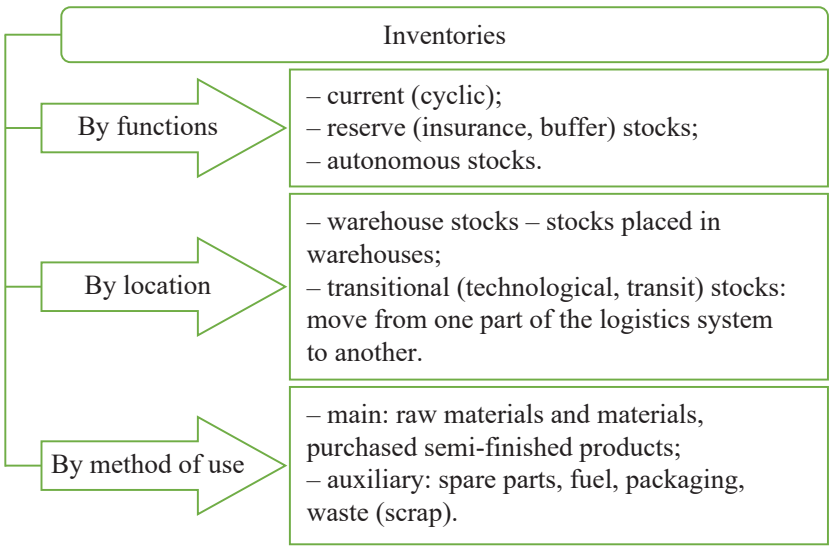


Fig. 1 – Classification of inventories

of Ukraine is used account 20 «Inventories» on the sub-accounts shown in table 1.

Table 1 – Subaccounts of inventories

| **20 "Inventories"** | |
|---|---|
| **№ Subaccounts** | **The name of the sub-account** |
| 201 | Raw materials |
| 202 | Purchase semi-finished products and components |
| 203 | Fuel |
| 204 | Containers and packaging materials |
| 205 | Building materials |
| 206 | Materials transferred for processing |
| 207 | Spare parts |
| 208 | Materials |
| 209 | Other materials |

In the debit accounting of each of the above. 1 sub-account reflects the receipt of inventories at the enterprise and as a result of revaluation – an increase in the value of inventories. In the accounting for the loan of each of those listed in table. 1 sub-accounts reflect the use of inventories, including the production of finished products, sales to contractors on the basis of concluded contracts, reducing the value of inventories due to fair discounts by the decision of the relevant commissions of the enterprise.

It should be noted that most of the production stocks at the enterprises are purchased from suppliers (both domestic and foreign) on the basis of agreements, contracts and related agreements. Equally important is the fact that after shipment, the supplier issues an invoice (bill) or other settlement and payment documents for tangible assets. In such documents, it is usually necessary to indicate: the name of production stocks, their nomenclature number, unit of measurement, quantity, variety, price of stocks, the total amount to be paid, indicating the amount of VAT.

The classification of inventories is of paramount importance for the formation of accounting policies for inventories. However, a unified classification of inventories for each individual enterprise can not be recommended due to their sectoral characteristics, so this issue should be considered taking into account the specifics of production of these enterprises.

According to I. Pavlyuk, among the main problems faced by enterprises when accounting for inventories are the difficulty of determining the fair value of inventories, which may be market or non-market, due to the fact that companies use barter or exchange for dissimilar assets [6, p. 40].

A. Makarenko has a slightly different opinion, who believes that the process of accounting for production stocks slows down the low level of efficiency of information support for the management of production stocks of the enterprise [2, p. 27]. In our opinion, the problems of organizational and methodological nature include the inadequate level of internal control and operational regulation of inventory processes and limited control over the use of inventories at the enterprise. Therefore, for the successful implementation of the production process at the enterprise it is necessary to improve the documentation of operational and analytical accounting of inventories.

We believe that among the effective ways to improve the introduction of inventory accounting is by simplifying the registration of operations related to the movement of inventories, which in turn will allow effective control over the careful and timely inventory and improvement of inventory accounting methodology and determine the optimal needs in the amount and rational use of inventories.

An effective solution to the problem of preserving inventories can be the construction of each enterprise's own storage facilities and equipping them with the latest measuring instruments, measuring containers, lifting mechanisms.

One of the main organizational aspects of the preservation and availability of inventories is a timely inventory, inspections of the release of inventories into production.

The practical experience of the authors made it possible to state that the improvement of inventory accounting is

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possible only by improving the process of documenting and using cumulative documents, ie information, limit-collected cards, inventory cards as a cost document for released materials, taking into account the development of IT technologies.

In the conditions of computerization and digitalization of accounting, it is expedient to form a single form of document, which is intended for the release of inventories in the system of electronic document management. In this document, we propose to indicate the objects of both primary and secondary production under the appropriate codes, which may indicate for what purposes a particular resource is needed, in turn spare parts and basic products, one-time orders, repair and maintenance needs will be formed not in a large number of different documents but in one.

There is an urgent need to develop detailed instructions for specific executors, these can be job descriptions, extracts from document schedules, which, in our opinion, will avoid errors and violations in the collection and registration of operational facts about inventories. At the same time, both the system of incentives and the system of penalties (for example, fines, deprivation, etc.) for the performance (non-performance) of their duties by specific performers should be developed in each company.

As a result of our proposed mechanisms to improve the accounting of inventories at the enterprise will determine the optimal need for inventories and their rational use.

## Conclusions and prospects of further research in this direction

Thus, having considered the problems of accounting for inventories at the enterprise, we have identified ways to improve the accounting of inventories at the enterprise, namely: the use of unified forms of primary and consolidated documentation; introduction in the system of accounting policy of the enterprise of detailed schedules of document circulation of production stocks; control over informing the executors of their functional responsibilities when creating and verifying the primary document.

In our opinion, it will be effective to issue administrative documents to persons who are responsible for conducting business operations and have the right to sign primary documents. Equally effective will be the organized control by accounting staff and the accuracy and timeliness of the primary documentation of inventories.

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# THEORETICAL AND APPLIED ASPECTS OF ECONOMIC PROCESSES IN UKRAINE AND IN THE WORLD ECONOMY

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## STATE REGULATION OF AGRICULTURAL PRODUCTS EXPORT DEVELOPMENT IN UKRAINE

**Bugai V.Z., Ipatko M.I.**
*Zaporizhzhia National University*
*Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 66*
bugai_v_z@ukr.net, margo_ipatko@ukr.net

**Key words:**
state, export of goods, agricultural products, State Statistics Service of Ukraine, Council on International Trade, trading partners, development strategy

This article is devoted to exploring aspects of the formation and development of the agro-industrial complex in Ukraine, its changes in the conditions of global globalization, methods and ideas for the development of this sector and increasing the level of profitability by expanding the market of Ukrainian agricultural products worldwide. The main stages of development of Ukrainian export of agricultural products from independence to the present are formulated, its main indicators of periods (and exceptional situations) are described. The key problems of the further development of Ukrainian exports were identified, among them: the discrepancy between the quality of Ukrainian agricultural products produced for foreign consumers and the European and world standards. The content of recent important strategic events and conferences, which have substantiated the aspects and prospects of development of Ukrainian exports in the international market, as well as the further role of Ukraine in the world arena in the context of the future increase in global demand for cheap food products, which will be caused by a sharp increase in the number and more at the expense of the eastern countries (India, China, etc.). Long – standing and recent free trade agreements between Ukraine and other countries are described, as well as prospects for future export – import agreements and new free trade areas. The analysis of structural changes in the lists of trading partner countries of Ukraine in recent years, with an indication of their shares in total exports. The main obstacles to the effective development of export of agricultural products are outlined. The data on the place of production of agroindustrial complex in the formation of total export of Ukraine is also given and, as a result of all the above, the recommendations on the development of agroindustrial complex of agriculture are formulated, provided that all the recommendations listed in the article are fulfilled.

## ДЕРЖАВНЕ РЕГУЛЮВАННЯ РОЗВИТКУ ЕКСПОРТУ ПРОДУКЦІЇ АПК В УКРАЇНІ

**Бугай В.З., Іпатько М.І.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
держава, експорт товарів, продукція АПК, Державна служба статистики України, Рада з міжнародної торгівлі, торговельні партнери, стратегія розвитку

Цю статтю присвячено дослідженню аспектів формування та розвитку агропромислового комплексу в Україні, його змінам умовах світової глобалізації, методам та ідеям щодо розвитку цього сектору та підвищенню рівня дохідності шляхом розширення ринку збуту української сільськогосподарської продукції по всьому світу. Сформульовано основні стадії розвитку українського експорту продукції агропромислового комплексу від отримання незалежності до сьогоднішнього часу, описані його основні показники періодів (та виключні ситуації). Знайдено ключові проблеми подальшого розвитку українського експорту, серед яких: невідповідність якості української сільськогосподарської продукції, яку виробляють для іноземних споживачів, щодо європейських та світових норм. Проаналізовано зміст останніх важливих стратегічних заходів та конференцій, на яких обґрунтовували аспекти і перспективи розвитку українського експорту на міжнародному ринку, а також подальшу роль

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України на світовій арені у розрізі майбутнього збільшення світового попиту на дешеві продовольчі товари, який буде викликаний різким кількісним збільшенням населення планети здебільшого за рахунок східних країн (Індія, Китай тощо). Описані вже давно існуючі та нещодавні угоди вільної торгівлі між Україною та іншими країнами світу, а також окреслені перспективи щодо майбутніх експортно-імпортних угод та нових зон вільної торгівлі. Наведено аналіз структурних змін у списках країн-торговельних партнерів України за останні роки з зазначенням їх часток від загального експорту. Виведено основні перепони ефективного розвитку експорту продукції агропромислового комплексу. Також наведено дані щодо місця продукції АПК у формуванні загального експорту України і, як результат усього вищезазначеного, сформульовано рекомендації щодо розвитку експорту АПК за умов виконання усіх рекомендацій перелічених у статті.

**Statement of the problem**

Ukraine, by geographical and climatic conditions, is one of the countries focused on agricultural activities. In the context of global globalization, which is now spreading in the world, Ukraine needs to further increase its production volumes in the agro-industrial sector, which is currently the most important in generating export earnings, so as not to lose positions in the world arena, and possibly even expand their influence.

But despite the increasing volume of Ukraine's trade with the EU, which has been observed in recent years, the share of trade in agricultural products with Ukraine in the total foreign trade turnover of EU countries remains extremely small – this is due to many reasons.

Grain and oilseed crops remain the main products of Ukrainian exports. In most periods, the total value of all imported goods exceeds their export volume. In general, geographical and commodity structural shifts in Ukraine's foreign trade reflect the reorientation of exports and imports to more developed markets, which, on the one hand, expands the potential for increased foreign trade and, on the other, leads to increased competition, new procedural barriers to high demands to quality.

The main instruments for strengthening the position of domestic agricultural products in foreign markets are the development of marketing infrastructure, state support and expansion of sources of financing, improvement of price relations for agricultural products and other sectors of the economy, regulation of land relations.

**Analysis of recent studies and publications**

The development of Ukrainian exports in recent years has been and remains a widespread topic for discussion, in particular the export of agricultural products is often the central topic of many scientific papers. Scientists such as N.A. Karasova, U.I. Lupenko, M.I. Pugachev, I.Y. Grishova, A.A. Melnik have dedicated their articles and scientific papers to this topic. I also want to note that despite the same object of research, each of the scientists open and in-depth describe different aspects of this topic.

**Objectives of the article**

The purpose of the article is to study the current trends in Ukrainian exports of agro-industrial complex, to find the main obstacles for the development of Ukrainian exports of these products and to create the most effective proposals to address these problems and further development of this industry.

**The main material of the research**

Observing the volumes and trends of export of Ukrainian agricultural products for 1997 to 2020 according to the State Statistics Service of Ukraine [1], it is possible to distinguish several stages of this process:

1) moderate growth (1997–2007). The volume of export of agricultural products gradually increased, ensuring an average annual growth of almost 12.5% (the exception is 2000 and 2003);

2) reduction (2008–2010) – began with a sharp increase in export volumes (in 2008) – almost 3 times compared to the previous year, later a downward trend began (average annual decline – 14%);

3) destabilization (from 2011 to the present). During this period, the average annual change in the volume of domestic exports of agricultural products was 13.8%, but conflicting dynamic trends arose and spread; in 2011–2012 there was a sharp increase in export volumes, first by 36.2%, and then by another 57.4%; after that, a bearish trend began, which lasted three years with an average annual rate of decline in trade in 2013–2016. in 4.7%; only in 2017 a new growth trend was launched, which continues now.

In the current conditions of globalization and integration of the global economic system, in order to remain in a favorable position in the international division of labor or, conversely, to improve them, Ukraine needs to make efforts to formulate a strong export policy. For this, first of all, it is necessary to remove Ukrainian exports from the crisis.

In the spring of 2019, the III session of the International Trade Council was held under the chairmanship of the First Vice Prime Minister – Minister of Economic Development and Trade of Ukraine Stepan Kubiv. In addition to analyzing the implementation of previous orders and plans, it was also noted that export remains one of the engines of economic growth in our country, forms about 50% of GDP, and is also constantly growing due to effective government policy. The First Vice Prime Minister of Ukraine – Minister of Economic Development and Trade of Ukraine noted that in 2019 the volume of exports of goods and services increased by 8.6% compared to 2018 and amounted to $57.1 billion [2].

It was also noted that in recent years, even in very difficult political, economic and social problems in the country, it has been possible to establish new free trade

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agreements with the EU, Israel and Canada. In connection with the emergence of the military situation and the establishment of new economic ties, the sales markets were partly reoriented to the EU and, accordingly, the number of deliveries to Russia was reduced, but it will still remain in second place among the ranking of countries – trading partners in the export of goods and services from Ukraine (EU – 40.3% of total exports for 2019, Russia – 12.2%) [3]. It can be added that according to the results of the first half of 2020, part of the export load from Ukraine in these countries decreased and amounted to 39.9% and 11.0%, respectively (Fig. 1) [4].

The geography of supplies of agricultural products (Fig. 2) has significantly expanded over the past decades, and today Ukrainian food, to one degree or another, is represented on all continents of the planet. However, the main connoisseurs of products from Ukraine are the countries of Europe and Asia.

On July 10, 2019, an order of the Cabinet of Ministers of Ukraine «On approval of the Strategy for the Development of Export of Agricultural Products, Food and Processing Industry of Ukraine for the Period until 2026» entered into force. It indicates the recommended export directions, which should be developed taking into account the current situation in the country and taking into account forecasts for the next 5 years. A major role in this order is given to increasing the volume of exports of the agricultural sector and maintaining almost constant trends towards an increase in these indicators (an increase from 21% to 44% of the share of agricultural products in total exports from 2010 to 2019, as well as a record increase in monetary terms: agricultural exports in 2019 increased by more than $2 billion compared to 2017 and amounted to $13.5 billion) [6].

The main problems for the further development of exports in these areas, and as a reason, and the development of the agro-industrial and agricultural sectors are:

– constant timely adaptation to changes in climatic conditions;

– an increase in the diversity of agricultural, food and agricultural products for export;

– increasing export-oriented production in conditions of limited domestic demand;

– improving and simplifying the conditions for entering foreign markets for domestic private and state enterprises;

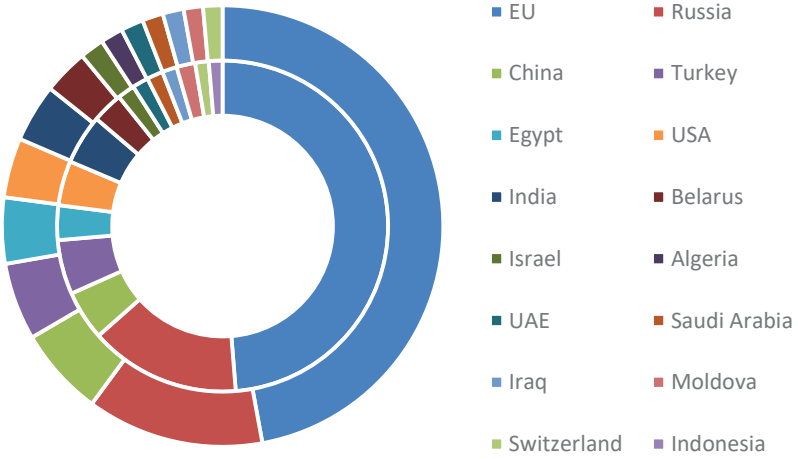


Fig. 1 – TOP-15 trading partners of Ukraine in the export of goods and services in 2018 and the first half of 2020

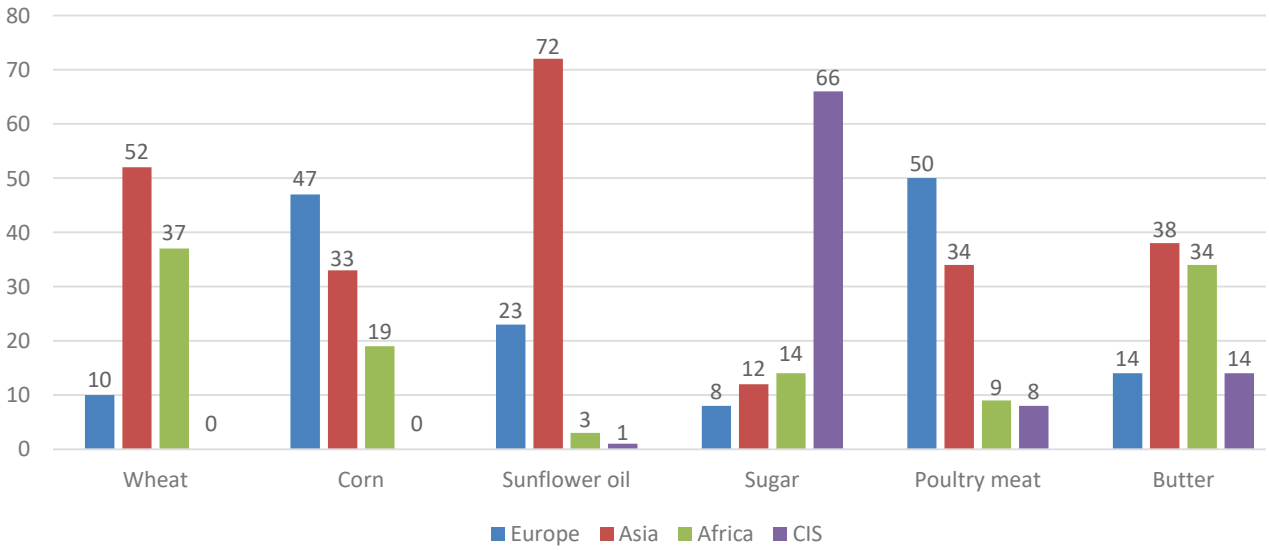


Fig. 2 – Geographic structure of agricultural exports in 2018 (billion USD) [5]

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− improving the norms and quality of products for export and for domestic sales.

In recent years, agricultural and food industry products occupy the largest share in the structure of Ukrainian exports (39.3% in 2019, 41.5% in the first half of 2020) and make a large contribution to the country's GDP, therefore it is a strategically important industry and should receive decent funding for maintenance and development.

In recent years, the following data can be observed on the export structure of the studied industries: agricultural and food industry products in 2019 amounted to $1681,8 million, which is 4.8% more than in 2018 (in monetary terms, an increase of $855.9 million), As of the first half of 2020, exports of agricultural and food products amounted to $10155,7 million, which is 19.1% more than for the same period in 2019 (in money terms + $1629,6 millions).

Ukrainian exports are very dependent on fluctuations in trends and prices on the foreign market, but if we look at the prospects of global demand, Ukraine may come to a stronger position. The fact is that according to world forecasts for the next 10–15 years, an increase in the world population is expected (primarily growth in Africa and Asia). Such a population boom will increase the demand for food products, and due to the differentiation of incomes and progressive poverty indicators among the population, the demand for cheap food products will mainly increase. This will prompt Ukrainian exports due to the attractive pricing policy of Ukrainian goods in open foreign markets. Confirmation of these forecasts can be the UN Summit, which took place in the fall of 2015. The main theme of which was the threat of rapid population growth in the world, ways to provide the population with the necessary amounts of food and the participation in this issue of agricultural countries, in particular Ukraine.

The above-mentioned prospects for the development of export of agricultural products and food industry in the context of appropriate implementation can help ensure:

− establishing trade relations in already accessible foreign markets and introducing new trade relations with other countries, their strengthening;

− a change in the structure of exports of Ukraine, expanding the list of products for export;

− raising product standards for both external and internal sales markets, introducing new, better quality control systems for product quality at the level of legislation;

− constant timely technical, technological and innovative updating of agricultural equipment and equipment of the food industry sector;

− protectionism policy for export-oriented enterprises, in particular, agricultural enterprises and equipment of the food industry;

− the formulation of precise goals for expansion, cooperation and development directions for the studied industries, approved by the Ministry of Agrarian Policy;

− increase in export of products from these sectors and consolidation of growth indicators as a standard of development.

## Conclusions

Ukrainian exports of agro-industrial products have undergone three major stages of their development since Ukraine's independence: moderate growth, recession, and now in a somewhat destabilized situation, but increasing every year.

According to the results of the research, it can be argued that exports of Ukrainian agricultural products to the countries of the world make up almost half of national income and almost 2% of agricultural products on the world market, but even so domestic exports have a very big potential for expanding markets, improving product quality, etc. e. This is due to a number of factors, among which can be highlighted the future need of multi-populated countries to provide cheap food. In recent years, Ukraine's role in the international market has been much discussed both internally and at international strategic conferences.

As of today, the main foreign consumers of national agro-industrial products are the EU, Russia, China and Egypt, which buy almost 70% of exported products.

The main problems of expanding the sales area of Ukrainian products were highlighted, namely: problems of adaptation of the process of cultivation of agro-crops to the variability of weather conditions, uniformity of production and the need for its diversification, increase of production and products for export, non-conformity of production to international quality standards, and also remains a problem Ukraine's entry into foreign markets.

In order to solve these problems, it is proposed to establish links in the already available markets and to gradually conclude new agreements, increase production and production volumes, expand the list of exported goods, keep up-to-date equipment updates, introduce innovative approaches, change legislation on export policy, the provision of benefits to export-oriented enterprises, and the creation of a favorable investment climate for such enterprises.

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# CURRENT TRENDS OF UKRAINIAN METALLURGICAL MARKET EQUILIBRIUM FORMATION IN THE CONTEXT OF EUROPEAN UNION MEMBER STATES

**Hamova O.V.**
*Zaporizhzhia National University*
*Ukraine, 69600, Zaporozhzhia, street Zhukovsky, 66*
gamova5oxana@gmail.com
ORCID: 0000-0002-9752-6900

**Key words:**
metallurgical market, market equilibrium, export-oriented model, competitiveness, innovation, European vector of development

Equilibrium in the Ukrainian market of metal products is a separate, deep issue and a scientific problem that should be studied in detail and justified in terms of market conditions and domestic levers of influence and regulation. To address this issue, it is necessary to find out what exactly includes the concept of the metallurgical market of Ukraine, under the influence of which factors demand and supply are formed, and what determines the mechanism for establishing optimal demand, supply and prices in this market. This article is devoted to these questions, as well as to identify methods to improve the efficiency of the domestic metallurgical market in a dynamic environment and openness to change that will promote its development, increase effectiveness and, consequently – rise welfare and the economy as a whole. The purpose of the study is to analyze and identify problems related to the functioning of the market of metallurgical products, study the basics of its operation, determine the factors influencing supply and demand, which will approve the effectiveness of individual market transformations and confirm their feasibility, as well as adjust or neutralize. The theoretical and methodological basis of the work are the publications of domestic and foreign scientists in the field of evaluating the effectiveness of metallurgical enterprises. To achieve this goal general and special research methods are used, such as: a systematic approach, methods of analysis and synthesis, methods of logical generalization. The article examines the current state, trends and main factors influencing the formation of market conditions in the domestic market of metallurgical products. The last tendencies and structural shifts in the world metallurgical market are analyzed, the priorities of the direction of foreign economic activity of the domestic metallurgical branch are determined. The advantages and disadvantages of the modern model of market functioning of the metallurgical market are defined taking into account its export orientation, which is a traditional strategy and currently irrelevant in the light of global transformations of the world metallurgical market. Weaknesses of the domestic metallurgical market have been identified, which are causing stagnation in the industry and need to be urgently addressed at the national level. Perspective methods and directions of improvement of activity of the domestic metallurgical market in the light of orientation of foreign economic policy on a sector of the markets of the member states of the European Union are defined.

# СУЧАСНІ ТЕНДЕНЦІЇ ФОРМУВАННЯ РІВНОВАГИ НА МЕТАЛУРГІЙНОМУ РИНКУ УКРАЇНИ В КОНТЕКСТІ КРАЇН-ЧЛЕНІВ ЄВРОПЕЙСЬКОГО СОЮЗУ

**Гамова О.В.**
*Запорізький національний університет*
*вул. Жуковського, 66, м. Запоріжжя, Україна*

**Ключові слова:**
металургійний ринок, ринкова рівновага, експортоорієнтована модель, конкурентоспроможність, інновації, європейський вектор розвитку

В статті виконано дослідження сучасного стану, тенденцій та основних чинників, що впливають на формування ринкової кон'юнктури вітчизняного ринку металургійної продукції. Проаналізовано останні тенденції та структурні зрушення в світовому металургійному ринку, визначено пріоритети спрямування зовнішньоекономічної діяльності вітчизняної металургійної галузі. Визначені переваги і недоліки сучасної моделі ринкового функціонування металургійного ринку з урахуванням його експортної орієнтації, що є традиційною стратегією та на сьогоднішній день неактуальною в світлі глобальних трансформацій

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світового металургійного ринку. Виявлені слабкі сторони вітчизняного металургійного ринку, що спричиняють стагнацію в галузі та потребують нагального вирішення на загальнодержавному рівні. Визначені перспективні методи і напрями вдосконалення діяльності вітчизняного металургійного ринку в світлі орієнтації зовнішньоекономічної політики на сектор ринків країн-членів Європейського Союзу.

**Problem statement in general and its connection with important scientific or practical tasks**

The metallurgical market of Ukraine is an important factor in the competitiveness of the economic system, which has a significant impact on the formation of the country's welfare. Peculiarities of its functioning, pricing processes and establishment of equilibrium prices for metallurgical goods are important issues, the solution of which requires attention from scientists and practitioners involved in the activities of this sector of the economy. The metallurgical complex is one of the most potentially important sectors of the economy and is the largest basic industry in general, which forms together with other industries the overall level of socio-economic development of the country. In addition, the metallurgical industry, forming a complex market system, is the basis for the formation of other key manufacturing, including engineering, chemical industry, construction. And in our country, metallurgy is the primary export-forming sector of the economy, which in turn affects significantly the definition of vectors for the development of the export direction of foreign economic policy. Therefore, identifying the factors influencing the level of development of the metallurgical complex in terms of its individual components, which form the general market situation, does help to increase the competitiveness of domestic producers of metallurgical products and is a source of improving the economic system of Ukraine.

In recent years, the metallurgical industry of Ukraine has reduced its production and lost significantly market position in both international and domestic markets, which was caused by many reasons. Despite the fact that domestic metallurgy has great potential and competitive advantages in the market, but under pressure from global producers and the rapid development and introduction of innovative production methods in industry by other competing countries, this sector of our economy is forced to adapt to change due to loss of market leadership. Therefore, the definition of directions of development of metallurgy of Ukraine in the context of global market interaction requires detailed analysis, as well as making recommendations on the basis of this analysis for strategic progress of domestic enterprises in order to fully function at the global level, taking into account the priority areas of enlargement and the choice of the European segment of the global market of metallurgical products as a promising market niche.

**Analysis of recent research and publications, which initiated the solution of this problem and on which the author relies, the highlighting previously unsolved parts of the general problem, which are the subject of this article**

Metallurgy as a leading sector of the domestic economy has always attracted and continues to attract considerable attention from a large number of researchers and scientists, analysts and practicing leaders. In particular, in recent years the works of A. Amosha, V. Bolshakov [2], S. Kulytskyi [2], V. Grynko, I. Androsova [3], N. Kushakova [6], D. Dovhan [10], O. Honcharuk, T. Ignashkina [11] are devoted to the problems of the metallurgical industry, identification of its problems and prospects of development. In addition, researchers such as L. Deineko [5], T. Hurtovenko [8], O. Temchenko, N. Shevchuk [4], T. Hudz [12], S. Kukhno [13], V. Wenger [5] paid attention to the analysis of the competitiveness of the domestic metallurgical market and the identification of its competitive potential in the context of global challenges affecting the formation of supply and demand in this market. However, the issues remain insufficiently resolved about generalization of the current state, problems and prospects of development of the metallurgical market of Ukraine as a subject of world market relations in modern conditions of operation, the peculiarities of the formation of market equilibrium of the metallurgical market at the global and domestic levels. Dynamic changes and rapid development of technologies, improvement of production methods by industry leaders and changing priorities in the structure of world production require further research on the factors influencing the position of the domestic metallurgical market on the world stage.

**Formulation of the goals of the article (task statement)**

The purpose of the study is to analyze and identify issues related to the functioning of the market of metallurgical products, investigate the basics of its operation, determine the factors influencing supply and demand, which will approve the effectiveness of individual market transformations and confirm their expediency, as well as adjust or level the action of others.

**Presentation of the main material of the study with a full justification of the obtained scientific results**

The issue of market equilibrium has always been on the focus of many researchers, as the success of market mechanisms and the level of well-being of all participants in market relations, namely – suppliers and consumers – depend on it. Throughout the existence of economic relations between them, conditioning by the action of many factors and the specifics of the product that is the object of purchase and sale, the peculiarities of establishing market equilibrium are determined and taken into account individually, but under the influence of patterns, which is why this issue needs additional attention and research. As for the establishment of equilibrium in the market of metallurgical products, this aspect should be considered in the context of national and global operating conditions at the same time.

Today, the problem of economic equilibrium remains one of the key problems in political economy. If economic

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equilibrium is observed in one or more enterprises in the absence of market equilibrium – this is a sign of monopoly or oligopoly, respectively. This is exactly the situation in Ukraine. In the economy of Ukraine, the vast majority of leading enterprises have a certain level of financial imbalances. The worst situation is in the chemical industry and technologically related metallurgy. The unbalanced financial condition of most companies does not promote healthy competition among them. Further debt growth will lead to an increasing deviation from equilibrium. The cost of industrial production of domestic enterprises is constantly under pressure from prices for energy, raw materials and supplies, and its high level has a negative impact on competitiveness in both domestic and global markets [4].

Ukraine belongs to the group of countries with the so-called «small open economy». Its share in world GDP was only 0.18% last year, so it is «small» and «open», as the country exports and imports a significant share of goods and services [7]. As the scale of openness of the national economy increases, the range of connecting links of direct interaction of individual markets and enterprises with the world economic community expands. The global market, which is the integration of separate markets, in which both governments and businesses are involved, transmits the dynamics of the global market: both its equilibrium and its entropy. The strength of the impact of these impulses depends on the degree of integration of the economy of states and enterprises themselves in world economic processes [12]. That is why the formation of an effective vector of the metallurgical industry of Ukraine and achieving high competitive positions in the international market is possible under the full use of market mechanisms in both domestic and foreign markets, taking into account the factors that create a perfect competitive environment. An important issue is the study of the conditions of the market of metallurgical products in terms of its individual components and the identifying mechanisms for the formation of the market environment, which also determines the type of market and affects the results of market interaction between trade participants.

Metallurgy is a strategic component of the national economy, as the growth of most industries in Ukraine is contingent on its development, it is an important source of foreign exchange earnings, is a leader in tax deductions to the state budget and a source of many jobs [6]. The metallurgical complex provides more than 25% of industrial production, 34% of total exports of goods, Ukraine's share in world steel production is 2.4%. Large metallurgical complexes play a significant role in the development of regional economies and the functioning of their social infrastructure [4]. Investment in this sector is the highest among other industries. Last year companies of mining complex invested every third dollar in industries – a total of $1.7 billion [8].

In the mid-1990s, the formation of the national market of metal products began in Ukraine by transforming the metallurgical industry into a modern market structure with all its infrastructural and institutional elements [14]. Today, the domestic metallurgical complex is a holistic system, which includes separate economic entities that manufacture metal products, combined into a single technological chain «mining and processing of iron ore → coke production → smelting of iron and steel → production of rolled products» (Fig. 1) [6].

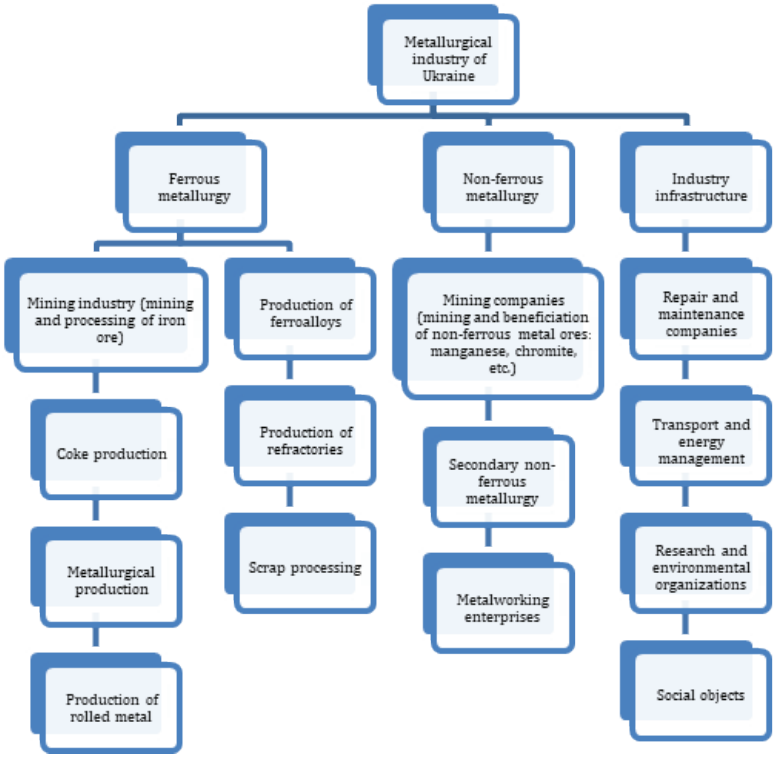


Fig. 1 – The structure of the metallurgical complex of Ukraine

Source: developed by the author based on [14]

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The mining companies that provide mining and beneficiation of iron, manganese and chromite ores are the main raw materials link of the mining complex. On this basis, the work of processing enterprises is provided, which are engaged in the production of iron, steel and rolled products, ferroalloys, reuse of metal raw materials, coking coal, production of refractories and auxiliary materials for them [13]. The peculiarity and main advantage of Ukrainian metallurgy is the reliance of the raw material base on significant internal natural reserves of iron and manganese ores, coking coal, fluxes, refractory clays and other mineral resources. This allows satisfying the needs of the national metallurgical sector in almost all types of strategic raw materials (except natural gas). The industry has a pronounced territorial «binding». Historically, three main metallurgical districts have been formed in Ukraine: Donetskyi, Pryazovskyi and Prydniprovskyi [2].

The metallurgical industry of Ukraine represents an export-oriented industry, which due to the lack of significant qualitative and quantitative advantages of its products in international markets has no decisive influence on the formation of its world price and is forced to adapt to external conditions generated by the dynamics of more important participants in the world economy. The export orientation of domestic metallurgy was caused by vital necessity, attempts to survive in the face of a sharp decline in domestic demand and almost complete lack of working capital in enterprises [14].

Ukraine is almost the only country in the world whose enterprises export nearly 80% of their metal products and sell just over 20% on the domestic market. This is due conditioned by the fact that the metallurgical industry of Ukraine has a production potential that far exceeds the domestic needs of the national economy. However, focusing on the export of metal products, domestic manufacturers have significantly reduced the brand and size range, considerably diminishing the production of high-tech products, which indicates the imperfection of exported products [2]. The supply of raw materials and semi-finished products to major competitors in world markets further worsens Ukraine's position in the global division of labor and leads to further reduction of markets for finished products and significant losses of foreign exchange for mining complex [10].

The enterprises of MMC of Ukraine supply to the world market: iron ore raw materials, including concentrate, pellets and lump ore, ferroalloys, cast iron, semi-finished products (square billet, slabs, pipe billet), finished rolled metal, including hot-rolled and cold-rolled rolls and sheets, as well as profile rolling in the form of round, square, rectangular and hexagonal grades, rails, reinforcing steel and wire rod, as well as products of further redistribution – steel pipes, hardware, rolled products with coatings, etc. [13]. Most of the rolled products are intended for domestic consumption. Domestic using of metallurgical products in Ukraine is quite limited; in addition, there is a tendency to decrease [11].

The most important feature of modern national economic systems and the world economy in general is the accelerated growth of concentration of capital and production in various spheres of economic activity. The most obvious manifestation of large-scale concentration and centralization of capital is the creation of various forms of business groups [14]. Assessment of the corporate affiliation of MMC ferrous metallurgy enterprises showed that as a result of large-scale changes in management, up to 95% of enterprises of ore mining, coal mining, and coke, ferrous and nonferrous metallurgy of Ukraine actually became part of large transnational industrial and financial groups [13]. As FIGs were formed against the background of political, socio-economic permanent crises, the commodity and financial flows over which they exercised were concentrated in the spheres of foreign economic activity, which allowed business groups to avoid losses from changes in economic policy within the country. It is due to the difference between domestic and foreign economic conditions that their superprofits were created [14]. Today in the metallurgical industry of Ukraine there are ten largest and most influential business groups, which are at different stages of structuring and formalizing the business. These are such groups as: ISD, SCM, Smart Holding, Interpipe, Privat, Donetskstal, VS Energy International Ukraine, ArcelorMittal, Evraz, Mechel [13].

Timely assessment and reasonable interpretation of the challenges of the global metallurgical market are important conditions for providing trade policy makers with relevant information for resource mobilization at the national level [11]. Metal markets are formed under the influence of changes in world demand and supply for them, respectively; any changes in metal markets have an impact on the world economy [12]. Domestic metallurgical industry is an integral part of the world industry, its development takes place in the context of global trends, the leading of which is the constant growth of metal production against the excess of metal smelting over its consumption, radical change in geographical structure of production and use of metal products increasing the industry's ability to generate and implement innovations [1]. The global steel industry faces many obstacles, such as the volatility of raw materials and energy markets and the risks of protectionist policies. Scientific and technological progress, globalization of the economy and structural restructuring of the world economy have fundamentally changed the sectorial priorities of economic development. In industrialized countries, the absolute and relative demand for mass-produced metal products has significantly decreased. But the role of resource conservation increased and, in particular, metal conservation, which has become one of the basic principles of economic practice of all countries [14].

The main competitors of metallurgical enterprises of Ukraine in Europe are metallurgical plants in Germany, France, Italy, the Netherlands, Slovakia, and in the East – plants in China, India, Japan, and South Korea [6]. Over the past 10 years, steel production in China and India has doubled, indicating increased competition in the global metallurgical market. The 20 largest steel-producing countries together produce more than 90% of world production. There are also countries that do not produce metallurgical goods or do not produce enough to satisfy domestic needs, namely the countries of the

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Middle East, Africa, South and Central America [10]. In the United States, Germany, France, Italy, and the United Kingdom, due to the introduction of new technologies, the volumes of own steel production have decreased. At the same time, steel production in developing countries grew. This was preceded by the construction of metallurgical facilities mainly on a new technological basis and advanced production structure [14]. In March 2018, the US administration imposed an import duty on any metal products imported into the country. This led to a «chain reaction», protective measures against imported metal from the European Union, Turkey, and Russia [1]. This situation has led to growing uncertainty, reduced business willingness to invest, take risks, lower consumer expectations, which, in turn, has caused a slowdown in China's economic development and, consequently, falling demand for steel products. The deceleration in the development of mechanical engineering and construction has provoked a decrease in steel consumption in the EU – the main market for Ukrainian metal products, which supplies about a third of exports [10]. Thus, exports of Ukrainian metal products diminished, which led to a reduction in the large share of foreign exchange earnings in the country [1].

At the end of 2019 – beginning of 2020, the world market of ferrous metals for metal producers has a very favorable situation, which lasted until mid-March 2020. Due to long-term quarantine measures in most exporting countries, the work of metal processing enterprises was stopped, and the purchase of raw materials was limited indefinitely. Trade activity in the main export regions fell to the lowest levels, and export prices for finished metal products and some commodity prices reached their lowest level since 2016. And only from the middle of 2020 the general trade activity began to recover gradually [8]. In January-August 2021, the world produced 981.96 million tons of cast iron (911.87 million tons by blast furnace and 70.09 million tons by direct recovery). This is 5.5% more than in the same period of 2020. The first place in world cast iron production still belongs to the People's Republic of China, whose metallurgists smelted 605.38 million tons of this product in 8 months of 2021 (0.6% more than in January-August 2020). The share of Chinese cast iron in world production was 61.7%. The second place among world cast iron producers in January-August 2021 was taken by India (77.97 million tons; 22.5% more than in the same period in 2020), the third – Japan (47.04 million tons; 14.6% more). In January-August 2021, Ukraine ranked tenth among the world's 38 cast iron producers, smelting 14.48 million tons of these products during this period, 6.8% more than in January-August 2020. Among the 64 steel-producing countries in January-August 2021, Ukraine ranked fourteenth, smelting 14.59 million tons of steel, which is 6.6% more than in the same period in 2020 (Fig. 2) [7].

In domestic metallurgy, the trend of large-scale closure of production has become dominant [2]. The most serious test for the industry was the hostilities in Donetsk and Luhansk regions since 2014. The suspension or reduction of business activity of metallurgical enterprises in the temporarily uncontrolled territory of Ukraine has led to negative dynamics of steel production in the country [1]. Since 2014, Ukrainian metallurgical enterprises have also lost the Russian market, which has significantly reduced exports of many products and negatively affected the country's economy. Therefore, it was decided in 2015 to reorient to the markets of the EU, North Africa and the Middle East [13]. In 2017, Ukraine lost market share to China, but was able to gain market share in Japan, Serbia and South Korea [11]. The abolition of import duties to the EU on metal products boosted exports, which contributed to the growth of exports in 2018 by 35.9% compared to 2017 [11]. The metallurgical


| | China | India | Japan | Russia | Korea | NAFTA | Iran | Brazil | Germany | Ukraine |
|---|---|---|---|---|---|---|---|---|---|---|
| 2020 | 601843 | 63643 | 41060 | 39782 | 29466 | 20581 | 21553 | 15750 | 14264 | 13554 |
| 2021 | 605383 | 77973 | 47044 | 41318 | 31010 | 26151 | 23507 | 18860 | 16858 | 14481 |
| Growth rate | 0,59% | 22,52% | 14,57% | 3,86% | 5,24% | 27,06% | 9,07% | 19,75% | 18,19% | 6,84% |

Fig. 2 – Dynamics of cast iron production by leading countries in 2020–2021 (January-August) on the world metallurgical market

Source: developed by the author based on data [7]

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industry was able to restore gradually the growth trajectory and maintain one of the leading positions in the structure of national industry (Fig. 3) [2].

The general favorable situation in the main foreign markets and a fairly active recovery of domestic consumption in the fourth quarter of 2020 helped domestic metal producers to increase considerably production and increase exports by the end of the year, thus leaving the results of the year at the level of 2019 [8]. According to Ukrmetalurgprom, total in 2020 Ukrainian metallurgical plants produced more than 20.42 million tons of cast iron, 20.62 million tons of steel and 18.43 million tons of rolled steel. Compared to 2019, the production of cast iron increased by 1.8% and rolled steel – by 1.2%, while the production of steel decreased by 1.1% and pipes – by 15.8%. For the fourth year in a row, in the dynamics of development of Ukrainian metallurgy, the main indicators of ferrous metals production at leading metallurgical plants remain at the level of 2017 with small changes each year. The main export markets of Ukrainian metal products in January-December 2020, according to LLC COMPANY PSC-GRUP, are the countries of the European Union (28.5%), other Europe (14.5%) and Asia (14.2%). Among metallurgical importers for 12 months of 2020, the first place is occupied by the CIS (38.5%), the second by EU (24.5%), the third – Asian countries (20.5%) [9].

The situation on world markets is such that in Ukrainian metallurgy there is a real threat of losing markets. Therefore, the development of the domestic market of metal products today is one of the highest priorities of the industry [2]. The domestic market of Ukraine is characterized by ultra-low demand for metallurgical products compared to the volume of its production, which against the background of foreign economic conditions exacerbates the low-tech nature of production [14]. In 2020, the problems caused by the global coronavirus pandemic COVID-19 were added: declining business activity, further strengthening protectionism, breaking and shifting logistics chains, falling consumer incomes, closing borders among countries, etc. [11]. The largest consumers of metal products in the domestic market of Ukraine are directly the metallurgy itself (especially producers of pipes and hardware) and metal traders. These two segments together consume more than 55% of the metal supplied by domestic producers to the domestic market. At the same time, the share of such branches of the domestic economy as mechanical engineering, automobile construction and construction is rather low in the structure of domestic consumption of metal products. The revival of consumption in the domestic market was due to the recuperation of related industries, the main of which is the defense industry, represented by such enterprises as «Zoria-Mashproekt», «Zaporizhtransformator», etc. (Fig. 4) [1].

In general, in 2020, 5.46 million tons of metallurgical products were delivered to the domestic market, of which 4.19 million tons rolled metal were from domestic producers. Meanwhile, the share of imported metal in total deliveries in 2020 decreased to 23.3% against 28.03% in the same period last year [8].

Despite the favorable situation and attractive low prices in the first half of 2020 for metal products in foreign markets (China, Moldova, Russia and Belarus), imports of rolled metal products to Ukraine declined by 14.8% for the year. During this period, products were purchased mainly for own needs and in small batches. Also, to protect domestic producers and prevent the influx of cheap goods, antidumping measures continued to apply to certain types of rolled metal, which further helped to reduce imports of these goods to Ukraine [7]. In total, over 1.35 million tons of ferrous metals worth almost $1.16 billion were imported to Ukraine in 2020. Compared to the same period in 2019,

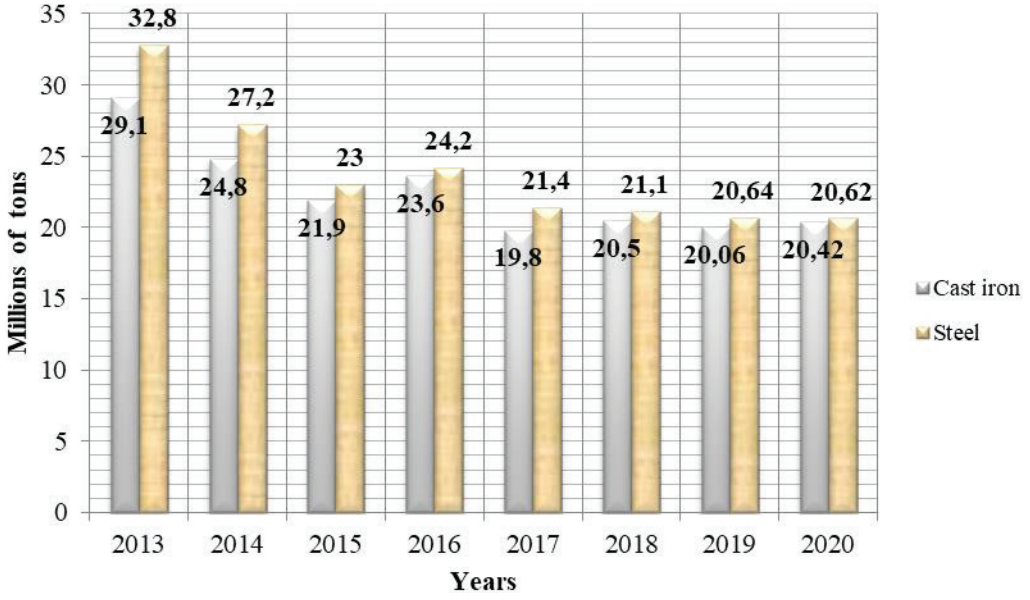


Fig. 3 – Dynamics of production of the main types of metallurgical products of Ukraine for the period from 2013 to 2020

Source: developed by the author based on data [1; 8]

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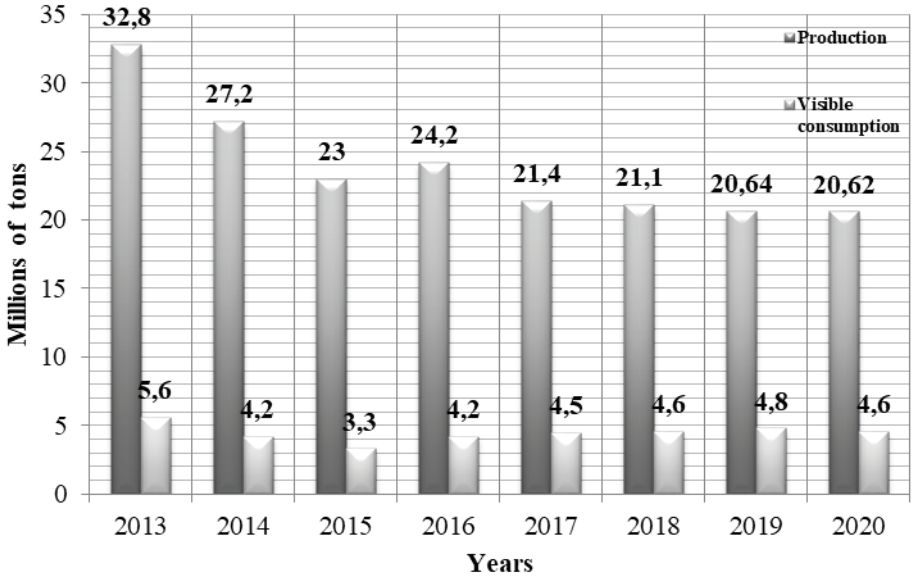


Fig. 4 – Dynamics of production and visible consumption of steel in the domestic market of metallurgy of Ukraine, 2013–2020

Source: developed by the author based on data [1; 8]

imports to Ukraine decreased by 15.9% in physical terms, while in value terms, imports fell by 19%. Metal products of European production are in constant demand on the Ukrainian market [8].

Ukrainian metallurgical enterprises face a wide range of problems, both external and internal:

– low quality of products, non-compliance with international standards, which leads to a low level of competitiveness in the global metallurgical market [1];

– strengthening competition in traditional export markets in connection with the establishment of trade defense measures;

– reinforcing the influence of the countries of the Asian region on world markets for metal products;

– insufficiently high level of protection of the domestic market;

– unsatisfactory demand for metal products in the domestic market because of its low capacity [6];

– dependence of the efficiency of Ukrainian metallurgical enterprises on the world market situation, which is combined with the weakness of the domestic market [5];

– lack of innovative changes, decline of branch science and inefficiency of mechanisms of attraction of potential of academic institutes for performance of applied developments;

– high degree of depreciation of fixed assets (up to 70–80%);

– reduction of foreign investment in the industry;

– inefficient use of production capacity;

– insufficient level of budget funding;

– growing environmental problems, especially in regions where the metallurgical industry is dominant [13];

– availability of excess capacity;

– underdeveloped logistics system, which does not allow to move to other markets and slows down the system of transportation of products in Ukraine [10];

– low level of cooperation in the mining and metallurgical complex, which does not permit to establish rational channels of resource provision of metallurgical enterprises and to create full technological cycles of production [14].

Solving these problems requires a comprehensive program of informed decisions, the main of which should be the formation of an equilibrium model of the domestic metallurgical market, taking into account its potential. The export-oriented model of development of the metallurgical industry has both advantages and disadvantages. On the one hand, the export of the metallurgical industry is the main source of income for Ukrainian industry. On the other hand, the focus on foreign markets makes the industry extremely sensitive to fluctuations in the economies of importing countries. A strategically correct solution would be to reduce the economy's dependence on metal exports. However, the consumption of metal products in the domestic market also tends to decrease, especially in recent years [2]. The domestic market of metal products can be significantly expanded due to the large-scale restoration of the domestic metal fund, more than half of which is now in a dilapidated condition. Also, more than 60% of domestic heating networks that operate beyond the standard service life require immediate replacement. This is especially true of infrastructure facilities in both the industrial and social spheres, as well as mechanical engineering as the basis for the country's innovative development. A certain increase in demand for domestically produced metal products can be provided by agriculture, woodworking industry, road construction, small mechanization of life, the service sector, etc. [5].

The European market remains relevant for Ukraine, where half of Ukrainian iron ore exports go. In the near future, the European direction will remain attractive, given the small transport distances [2]. Under conditions of the intensification of competition in the world market of ferrous metals, it is

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extremely important for Ukrainian metallurgists to develop not only new geographic markets, but also new product markets in regions where Ukrainian products are already present. One of such quite promising markets, according to some experts, is the European market of foundry products (casting). A number of experts also believe that Ukrainian metallurgical companies should move from the sale of semi-finished products and raw materials to the export of metal products with a high share of value added [3]. The real demand for domestic metal products will largely depend on the state, trends and priorities of the industry in both Ukraine and the European Union. To maintain and expand Ukraine's presence in the European market, coordinated actions of the state, business and science are needed, the priority of which should be modernization of production with an emphasis on reducing its energy and resource consumption and increasing environmental friendliness and stimulating the rise of the domestic market of metal products where Ukrainian innovative developments would be tested. This will ensure a competitive price / quality ratio for domestic metal products, help to reduce the industry's dependence on exports and allow building business relationships with European partners on an equal footing [14].

In order for the proposed improvements to have a positive result, the Ukrainian metallurgical industry needs to implement the following measures:

– priority development of the domestic market of metal products, which will ensure more stable sales of manufactured products and reduce dependence on fluctuations in world conditions;

– intensification of realization and implementation of innovative developments to create fundamentally new technical and technological metallurgical solutions, increase production of deep processing products and design its new types, improve the quality and competitiveness of metal products, reduce its resource intensity [1];

– diversification of production and optimization of its structure by increasing the range of new products;

– innovative improvement of equipment and technology of metal production, diminishing of harmful effects of industry on the environment [5];

– training of new generation specialists, who will be distinguished by the highest level of digital culture, will be able to deeply combine and comprehensively apply modern digital technologies in real production and will be ready for continuous learning;

– public-private partnership that will help determine the strategic framework goals and objectives of the industry, improve the institutional environment of production with science and investors, solve the problem of volume and priority areas of funding and state support for scientific, technological and socio-economic changes in metallurgy of the future [1];

– creation of favorable economic conditions for accelerated renewal and modernization of fixed assets in order to increase energy efficiency, especially in the metallurgical industry and the competitiveness of its products;

– constant coordination of development of plans of metallurgical enterprises with strategies of other industries of Ukraine;

– use of all available opportunities of state influence by developing and implementing a legislative framework aimed at creating advantageous conditions for the development of the domestic market of metal products and satisfying the needs of Ukraine's own metal products;

– formation of effective and efficient support of scientific and technical potential of the country, fundamental and applied research aimed at ensuring innovative development [5].

## Conclusions from this study and prospects for further exploration in this direction

Thus, a study of the advantages and disadvantages of the development and functioning of the domestic metallurgical market found that a characteristic feature of its activities is export-oriented, which dictates pricing rules and determines the dependence on global trends and world prices for leading sectors of the economy. Therefore, to increase the efficiency of the domestic metallurgical market, the urgent task, which must be resolved at the national level, is the structural reorganization and maintenance of advanced development trends on the basis of innovative modernization. Excessive enthusiasm for the export-oriented model of development turned into a strategic loss for Ukrainian metallurgy, creating for it «traps» of economic prosperity with overall low competitiveness, growing resource and energy dependence, imports of quality metal products for a few high-tech industries. The adequacy of the responses of industry and government to these challenges will have a decisive impact on the development of metallurgy in the short and long term. A new strategy for the development of the industry should be formed on the priorities of the concept of neo-industrialization of the national economy. Its basis is own resources, new technologies, active domestic demand.

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# UKRAINE'S FOREIGN TRADE ACTIVITY: CURRENT SITUATION, RISKS AND PROBLEMS

**Koloberdyanko I.I., Rudnik O.R.**
*Zaporizhia National University*
*Ukraine, 69600, Zaporozhye, street Zhukovsky, 66*
koloberdjanko@ukr.net, rudnik20032001@gmail.com

**Key words:**
foreign trade, export, import, international business, foreign markets, economic and social risks

The article considers Ukraine's foreign trade relations with foreign countries, in particular, with the countries of the European Union. The analysis is carried out on the basis of comparison of volumes of export-import operations and by the analysis of commodity filling of the international markets. The article traces the trend of changes in the world trade space in recent years, which is due to a number of specific reasons, including: scientific and technological progress, integration and globalization, the formation of modern personality and society as a whole. The authors note the main advantages of the openness of Ukraine's economy and its active cooperation with foreign countries. This highlights the main risks associated with international trade and draws a parallel between them and the social-economic life of the state. Based on the characteristics of the impact of foreign trade on society, the article describes the principles of foreign trade and analyzes the methods of conducting foreign business. Emphasis is placed on the obstacles that arise in the process of Ukrainian business entering foreign markets. The article pays special attention to the analysis of Ukraine's trade relations with the EU countries, first of all, to the clarification of the expected risks and prospects for their further development. At the same time, the authors trace their positive and negative impact on the economic situation in Ukraine. Statistics on the competitiveness of Ukraine's economy in relations with foreign trade partners are widely presented. Based on the research, the authors suggested ways to improve Ukraine's trade relations with foreign countries and strengthening its competitive position.

# ЗОВНІШНЬОТОРГОВЕЛЬНА ДІЯЛЬНІСТЬ УКРАЇНИ: СУЧАСНИЙ СТАН, РИЗИКИ ТА ПРОБЛЕМИ

**Колобердянко І.І., Руднік О.Р.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
зовнішня торгівля, експорт, імпорт, міжнародний бізнес, зарубіжні ринки, економічні та соціальні ризики

У статті розглядаються зовнішньоторговельні відносини України з зарубіжними країнами, зокрема, з країнами Європейського союзу. Аналіз здійснюється на основі порівняння обсягів експортно-імпортних операцій та шляхом аналізу товарного наповнення міжнародних ринків. У статті простежується тенденція змін у світовому просторі торгівлі за останні роки, яка обумовлена низкою певних причин, серед яких: науково технічний прогрес, інтеграція та глобалізація, становлення сучасної особистості та суспільства в цілому. Авторами зазначаються основні переваги відкритості економіки України та її активного співробітництва із зарубіжними країнами. При цьому виокремлюються головні ризики, пов'язані із міжнародною торгівлею та проведено паралель між ними та соціально-економічним життям держави. Виходячи з наведеної характеристики напрямів впливу зовнішньої торгівлі на суспільство, в статті охарактеризовано принципи зовнішньої торгівлі та проведено аналіз методів ведення зарубіжного бізнесу. Акцентується увага на перешкодах, які виникають в процесі виходу українського бізнесу на зарубіжні ринки. У статті особливе місце надано аналізу торговельних відносин України з країнами ЄС, насамперед, з'ясуванню очікуваних ризиків та перспектив їх подальшого розвитку. При цьому, авторами простежується позитивний та негативний їх вплив на економічну ситуацію в України. Досить широко представлені статистичні дані щодо конкурентоспроможності економіки України у стосунках з зовнішньоторговельними партнерами. На основі проведених досліджень, авторами запропоновано шляхи покращення торговельних відносин України із іноземними країнами та зміцнення її конкурентних позицій.

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### Formulation of the problem

The modern world is under the influence of large-scale processes of integration, globalization and scientific and technological progress, which affects the development of society and the emergence of new needs and opportunities. Therefore, the most important task is to develop with the environment, to follow latest trends in the economic and social sphere. New needs of society cause changes in the field of foreign trade, require the formation of new ties with partner countries. In this aspect of events, it is necessary to take into account all the risks and problems that may arise in the process of cooperation with the outside world, which makes the study of this topic relevant.

### Analysis of recent research and publications

The problem of Ukraine's foreign trade and cooperation with foreign countries, as well as current trends and prospects for trade relations have been studied by many Ukrainian scientists, including scientists such as Savitsky A.V. [1], who considered Ukraine's foreign trade in macroeconomic instability; Kolyada O.V. [2], Omelchenko M.M. [2], who studied the foreign trade in goods of Ukraine; attention to the analysis of Ukraine's foreign trade activity and opportunities for its improvement Bogatska N.M. [4]; Artamonova G.V. [2] explored opportunities and challenges for foreign trade, Tereshchuk G.S. [6] analyzed the positive consequences and benefits of Ukraine's accession to the World Trade Organization, Pyankova O.V., Ralko O.S. [7] paid attention to the issues of structural changes and priorities of Ukraine's foreign trade. At this stage, world trade requires further analysis, especially in the light of the recent challenges of the COVID – 19 pandemic.

### Formulation of goals

The purpose of the article is to characterize the current state of foreign trade, taking into account the changes taking place in the economy due to scientific and technological progress; study of current risks and problems related to Ukraine's trade relations with partner countries, as well as – the main proposals for improving foreign trade relations.

### Summary of the main research material

At the present stage of economic development of Ukraine there are a number of conditions for foreign trade. These include increasing the scale of production, the transition to a new technological method of manufacturing, rapid spread of high scientific technologies that eliminate barriers to the movement of goods, services and capital, knowledge as a result of intellectual exchange contribute to the formation of new, promising links with other countries.

The formation of a new society is gradually taking place: greater needs arise, modern principles appear, new customs are introduced. This is due to the high rate of development of states, which is the result of globalization and is accompanied by an increase in the number of producers, international division of labor, specialization and cooperation in many areas of production, cultural integration.

Every year the competition between the countries of the world grows more and more. This is due to the high rate of development of states, which is the result of industrialization and is accompanied by an increase in the number of producers, international division of labor, specialization and cooperation in many areas of production.

In order to be able to compete in the European market of goods and services, or to be competitive, each state must be different from all its infrastructure, which includes: production, social security (health care, education), engineering and technical support, scientific-technical progress, transport, tourism. The world market of goods and services cannot exist without a production and consumer base. It is the basis of market relations [2].

The following factors should contribute to strengthening the competitiveness of an individual country: education, labor market efficiency, development of the market of goods and services, development of the financial market, scientific and technical innovations.

When considering the issue of foreign trade between Ukraine and the EU, it is necessary to focus on the factor of innovative progress and development of the market of goods and services. Simultaneously with the introduction of the latest technologies in the production process, the export opportunities of the state are expanding. At present, the basic structure of Ukraine's exports is presented in Figure 1.

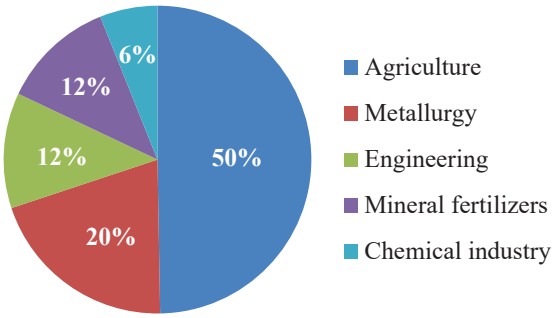


Fig. 1 – Structure of Ukrainian exports

Source: [4]

According to the state website of Ukraine's foreign trade activities, exports of goods to the EU in 2020 amounted to 37.8% of total exports to other countries ($18,612.1 million). According to the results of the analysis of Ukraine's foreign trade activity, it should be noted that the European Union remains the main partner of Ukraine's foreign trade relations. In modern conditions, preference is given not only to trade in material products, but also to intellectual property products, namely: the experience of leading experts, scientific developments of Ukrainian researchers, IT services, educational services.

The current state of foreign trade between Ukraine and the EU is related to the development of the transport system. Regarding transport connections, Ukraine must take into account the European standards of the transport system, the level of transport safety, modernization of transport rolling stock, the creation of a joint air connection between Ukraine and the EU. In this regard, the European Union has adopted the program «Trans – European transport network policy».

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A free trade area has been established between Ukraine and the European Union to freely exchange goods and services. The essence of the formation of this space is characterized by:

– no need for additional product certification in the EU (because product quality is based on European standards);

– abolition of import duties on most imported goods;

– creating favorable conditions for access to markets for goods and services;

– prevention of fraud, smuggling and other trade offenses;

– strengthening the protection of intellectual property rights.

We want to focus on agricultural exports to EU countries, namely its development from 2014 to 2020, which is listed in Table 1.

As of 2021, 333 agro-industrial enterprises in Ukraine have the opportunity to sell their products on European markets. Today we have the following volumes of trade between Ukraine and European countries: live animals and products of animal origin ($209850.2 thousand), products of plant origin ($2246187.1 thousand), fats and oils (1336427, $8 thousand million), finished food products ($653389.4 thousand).

Despite the diversity of Ukraine's export opportunities, domestic producers face a number of problems in conducting trade relations with the EU. These problems are manifested in insufficient amounts of accumulated capital of domestic producers, which limits the ability to purchase the necessary raw materials and quality products, the predominance of goods with low processing, low competitiveness of producers (non-compliance with European quality standards) and protection of intellectual property rights. As for the requirements for Ukrainian products, it is necessary to comply with European standards, including: sanitary standards, certification, environmental requirements.

Equally relevant today is the problem of adaptation of domestic producers to modern market conditions, which is manifested in poor awareness of supply and demand in foreign trade, low rates of introduction of scientific and technological progress in production and difficulties in gaining the trust of European partners.

As we see, the expansion of the trade market through accession to the European Union is a challenge for Ukraine. The experience of expanding the trade market has shown not only positive aspects, but also caused a number of challenges for countries. We propose to consider the following examples in table 2.

International trade is always influenced by external and internal factors, due to numerous imbalances in the process of trade relations between countries. Foreign trade relations were particularly affected during the 2020 pandemic. Thus, in the international market we observe the following situation:

– Foreign trade turnover of goods and services with EU countries in 2020 decreased by 9% and amounted to $48.1 billion;

– Exports decreased by 9.4% ($21.9 billion);

– Imports decreased by 8.7% ($26.3 billion).

Today, due to the COVID-19 pandemic, Ukraine has problems with conducting foreign trade activities. First, the volume of domestic exports and imports directly depends on the epidemiological situation; secondly, based on the new problems of trade, an extremely difficult task is to build forecasts of supply and demand in the market of goods and services; and thirdly, there is a rapid change in consumer needs, which complicates trade with foreign countries.

If we consider the events of 2019–2020, it can be argued that it was then that Ukraine's foreign trade was negatively affected by the crown-virus pandemic. According to the latest data of the World Trade Organization, the decline in foreign trade in goods and services was 18.5%. Ukraine's imports were in a critical situation, falling by 14.3%. Figure 2 shows the main products of Ukrainian exports in 2020.

Table 1 – Ukraine's agricultural exports to the European Union

| Year | Direction of agricultural export development |
|---|---|
| 2014 | Active development of poultry meat exports to EU countries |
| 2015 | Ukraine received a permit to export milk and dairy products to the EU market |
| 2016 | Dissemination of quality standards for plant products |
| 2017 | Development of crop exports |
| 2018 | Development of exports of finished food products |
| 2019 | Exchange of technologies, new methods of conducting agrarian business, dissemination of scientific and technological progress in the field of agricultural production |
| 2020 | Introduction to the structure of exports of eco - products |

Source: compiled by authors from [6]

Table 2 – Challenges for foreign trade upon accession to the EU

| Country | Consequence of EU accession |
|---|---|
| Lithuania | Has lost a significant number of power plants, which has limited its competitive opportunities in the electricity market |
| Latvia | The decline of the sugar industry. Reduction of sugar exports |
| Estonia | Loss of export opportunities in the field of mechanical engineering |
| Poland | The coal industry lost 90%. Reduction of coal exports |
| Hungary | has lost the opportunity to sell its own buses |

Source: compiled by authors from [5]

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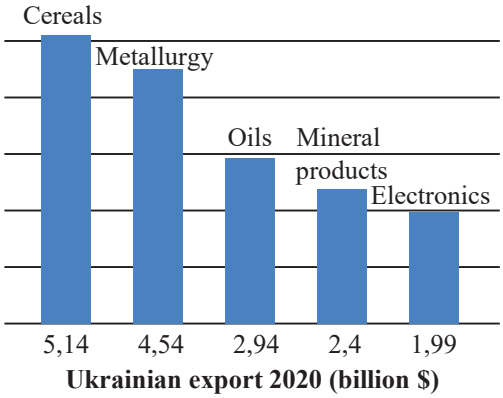


Fig. 2 – The main goods of Ukrainian exports in 2020
Source: compiled by authors from [8]

The leaders of Ukrainian imports are presented in Figure 3.

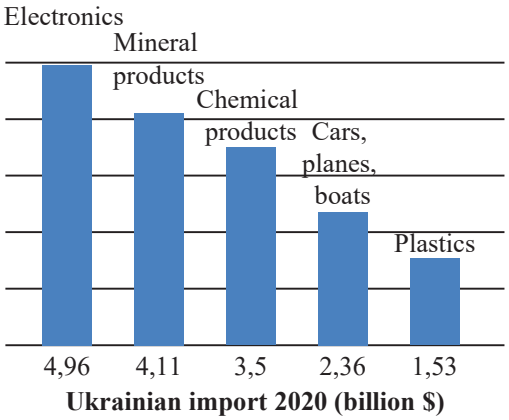


Fig. 3 – Leaders of Ukrainian imports in 2020
Source: compiled by authors from [8]

In 2020, the volume of trade with Ukraine's main partners changed slightly. We can present the main countries that import goods from Ukraine and indicators of their imports

- China (+92.7% – $3 billion)
- Poland (– 13.9% – 1.45 billion dollars)
- Russia (– 16.7% – 1.32 billion dollars)
- Turkey (– 10.8% – $1.17 billion)
- Egypt (– 18.1% – 0.97 billion dollars)

It is worth noting the decline in Ukrainian imports:

- China (– 7.2% – 3.64 billion dollars)
- Germany (– 16.7% – $2.47 billion)
- Russia (– 42.6% – $2.19 billion)
- Poland (– 8.2% – 1.72 billion dollars)
- USA (– 4.1% – 1.49 billion dollars)

Basing on the above statements, we can make several proposals how to improve the development of Ukraine's foreign trade with foreign countries:

– Improving the conditions of domestic production, increasing the competitiveness of domestic products by introducing into the production process the latest achievements of scientific and technological progress, expanding the information space of Ukrainian entrepreneurs on trade offers abroad;

– Increasing cooperation between domestic and foreign producers;

– Organization of presentations of products of domestic origin abroad;

– Compliance with quality standards of goods and services;

– Detailed analysis of the consumer base taking into account new trends;

– Increasing the scale of production of eco – products, reducing the material consumption of products, efficient use of resources.

Following the submitted proposals, Ukraine will be able to take a competitive position in the foreign trade space and be a priority for foreign consumers.

## Conclusions

The results of the analysis show that international trade is always under the influence of external and internal factors, due to numerous imbalances in the process of trade relations between countries. At present, the global problem in the foreign trade relations of the states is the pandemic COVID – 19, which causes barriers to the export and import of goods and services. No less relevant today is the problem of adaptation of domestic producers to modern market conditions, which is manifested in a weak awareness of supply and demand in foreign trade. To improve trade with the world, Ukraine should focus on current trends in society and support domestic producers, which will make Ukrainian goods and services competitive in the world market and take a prominent place among foreign consumers.

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# DIVERSIFICATION OF INTERNATIONAL TRADE: PROBLEMS OF THEORY

**Lubenets I.O.**
*Zaporizhzhya National University*
*Ukraine, 69600, Zaporizhzhya, Zhukovsky str., 66*
lubenec@ukr.net
ORCID: 0000-0002-4495-5947

**Key words:**
vertical diversification, horizontal diversification, foreign trade diversification, export, import, competitive advantage, international trade, commodity diversification

Dynamic development of the modern world economy, its globalization and internationalization have stipulated for the structuring of international trade. This leads to the necessity to increase competitiveness of countries, realization of their competitive advantages. An effective method of solving this problem is the diversification of a country's foreign trade. This method allows to reduce external risks and significantly increase the country's competitiveness in the world market. However, despite the fact that researchers of theoretical foundations of diversification have performed a lot of work, the question of determining the nature of international trade and economic relations diversification has not been studied enough, and therefore requires further analysis. Three main approaches may be distinguished while analyzing the concept of "international trade diversification": diversification as risk reduction, diversification as a marketing strategy and as a process of expanding the range of goods and services to optimize the industry structure. Diversification may be accomplished at the corporate, national and interstate levels. Diversification of international trade is carried out through the diversification of exports and imports by commodity flows structure and geographical structure. Vertical diversification shifts in the country's foreign trade are used to minimize the risks of significant price fluctuations in the world market of raw materials, as well as to form the preconditions and intensify economic development based on exports of high value-added products. Horizontal diversification involves the manufacturing of new products that are not technologically related to existing ones and are intended for existing customers of the enterprise. All this is happening within one sector of the country's economy. Therefore, the state policy of diversification of foreign economic sphere is to create and implement conditions for optimizing the sectoral and geographical structure of foreign trade flows, reducing dependence on world markets and ensuring efficient trade turnover in foreign economic relations. It provides for a gradual transition from raw material exports to high-tech, changes in the structure of imports – reducing the share of household goods and increasing the share of high-tech equipment. Such diversification determines the direction of economic development towards increasing the efficiency of the economy.

# ДИВЕРСИФІКАЦІЯ МІЖНАРОДНОЇ ТОРГІВЛІ: ПРОБЛЕМИ ТЕОРІЇ

**Лубенець І.О.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
вертикальна диверсифікація, горизонтальна диверсифікація, диверсифікація зовнішньої торгівлі, експорт, імпорт, конкурентні переваги, міжнародна торгівля, товарна диверсифікація

Динамічний розвиток сучасної світової економіки, її глобалізація та інтернаціоналізація зумовили структуризацію міжнародної торгівлі. Це призводить до необхідності підвищення конкурентоспроможності країн, реалізацію їх конкурентних переваг. Ефективним методом вирішення цієї проблеми є диверсифікація зовнішньої торгівлі країни. Цей спосіб дозволяє знизити ризики зовнішнього середовища та суттєво підвищити конкурентоспроможності країни на світовому ринку. Однак, не зважаючи на те, що дослідниками теоретичних основ диверсифікації була виконана величезна робота, питання визначення сутності диверсифікації міжнародних торговельно-економічних відносин досліджено ще недостатньо, і тому потребує додаткового аналізу. Аналізуючи поняття «диверсифікації міжнародної торгівлі» можна виділити три головні підходи: диверсифікація

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як зменшення ризику, диверсифікація як маркетингова стратегія та як процес розширення асортименту товарів та послуг для оптимізації галузевої структури. Диверсифікація може здійснюватись на корпоративному, національному та міждержавному рівнях. Вона здійснюється за рахунок диверсифікації експорту та диверсифікації імпорту за товарною структурою потоків та географічною структурою. Вертикальні диверсифікаційні зрушення у зовнішньоторговельній сфері країни застосовуються для мінімізації ризиків від істотних цінових коливань на світовому ринку сировини, а також для формування передумов і активізації економічного розвитку на основі експорту продукції з високою доданою вартістю. Горизонтальна диверсифікація передбачає випуск підприємством нових товарів, які технологічно не пов'язані з існуючими і призначені для існуючих клієнтів підприємства. Все це відбувається в межах одного сектору економіки країни. Тому державна політика диверсифікації зовнішньоекономічної сфери полягає у формуванні та реалізації умов для оптимізації галузево-географічної структури зовнішньо-торговельних потоків, зниження залежності від кон'юнктури світових ринків та забезпечення ефективного товарообміну в системі зовнішньоекономічних відносин. Вона передбачає поступовий перехід від сировинного експорту до високотехнологічного, зміни структури імпорту – зменьшення частки товарів побутового призначення і збільшення частки високотехнологічного устаткування. Така дивесифікація визначає напрямок розвитку економіки – зростання ефективності економіки.

**Statement of the problem**

The dynamics of modern world economy development and its globalization, increasing the level of internationalization of enterprises, accelerating the pace of scientific and technological progress have led to the structuring of international trade. This aggravates the problems of competitiveness increasing between countries, implementation of their competitive advantages. An effective method to solve these problems in the foreign economic sphere is to diversify a country's foreign trade as a way to reduce external risks and increase its competitiveness in the world market.

**Analysis of recent studies and publications**

Theoretical foundations of diversification have been considered in the works of such foreign scientists as Ansoff I., Akkoff R., Aronova O. M, Bowman K., Galbraith J.K., Dichtl E., Drucker P.F., Kotler F., Porter M.E, Santo B., Strickland A.J., Thompson A., Young S.

It should be noted that the diversification of foreign trade as a separate type of diversification has been studied by foreign scholars relatively recently. Problems of export diversification were considered by such foreign scientists as M. Ainal Hassan, Hirohita Toda, G. Daniele, F. Bonagli, K. Yudayev, A. Golikov, R. Mshlumyan, G. Goldstein, and others.

These concepts were further developed in the works of such domestic scientists as Borisova V.A, Butenko N.V., Grishko V.A., Demchenko G.L., Ilyashenko S.M., Koretsky M.Kh., Kudenko N.V., Melnyk L.G., Nemtsov V.D., Oborskaya S.V., Olefypenko O.M., Breaks P.G., and others.

However, despite the fact that a lot of work has been done by these scientists, the question of determining the nature of the international trade and economic relations diversification is still not completely investigated, and therefore these issues need further analysis.

**Objectives of the article**

The objective of the research is to determine the essence of the «diversification» category, analysis and improvement of theoretical and methodological principles of forming the conceptual foundations of foreign trade policy diversification in countries with low development level.

**The main material of the research**

International trade is known as one of the main drivers of economic development and a sphere of international economic relations in contemporary economic environment. It envisages free exchange of goods and services between economic entities of different states, between states and international organizations.

International trade may be considered as a special type of social relations that arise in the world economy in the process of exchange of goods and services between states.

There are the following forms of international trade:

- fuel trade;
- machinery and equipment;
- food trade;
- trade in semi-finished products;
- trade in raw materials;
- trade in services;
- trade in intellectual labor products.

Methods of implementing the relationship between partners:

- direct trade – middlemen services are not used;
- trade through middlemen.

If a country participates in international trade, such participation takes the form of foreign trade. That is, foreign trade is a country's trade with other countries based on the international division of labor. Foreign trade promotes to establish balance in the country's commodity markets. It also allows us to focus on the production of those goods

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for which the country has lower costs than other countries, i. e. allows the country to use its resources more efficiently.

But foreign trade can also have negative consequences. If the value of imported goods exceeds the value of exported goods, a trade deficit is formed, which reduces the welfare of citizens.

Diversification of foreign trade becomes relevant to eliminate the balance of payments deficit and such negative phenomena as disproportional development of economic sectors, reducing the level of scientific and technological progress, retarding of economic growth, increasing of external debt level.

The term «diversification» comes from the Latin words «diversus» – different and «facere» – to do, and in the scientific literature the term has been used in the West since the mid-50s of the last century [1, p. 11].

To date, we can't give an unambiguous definition to the term «diversification».

Foreign and domestic scholars have different views on the interpretation of the term «diversification». There are three main approaches to this concept defining:

- as a way to reduce potential business threats;
- as the market behavior of a firm;
- as a process of expanding the range of goods and services to optimize the industry structure.

According to the first approach, diversification is interpreted by E. Chetyrkin, D. Stefanych [2], B. Reisberg, N. Wall. Thus, Chetyrkin defines it as «a common means of reducing any type of risk» [3, p. 169].

And Canadian economist D. Goldfarb uses the modern theory of portfolio choice to explain the reasons for the diversification of Canadian exports, according to which the diversification of a particular block of shares helps to distribute risks between countries, currencies and markets [4, p. 3].

The second approach is supported by such scientists as V. Konoplytsky, T. Ryabova, K. Bowman [5, p. 169], E. Krasnonosova [6, p. 157], A. Zub, O. Povolotska. Thus, V. Konoplytsky defines the concept of «diversification» as a marketing strategy «aimed at new activities of the firm outside the core business» [7, p. 70]. Such behavior of the enterprise occurs when it finds attractive opportunities outside its business [8].

According to the third approach, diversification is interpreted by V. Gabalis [9, p. 214], K. Pass [10, p. 108], A. Ambartsumov [11, p. 73], Z. Grushak [12, p. 6], Yu. Shakurova [13, p. 3] and others. Thus, Lozovsky defines diversification as «expanding the range, changing the type of products manufactured by the enterprise, firm, mastering new types of production to improve production efficiency, economic benefits, prevent bankruptcy» [14, p. 21].

And R. Ali and J. Alvan interpret the term «diversification» in a foreign trade context. By diversification they mean a change in the structure of the basket of export products or [list of] countries … of export supply [15, p. 7].

J. Bertelemi and S. Chauvin considered diversification as the expansion of production and exports by sectors of the economy [16, p. 10]. M. Agozin and R. Alvarez define diversification as a change in the structure of foreign trade flows by changing the existing export/import basket of goods and services, or through the modernization of products in existing foreign trade flows [17, p. 2]. And A. Dennis and B. Shepherd understand it as an expansion of the range of products supplied to foreign markets [18, p. 5].

Based on the above definitions of «diversification», we can define it for foreign trade as a strategy for economic development of a country, carried out by expanding the range of goods and services, expanding their quality and geographical vectors of export-import activities at the national level in order to minimize the negative impact on the internal environment.

Diversification of foreign trade can be distinguished at both micro- and macrolevels.

Trade diversification at the microlevel is carried out by individual enterprises. The company independently selects partners in both exports and imports. Diversification of exports is carried out to reduce risks and to expand the network of markets for sale of products and is also related to the assortment of products. The company is looking for the best option for selling different products in different countries.

Diversification of foreign trade of a particular country [19, p. 9] is already considered at the macroeconomic level. At this level it will depend on the functioning of open national economies and the world economy as a whole in the context of global financial markets [20, p. 39]. It is conducted by the government and involves various government programs and activities. These programs can be both general and sectoral.

At the interstate level, diversification is carried out with the consent of the governments of the partner countries. If countries join a union, they jointly diversify with the help of governing bodies. Such diversification is known as supranational.

It is necessary to distinguish the direction and the structure of trade flows in diversification of international trade.

Diversification in the direction of trade flows involves measures to improve the situation in export and import activities to avoid different types of risks.

Diversification of international trade by the structure of trade flows is divided into commodity and geographical.

The commodity structure of international trade is formed under the influence of competitive advantages that the country possesses, and they, in turn, depend on two groups of factors.

The first group includes natural factors. These include climate, the presence of minerals, soil fertility, and so on. The second group includes socio-economic factors. These factors characterize the scientific, technical and economic level of development of the country. They determine the competitive advantages that have been gained in the process of economic development [21; 22].

Commodity diversification can take the following forms:

- vertical diversification;
- horizontal diversification;
- conglomerate diversification;
- cross-diversification;
- mixed diversification.

ISSN Print 2414-0287
ISSN Online 2707-8426

The essence of vertical diversification is that a company begins to produce new products that are related to existing products in technological and marketing aspects. That is, it involves the transition between sectors of the economy (for example, from raw materials to industrial).

This type of diversification is associated with the creation of technological chains «extraction and processing of raw materials – production of intermediate products – manufacturing of products with high consumer properties – sale» both in full and in reduced form without links [20, p. 10].

Vertical diversification can expand market opportunities and promote growth, as processed goods in general have greater price stability than raw materials [23, p. 32–33].

Vertical diversification requires more skilled workforce, technological, managerial and marketing skills. In addition, vertical diversification may be associated with higher costs for training, which, in turn, can lead to greater external dynamic effects than horizontal diversification [24, p. 36].

Vertical diversification has the following advantages:

• combines coordination of actions with great opportunities at the enterprise level;

• guaranteed supplies of material and technical resources;

• closer contact with end users.

Disadvantages of vertical diversification:

• in case of negative external changes, the interdependence between the company's divisions may worsen the situation of the company;

• the market is limited to units of an enterprise, which destroys the positive influence of market forces and thus eliminates the need for improvement and development.

Today there is a tendency to reduce the level of vertical diversification.

Horizontal diversification involves manufacturing of new products that are not technologically related to existing ones and are intended for existing customers of the enterprise. All this is happening within one sector of the country's economy.

If we talk about the foreign economic sphere, such a restructuring of exports by expanding the production of relatively new goods, compared with the existing range of export supplies, leads to the mitigation of the negative impact of world markets. Export expansion policy is applied.

The advantages of horizontal diversification are that it allows to take into account the needs of consumers in a particular market.

When applying horizontal diversification, the risk is that the market may suddenly decrease, and the company, covering this market as a whole, will be faced with the need to change radically the direction of its activities.

Conglomerate diversification means production of new goods that are not related to the existing activities of the enterprise or its markets. And the growth of the country's economy is then carried out through the manufacturing of products that are not related to traditional products [20, p. 10]. Such diversification requires the greatest financial costs and can only be achieved by big enterprises [25].

Cross-diversification is a combination of horizontal and vertical diversification.

Mixed diversification means a combination of horizontal, vertical and conglomerate diversification [20, p. 10].

The following types of diversification are distinguished by industry affiliation [20, p. 11]:

• mono-industrial – within one industry;

• multi-industrial (related) – within several industries with traditional products;

• multi-industrial (not related) – within several industries, not related to traditional products.

Geographical diversification may be distinguished among the types of foreign trade diversification. It is defined as distribution of export and import flows between different countries of the world to balance trade between them and avoid the risks of large-scale trade with one or limited number of countries.

If we consider separately the concept of export diversification, it is an increase in the number of products and services types and names intended for export. It provides for a set of measures to improve export performance, creates conditions for overcoming negative external and internal influences on the economy, forms the optimal structure of goods, expanding its range, gradually increasing the share of high-tech products and goods with a high degree of processing. In addition, manufacturers and exporters are exploring new markets for goods, technology, capital and services. Such diversification is the most necessary for countries that depend on the raw materials sector.

Diversification of exports can have a positive impact on economic growth due to the positive effects on the manufacturing sectors. Thus, countries with diversified structure of exports gain benefits for capital formation and as a result higher rates of economic growth [26].

Diversification of imports involves a set of measures aimed at avoiding the risks of imperfect structure of goods and services supply, reducing dependence on imports of raw materials, expanding sources of supply and creating import-substituting industries based on advanced technologies.

It should be noted that imported diagonal diversification is an important mechanism for attracting foreign technologies: innovative equipment, units, machinery and equipment.

Such a development is possible if the implementation of diversification in foreign trade is accomplished according to the theory of competitive advantages by M. Porter. He emphasizes that this is possible with the formation of groups of interconnected companies (clusters), which are geographical neighbors that operate in a particular area and complement each other. M. Porter saw the role of the state in creating conditions for coordination and stimulating the activities of enterprises to form clusters [27; 20, c. 638].

Diversification of foreign trade can be traced in the theory of the U-curve, proposed by J. Imbs and R. Waszarg. According to their theory, each country passes through two stages in its development: increasing the level of export diversification in the transition from growth based on exports of raw materials to growth based on processing

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industrial products, which eventually acquires the most competitive advantages in the world market [28; 19, c. 83].

The expediency of diversification transformations and gaining benefits from international specialization depend on the level of development of the country's economic potential.

In order to develop the directions of diversification policy, the country is faced with the need for such a choice, which would be the most profitable.

The general objectives for all types of diversification are:

• consolidation of investment resources;

• reduction of risks associated with the external environment;

• ensuring social and economic stability, preventing economic crises;

• efficient use of all types of resources;

• improving the business image of the country.

## Conclusions

Three main approaches are distinguished in defining the concept of «diversification of international trade»: diversification as risk reduction, diversification as a marketing strategy and as a process of expanding the range of goods and services to optimize the industry structure.

Diversification may be accomplished at the corporate, national and interstate levels.

It provides for a gradual transition from raw material to high-tech exports, changes in the structure of imports reducing the share of household goods and increasing the share of high-tech equipment. Such diversification determines the direction of economic development towards increasing the efficiency of the economy.

Diversification of international trade is carried out through the diversification of exports and imports by commodity flows structure and geographical structure.

Vertical diversification shifts in the country's foreign trade are used to minimize the risks of significant price fluctuations in the world market of raw materials, as well as to form the preconditions and intensify economic development based on exports of high value-added products.

Horizontal diversification involves the production of new products that are not technologically related to existing ones and are intended for existing customers of the enterprise. All this is happening within one sector of the country's economy. Export expansion policy is used.

The state policy of diversification of the foreign economic sphere consists in creation and implementation of conditions for optimizing the sectoral and geographical structure of foreign trade flows, reducing dependence on world markets and ensuring effective trade in the system of foreign economic relations.

Purposeful policy of foreign trade diversification is a factor that significantly promotes economic development of a country, forms its international specialization in production and export of goods and services.

Diversification of the foreign economic sphere is especially important for countries with balance of payments deficits due to the need to import means of production, consumer goods, energy for their sustainable economic development.

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# INTERNATIONAL TRADE IN IRON ORE PRODUCTS: THE CONTEMPORARY TRENDS AND THE CHALLENGES FOR UKRAINIAN ENTERPRISES

**Venherska N.S., Lubenets I.O., Ryabchuk K.O.**
*Zaporizhzhia National University*
*Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 66*
nataljavengerskaja@ukr.net, lubenec@ukr.net, ryabchuk.kateryna@gmail.com
ORCID: 0000-0001-8171-8206, 0000-0002-4495-5947, 0000-0002-3845-0141

**Key words:**
international trade, export, import, iron ore products, trends, European Union

This article analyzes the characteristics of the international trade in iron ore products. The present issues in manufacturing the products were considered based on the example of PJSC "Zaporizhzhia Iron Ore Plant". The external and domestic factors, which influence the international trade between Ukraine and the European Union, have been outlined. The domestic ones have been outlined as follows: the collapse of the manufacturing capacities of the metallurgical and related industries due to the military campaigns in the East of Ukraine, a high level of uncertainty about the prospects of the heavy equipment industry, the devaluation of the national currency, the financial instability, the potential blockage of access to the ports of Mariupol and Berdyansk in the Azov Sea for the needs of the international trade, the mismatch between the legal acts of Ukraine and EU countries, a poor investment environment in the country, the social and economic instability. The external ones are the growing number of competitors (both within the national market and those based in other countries) and the protectionism in force within the EU market, the effects of Covid-19 on international trading trends. The outlook for trade in iron ore products between Ukraine and the EU has been analyzed. The trends in international trade in iron ore products, attributable to external and domestic factors, have been outlined. The import and export of Ukrainian products have been discussed. The actions aimed at the improvement of the cooperation between Ukraine and the EU in the international trade in iron ore products have been recommended. The driving forces affecting the increase in the exports of iron ore products have been established.

# МІЖНАРОДНА ТОРГІВЛЯ ЗАЛІЗОРУДНОЮ ПРОДУКЦІЄЮ: СУЧАСНІ ТРЕНДИ ТА ПРОБЛЕМИ УКРАЇНСЬКИХ ПІДПРИЄМСТВ

**Венгерська Н.С., Лубенець І.О., Рябчук К.О.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
міжнародна торгівля, експорт, імпорт, залізорудна продукція, тренди, Європейський Союз

У статті представлено аналіз особливостей міжнародної торгівлі залізорудною продукцією. Розглянуто сучасні проблеми у виробництві продукції на прикладі ПрАТ «Запорізького залізорудного комбінату». Виокремлено зовнішні та внутрішні фактори, що впливають на міжнародну торгівлю України з країнами Європейського Союзу. Визначено, що серед внутрішніх було виділено такі, як: знищення виробничої бази металургії та пов'язаних галузей, спричинених військовими діями на Сході України, високий рівень невизначеності щодо майбутнього важкої промисловості, знецінення національної валюти, фінансова нестабільність, загроза блокування доступу до портів Маріуполя та Бердянська в Азовському морі для потреб зовнішньої торгівлі, невідповідність нормативно-правових актів України з країнами ЄС, низький інвестиційний клімат в країні, соціально економічна нестабільність. Серед зовнішніх – зростаюча кількість конкурентів (як національних, так і з третіх країн) та протекціонізм, що діє на ринку ЄС, вплив Covid-19 на тенденції у міжнародній торгівлі. Проаналізовано перспективи торгівлі залізорудною продукцією між Україною та країнами ЄС. Виявлено тренди у торгівлі залізорудною продукцією на міжнародній арені, зумовлені зовнішніми та внутрішніми факторами. Розглянуто імпорт та експорт української продукції. Запропоновано заходи щодо покращення співпраці України та ЄС у міжнародній торгівлі залізорудною продукцією. Виокремлені рушії впливу на збільшення експорту залізорудної продукції.

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**Statement of the problem**

The mining industry in Ukraine is currently in a precarious condition. The worldwide financial and economic recession resulting from Covid-19 has affected both the national economy more broadly and its core industries, which include the mining sector. Among the most immediate problems is the downturn in production output, which has affected the financial status of PJSC «Zaporizhzhia Iron Ore Plant». A real threat to the industry's future growth remains the volatility of the prices on the market of iron ore raw materials, resulting from the unstable economic situation globally.

The topicality of the study arises from the argument that the mining industry is an inseparable and intrinsic part of the natural resources sector. The operation of the enterprises is a determinant for the condition of the core industries, in particular in the metallurgical, machine-building, construction, and agro-industrial sectors. The products of the mining industry have always been in high demand, so there is a strong potential for its further growth.

**The article sets out its goals** based on theoretical analysis to substantiate the current trends and the problems of international trade in iron ore products on the example of PJSC «Zaporizhzhia Iron Ore Plant».

**An analysis of the latest studies and publications**

The problem of the sale of iron ore products has been reported in academic papers by M. Kovalenko, T. Lyadenko, and other authors. The specific features of international trade have been discussed by: S. Ivanov, I. Rybak, and others.

**A summary of the core material of the study**

The international trade in products is an essential determinant that affects the level of global progress and the growth of the national economy. Each country implements its international trade policy when engaging in international trade relations, thus calling for consistency between the actions of a particular country and those of other countries through the regulation and management of international trade relations and the adaptation of national legislation to the international requirements.

After Ukraine and the European Union ratified an international agreement, the customs tariff was established to group the rates of the customs duties applied to the goods crossing the country's borders. The implementation of the customs and tariff instruments to regulate global trade ensures the predictability of export-import options for economic entities, their equal access to the global market, stimulates the growth of high-potential sectors of the economy, and supports an increase in the revenue side of the country's budget.

The government is supposed to facilitate the advancement of international trade relations, yet there are today many factors hindering the growth of international trade in iron ore products for our country, some of which include the following:

– the lack of an out-of-state distribution infrastructure;
– inefficient management of the enterprises;
– the underdevelopment of the basic principles of a market economy;
– the imperfect methods of state regulation of the economy generally and of activities in particular;
– a weak infrastructure for supporting export;
– the intensification of international economic competition;
– a weak infrastructure for foreign export support and protectionism [2, p. 170].

PJSC «Zaporizhzhia Iron Ore Plant» produces sintering and open-hearth ore. The total output is about 95% sinter ore, which contains 61% iron, while open-hearth ore contains 54–58% iron. The company produces a total of 4.5 million tonnes per year, with 21 km of tunneling per year. The company recorded 4,799 employees for 2020 [4].

The largest importers of iron ore products are the Czech Republic and Austria, while China has reduced its imports from Ukraine.

When analyzing exports of iron ore products at the beginning of 2021, it is noticeable that they have decreased by 3% compared to 2020. In contrast, the global economic environment resulted in a 2.1-fold increase in revenues reaching a total of 3.9 billion USD. Thus, at Qingdao CFR with 62% iron in China, for example, the first quarter of 2021 was an increase of 36% to 215 USD/tonne and in 2020 an increase of 74% with a value of 159 USD/tonne.

Thus, due to lower demand in China, the export of Ukrainian raw materials in the first quarter of 2021 reduced by 31% and amounted to 9.7 million tons, but the high prices have increased the revenue of Ukrainian exporters by 55%.

The drop in cargo traffic has led to a reduction of 16% to 13.3 million tonnes in the port of Pivdenny. It is noteworthy that this port accounts for more than 90% of Ukrainian iron ore exports.

Conversely, a recovery in demand for raw materials from European steel producers has helped the stabilization of iron ore shipments at the port of Izmail. The first half of the year resulted in a reduction of 1.6% to 1.2 million tonnes, compared to the previous year the shipment of iron ore exports from Izmail decreased by 27%. Izmail is the key point of shipment of iron ore products to the Austrian consumers, who increased imports of Ukrainian raw materials by 33% to 1.7m tonnes for the first half of the year.

Other European consumers prioritize the delivery of raw materials through railway transport. In particular, Ferrexpo increased its railway transportation of products to the European Union by 69.1% to 1.9 million tonnes between January and June of 2021. The largest European consumer of domestic iron ore products in the first half of the year has been the Czech Republic. It has increased the imports of ore from Ukraine by 36% to 2.6 million tonnes.

There are both domestic and foreign factors among the main problems affecting international trade in iron ore products of PJSC «Zaporizhzhia Iron Ore Plant». The factors that are external for the enterprise are those over which the enterprise has no influence or that influence may be insignificant. The external factors are subdivided into international, national, and market ones.

The domestic factors comprise as follows: the scale of the foreign economic activity – the number of

ISSN Print 2414-0287
ISSN Online 2707-8426

entities involved in international business; the costs involved in the production and sale of products abroad; the level of the technological difficulty of the products and their compliance with international standards – the more complex technology used, the more it is compliant with international standards, the more likely the products will be sold abroad; the expertise in foreign economic activity, i. e., the availibility of the industrial, managerial, organisational background for undertaking international business; the control over the adoption and the implementation of the decisions on the execution of the procedures in the field of foreign economic activity; the work of the customs service to improve the efficiency of the customs authorities and the level of optimisation of the products clearance procedures; the qualified management and staff membership, the share of the market, the innovation activities, the duration of the production cycle, the level of production spare parts, the composition of the balances, the paying capacity, the liquidity, the equity ratio, the cost of capital, the asset structure, the investment attractiveness, the income per share, the rate of profitability and the efficiency.

The external risks may comprise as follows: the economic freedom; the competition – as a result of its existence, the companies are forced to develop and to implement a strategy of the accelerated expansion of foreign operations, the improvement of the procedures to transact business with other enterprises; the availability in the state requires a review of the forms and methods of communication with the foreign partner if the company has a representation office in a particular country; the risks related to the prospects for political or economic changes that may reduce the protection level of the enterprise, as well as the opportunities for profit-taking.

We first examine the impact of the outdoor environment on PJSC «Zaporizhzhia Iron Ore Plant».

First, an important effect is produced by fluctuations in supply and demand for iron ore. Notably, the level of global prices is affected by the regulatory actions of national governments, as well as by increased railway tariffs for the export of iron ore.

According to I. Rybak [5, p. 13], the difference between the average domestic and export prices for commercial iron ore originating in Ukraine further indicates that mining and metallurgical companies within the same financial and industrial groups enter into agreements based on below-market prices.

The market for iron ore products is highly competitive. The demand in the market is determined by the availability of a large number of clients geographically located in a single area and a large number of suppliers whose products do not differ significantly in terms of their qualitative characteristics.

The key factors that directly or indirectly affect the competitiveness of mining enterprises within the iron ore market are as follows:

– a very intense competition on the iron ore market;

– a significant contribution of global trends in the global market of iron ore raw materials to the regional market;

– high quality of products;

– a market-oriented price and constant fulfillment of the contractual arrangements for the delivery of products; due to the surplus of supply over the demand for iron ore products [3, p. 112].

The regional iron ore market is significantly influenced by the trends observed in the global market. An enterprise is required to monitor the economic situation constantly to ensure a favorable operating environment and to assess changes in the situation from the perspective of the possible consequences for the enterprise. The mining industry is also heavily influenced by the situation in the national industrial market.

In the near term, several risks could have a significant impact on international trade with EU member states first and foremost:

– the financial deterioration of enterprises due to a gradual slowdown in the dynamics of economic activity;

– the reduced availability of credit to the real economy (high-interest rates and access conditions) due to the increasingly acute situation in the financial and banking sector of the state;

– the problem of unregulation of corporate governance issues, the failure to respect the rights of minority shareholders about participation in management and obtaining reliable information on the activities of joint-stock companies, the distribution of dividends based on the enterprises' performance, and the inability to verify the veracity of this information and, therefore, to influence the formation of the investment strategy of enterprises;

– the maintenance of the issue of an unfavorable investment climate as an integral characteristic, which covers an imperfect institutional and legal framework, an underdeveloped stock market, an unstable financial and credit system, and excessive tax pressure, inefficient use of depreciation amounts, inefficient regulatory activity, a low protection level of private investors' rights, high level of corruption in the area of investment activity [1, p. 46].

The main factors include a decrease in domestic consumption of iron ores and processed products due to the military conflict in Donbas and the economic crisis.

An important reason is also physically and functionally obsolete machinery. Indeed, unserviceable equipment, insufficient technological and resource flexibility, and low implementation of leading scientific and technological developments in the manufacturing process do not allow the enterprise to reach a manufacturing level that would allow it to compete with those from abroad.

A significant development in international trade in iron ore products is the introduction in the year 2019 of the EITI standard – the Extractive Industries Transparency Initiative in Ukraine [1]. The implementation of this standard has resulted in transparency and accountability of mining companies, public disclosure of mineral reserves, mining output, and taxes paid, as well as improvements in the legal and regulatory framework to create a favorable environment – both for mining enterprises and for the socio-economic development of iron ore mining regions.

To achieve efficiency of cooperation for Ukrainian enterprises with global corporations, it is necessary to

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develop a strategy for effective development of the foreign economic activity of an enterprise, and to form a system of its long-term goal, evaluating the potential capacity of entrepreneurship in a particular market. Only through a comprehensive study of world market conditions, an increase in the competitiveness of products, and the application of modern technologies it is possible to achieve an effect in foreign economic activity.

An effective way in which Ukrainian and EU enterprises can cooperate will be the facilitation of the conditions. A particular focus should be on overcoming bureaucracy and introducing a mechanism that will make it possible to resolve all disagreements with ministries distantly, i. e. electronically. It is also essential to improve and introduce a flexible tax, credit, and currency policy, which would stimulate the diversification of export-import transactions, as well as strengthen and ensure the convertibility of the national currency. The increase of the technological level, the implementation of energy- and resource-saving technologies, the increase in the level of mechanization and automation of production, the involvement of highly qualified specialists in the management of enterprises; scientific, technical, and technological renewal of production with ensuring its competitiveness through deep modernization; a reduction in resource intensity through the efficient use of own fuel and raw material resources. The use of the Ukrainian scientific potential and highly trained employees as a mechanism for enhancing the effectiveness of information and innovation policy. The research and development activities should be seen as the main way of overcoming the contradictions of socio-economic development, in particular the improvement of the living standards of the population.

Therefore, to improve the cooperation between Ukraine and the EU on international trade in iron ore products, it is necessary to set the right priorities and strategic goals at the national level. To change the situation, it is necessary to establish conditions for the effective use of scientific potential and to increase the role of the government in the implementation of an investment and innovation model for the industry's growth. The priorities of the restructuring have to be the reduction of energy intensity of production, the increase in demand for Ukrainian iron ore products in the domestic market, the support of full-cycle plants – beginning with the processing of raw materials and ending with the manufacture of high-tech products, the promotion of exports, making Ukrainian metal products competitive in the global market, and the attraction of investments.

## Conclusions

When analyzing the problems of international trade of PJSC «Zaporizhzhia Iron Ore Plant» with the countries of the European Union, consideration can be given to the fact that there is a problem of industry growth and reduction of production value through global competition, currency regulation, refund of value-added tax and, accordingly, lack of financing for export promotion. To increase capacity and compete with foreign enterprises, the iron ore industry requires massive investments. But international companies are reluctant to invest in Ukrainian companies due to flawed legislation, an unresolved tax system, and the lack of cooperation between the government and international corporations.

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# FINANCE AND MONEY TURNOVER

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## STRATEGY OF DEVELOPMENT OF THE FINANCIAL MARKET OF UKRAINE IN THE REALITIES OF TODAY

**Androsova O.F., Kairachka N.V.**
*Zaporizhzhya national university*
*Ukraine,69000, Zaporozhie, Zhukovsky str., 66*
androsovaef@gmail.com, 12456htd675koi78er110@gmail.com

**Key words:**
financial market, segment, currency market, credit market, capital market, strategic goals

With the development of the world economy, constant monitoring of the functional structure of the financial market becomes very important due to its significant impact on other sectors of the Ukrainian economy. The current state of the functional structure of the financial market is considered in the article, the strategic goals of further development of the constituent elements of the financial market are offered. The main significance of the existence of the financial market in the economic space of Ukraine is noted. The shortcomings of the financial market sectors that slow down their development are analyzed and clarified. Practical recommendations have been developed to improve the infrastructure of the financial market, which will lead to future growth of investment income in the economy and will be a prerequisite for further development of the infrastructure of the financial sectors of Ukraine.

## СТРАТЕГІЯ РОЗВИТКУ ФІНАНСОВОГО РИНКУ УКРАЇНИ В РЕАЛІЯХ СЬОГОДЕННЯ

**Андросова О.Ф., Кайрачка Н.В.**
*Запорізький національний університет*
*Україна, 69000, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
фінансовий ринок, сегмент, валютний ринок , кредитний ринок, ринок капіталів, стратегічні цілі

Із розвитком світової економіки дуже важливого значення набуває постійний моніторинг та функціональної структури фінансового ринку через його вагомий вплив на інші сектори економіки України. У статті розглянуто сучасний стан функціональної структури фінансового ринку, запропоновано стратегічні цілі подальшого розвитку складових елементів фінансового ринку. Відмічено головну значимість існування фінансового ринку в економічному просторі України. Проаналізовано та з'ясовано недоліки секторів фінансового ринку, які пригальмовують їх розвиток. Розроблено практичні рекомендації щодо удосконалення інфраструктури фінансового ринку, що зумовить у майбутньому зростання інвестиційних надходжень в економіку та стануть передумовою подальшого розвитку інфраструктури фінансових секторів України.

### Problem statement

The development of the financial market plays an important role in shaping the infrastructure of the financial sectors in the economy of Ukraine. It is an indicator of the presence of shortcomings in the economy, its level of development, the introduction of possible promising areas for its further functioning. The financial market is the main determining factor influencing the formation of features and characteristics of their own sectors. In addition, it combines existing sources of free financial resources and entities that need them or feel a significant lack of them.

### Analysis of recent research and publications

Problems of financial market infrastructure expansion and introduction of strategic goals of its development became the subject of research of such domestic scientists as: Shishpanova N.O., Ivanov A.O., Kovalchuk L.T., Mishchenko V., Bazylevych V., Vasilchenko Z., Savluk M., Gavrilyuk O., Galchynsky A., but this problem is very relevant and requires new research by the scientific community.

### Forming the goals of the article

The purpose of the article is to study the features of the functional structure of the financial market, identify the

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shortcomings of financial sectors that support the financial market of Ukraine, analyze the state of financial sectors, consider the strategic goals of the National Bank of Ukraine until 2025 and develop practical recommendations for financial market infrastructure. Due to the constant global economic development, the infrastructure of the financial market needs constant analysis and introduction of the latest technologies.

**Presentation of the main research material**

The most important component of Ukraine's financial system is the financial market. It plays an important role in ensuring the effective development of economic stability of the country, especially during the reign of the crown of viral infection in the world. This factor has suspended the development of Ukraine's financial infrastructure and exacerbated the problems associated with the functioning of financial markets.

The financial market is designed to constantly serve commodity markets and services markets, ensuring commodity-money relations in many aspects of their manifestation. [1, p. 8]. Therefore, the financial market is a sphere of specific economic relations, in the process of which the demand and supply for financial resources are formed and with the help of financial intermediaries their purchase – sale is carried out [2, p. 252–253].

The essence of the financial market was considered by a large number of foreign and domestic scientists from different points of view (Table 1).

Therefore, from the given options for defining the concept of «financial market», we can conclude that the financial infrastructure is a very important mechanism of the financial market, without which it is impossible to imagine its existence.

Scholars Borisova I.S. and Krasnikova O.M. interpret the concept of «financial system» as «a set of different types of funds of financial resources, concentrated at the disposal of the state, economic entities, individual financial institutions and the population to perform their functions, and also to meet economic and social needs» [7, p. 35]. The localization of migration and free capital transformation operations is the main indicator of determining the level of development of the financial system in countries with developed economies. Nevertheless, the availability of a developed institutional infrastructure is the key to successful implementation of the functional purpose of the financial system and financial market, because the system of financial intermediation, which is a subsystem of the financial market affects the transformation of savings into investment and participates in the organization of capital accumulation.

All components of the financial market are closely interconnected. The financial market achieves the greatest efficiency if all its components are involved: the money market and the foreign exchange market, the credit market, the securities market and the financial services market [2, pp. 252–253].

According to A.I Shchetinin, the money market is the part of the financial market where short-term credit operations are carried out. Almost all financial market instruments are presented here, but mostly it is money (cash, non-cash, foreign currency) [8].

Table 1 – The essence of the concept of "financial market"

| Scientist | The essence of the concept |
|---|---|
| Komarinsky J., Yaremchyk I. [3, p. 19] | The financial market is a market of loan capital, or a system of economic relations that ensures the accumulation of free money, their transformation into loan capital and its redistribution among the participants in the process of reproduction. |
| Blank I.O. [3, p. 19] | The financial market is a market in which the object of purchase and sale are various financial instruments and services. |
| Borisova I.S., Krasnikova O.M. [2, p. 198] | The financial market is a mechanism for the redistribution of capital between creditors and borrowers through intermediaries based on supply and demand. |
| Khodakivska P. and Belyaev V.V. [3, p. 19] | The financial market is a self-regulating system of markets where the supply and demand of various financial assets and services related to the acquisition of assets is concentrated; it is a sphere of economic relations between market participants in the process of formation and realization of demand and supply of financial assets. |
| Smolyanska O.Y. [3, p. 19] | Financial market – a mechanism for accumulation and redistribution of financial resources of the country; organized or informal system of trading in financial instruments, the main role in which is played by financial institutions that direct cash flows from owners to borrowers. |
| Tatarin N.B., Chop T.I. [4] | The financial market is a mechanism of redistribution of financial resources between business entities, the state and the population, between participants in the budget process, some international financial institutions. |
| Mikhalchynets G.T. [5, p. 28–34] | The financial market is a set of coordinated, complementary and regulated processes and mechanisms of creation, accumulation, transformation and movement of cash flows between all actors of the world economic space, as well as determines their properties for the transformation of economic processes in globalization. |
| Androsova O.F. | The financial market is a powerful segment of the financial infrastructure that concentrates financial resources and buys and sells them, relying on credit and financial institutions, taking into account the demand for supply. |
| Mnyuchin S.T., Phillips K.S. [6, p. 220] | The financial market is a financial system covering a wide variety of institutions and services (depository system covering banks, credit unions, savings associations; capital market; non-bank financial institutions, financial technologies and financial innovations). |

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In the money market is the formation of the price of short-term financial resources. In this market there are operations due to which the National Bank has an influence on the cost of such resources. This is important to ensure the effective functioning of the monetary transmission mechanism.

The influence of the NBU plays an important role in regulating the functional state of the money market. To do this, he pursues a monetary policy. Its instruments are required reserves, repo transactions, purchase and sale of government securities, swap transactions. The discount rate acts as the main key instrument of monetary policy. The NBU constantly carries out operations at the discount rate. In turn, they have a significant impact on the formation of the value of funds in the interbank market. This makes it possible to keep market rates close to the discount rate, thus fulfilling the operational goal of the National Bank of Ukraine. Figure 1 shows the monetary operations of the NBU with banks.

In November and December 2020, the discount rate was 5.0%, credit overnight – 6.0%, DS overnight – 7.0%. In early 2021, the figures did not change, but in early March there was an increase in annual interest rates by 0 5 units, so as of March-April the discount rate was 5.5%, credit overnight – 6.5%, DS overnight – 7.5%. And already on April 17 the interest rate increased by 1.0%. So, from the middle of April the discount rate was 6.5%, credit overnight – 7.5%, DS overnight – 8.5%. This level of interest rates lasted until the end of July. And as of July 23, the indicators increased by 0.5%: the discount rate was 7.0%, credit overnight – 8.0%, DS overnight – 9.0%. In September-October, there was an increase again and the discount rate was 7.5%, credit overnight – 8.5%, DS overnight – 9.5%. Therefore, analyzing the chart, we can conclude that for the period from 2020 to early 2021, the level of interest rates remained unchanged, and at the beginning of March 2021 there was a steady increase. As a result, in the autumn of 2021, interest rates increased by 2.5% compared to 2020.

The cost of loans provided by the NBU to commercial banks depends on the level of the discount rate. It determines the interest rate at which commercial banks receive money from the central bank. And this, of course, affects the interest rate at which commercial banks provide loans to citizens and businesses. The lower it is, the cheaper refinancing loans and bank loans for borrowers are for banks [9] In our case, the NBU increased the discount rate by 2.5%, which means an increase in interest rates on deposits and loans. And the availability of loans for citizens and businesses depends on the cost of loans.

Currently in the corporate sector, the recipients of new bank loans are solvent companies. Hryvnia loans are issued to companies that have not had solvency problems since the beginning of the crisis and their profits are growing by more than 25% year on year. There is also an increase in the level of consumer lending. Due to the decrease in the number of supervised entities in the non-banking financial services markets and the improvement of the Natskomfinposlug regulatory environment over the past two years, the following key development indicators have been growing: [10]

1) factoring (+ 184.8%);
2) loans (+ 88.6%);
3) assets (+ 22.7%);
4) the cost of leasing agreements (+ 126%);
5) insurance payments (+ 40.4%).

However, the role of lending in supporting economic growth is insignificant. An important prerequisite for accelerating Ukraine's economic growth is the revitalization of credit financial institutions.

In recent years, there has been an active use of measures to strengthen the protection of creditors' rights, namely:

1. Strengthening the protection of creditors' rights in civil relations.

2. Amendments to the tax legislation regarding the exemption from taxation of banks and individuals-borrowers for restructuring operations and forgiveness of foreign currency loans.

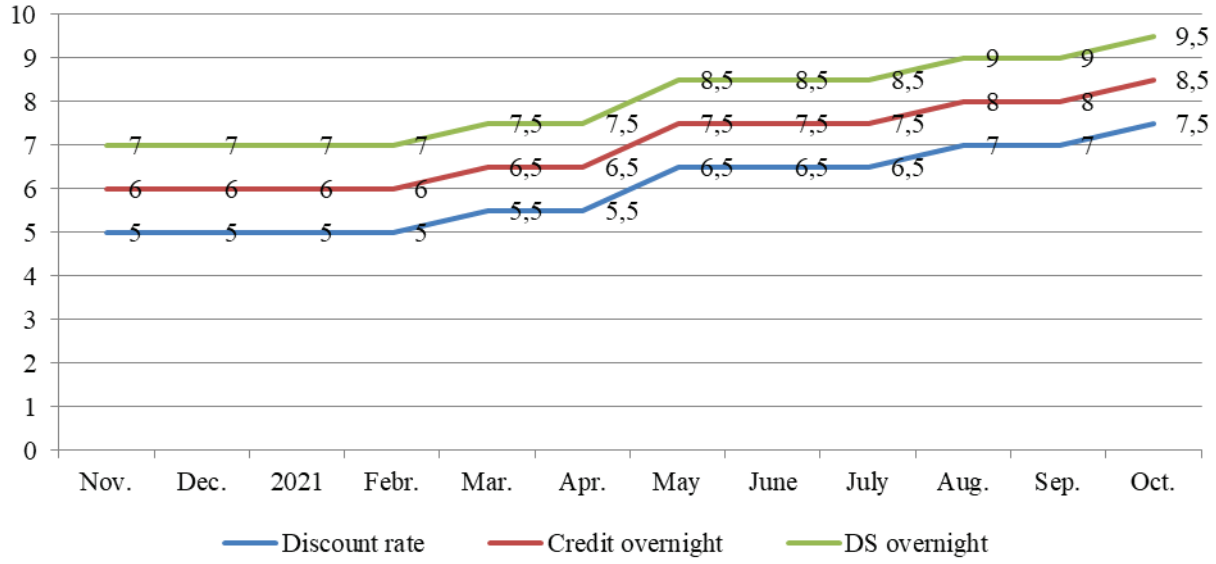


Fig. 1 – NBU monetary transactions with banks: interest rates as of 2020–2021

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3. Creating a mechanism for voluntary financial restructuring of corporate debt at the legislative level.

4. Introduction of the institution of bankruptcy of individuals, establishment of the mechanism and conditions of restructuring of debts of individuals on loans in foreign currency.

But first and foremost, we believe that the institution of enforcement needs to be further strengthened. In addition, at the legislative and institutional levels, the creditor's protection in relations with debtors is not fully ensured, and the complication of the recovery process is influenced by such factors as: ambiguity and inefficiency of law enforcement. about half of the total is occupied by the share of NPL in the banking system of Ukraine.

Therefore, the credit market has certain disadvantages such as: rising interest rates on loans and deposits for individuals and small and medium-sized businesses, which makes them less accessible to the public. To overcome the shortcomings that slow down the development of the money market and contribute to its development in the future, the NBU has set strategic goals to be achieved by 2025, to improve the credit market can be called the following goals.

5. Reduce the amount of non-performing loans in the banking system. Today, as a percentage of total credit, they are 52.9%. By 2025, it is planned to reduce them to 10% of total loans.

6. Currently, the volume of net bank loans to GDP (businesses and individuals) is 16.5%, in 2025 it is planned to increase their volume to 22%.

7. As of 2021, the penetration of SME lending is 1.4% of GDP, in 2025 it is planned to increase to 3% of GDP.

8. Currently, the penetration rate of non-bank lending is less than 1.9% of GDP, and in 2025 it is planned to increase them by 3% of GDP.

9. Currently, the level of effective lending using instruments of trade and structural financing is less than 3% of the assets of the banking system, and in 2025 it is planned to increase their share by at least 10% of the assets of the banking system.

10. At present, the ratio of cash (M0) to GDP is 12.01%. In 2025, the goal is to reduce the ratio of cash (M0) to GDP and not more than 7.5%.

The next segment of the financial market – the capital market – attracts a lot of attention.

According to the Financial and Economic Dictionary, the capital market is the part of the financial market where demand and supply for medium-term and long-term borrowed capital are formed [11].

According to Article 4 of the Law of Ukraine «On Capital Markets and Organized Commodity Markets», the money market is a set of money market participants and legal relations between them that arise during transactions on money market instruments and currency values [12].

A significant share of the capital market in Ukraine remains underdeveloped. Therefore, to improve the situation on the capital market, the NBU plans to launch the institution of a nominal holder. However, to ensure the further economic development of the country, it is necessary to consolidate, modernize and expand the capabilities of clearing, exchange and settlement infrastructure of capital markets in accordance with the requirements of European acts and international standards. In order to ensure the improvement of capital market infrastructure, the Concept of Capital Market Infrastructure Reform in Ukraine was formed and approved in Ukraine in accordance with international standards with the support of the EBRD. As part of the implementation of the concept, work began on the development of a target model for reforming the settlement, depository and clearing infrastructure of capital markets [10].

According to the «Financial and Economic Dictionary», the foreign exchange market is a market that serves domestic and international payment turnover by exchanging one currency for another in the form of purchase and sale [11]. The foreign exchange market of Ukraine carries out transactions for the purchase and sale of non-cash and cash foreign currency, as well as bank metals. Participants in the foreign exchange market of Ukraine are banks and non-banking institutions, bank customers, as well as the National Bank. The regulator conducts operations in the foreign exchange market in order to smooth out excessive fluctuations and the accumulation of international reserves. The National Bank calculates the official exchange rate of hryvnia to foreign currencies and the exchange rate of bank metals [13].

Characteristic of the modern foreign exchange market is the presence of a wide range of regulatory institutions, which include: relevant government agencies; system of international financial organizations, groups and agreements operating on an interstate basis, as well as the system of currency risk insurance. However, in modern conditions, the role of the state in currency regulation is growing, but government regulation should not mimic market self-regulators. It only needs to be adjusted and supplemented accordingly [14].

In figure 2 analyzes the level of purchasing power of the national currency of Ukraine in comparison with the US dollar and the euro.

So, you can see that at the end of 2020 the US dollar was at UAH 33. for $1. At the beginning of 2021, the dollar rose, its value reached 34 hryvnias. per unit. However, after the jump there was a decrease at the level of 32–33 UAH. per dollar during the period from February to July. In the autumn of September-October, the dollar fell sharply. As of October 25, the dollar exchange rate remains at UAH 30. for a dollar. From the end of 2020 to May 2021, there are fluctuations in the euro at the level of 28 and 27 UAH. per unit. And since June, the euro exchange rate has fallen slightly and fluctuates between 27 and 26 hryvnias. per unit. In autumn, the euro exchange rate finally settled at UAH 26. Therefore, analyzing the level of the euro and the US dollar, we can conclude that from the period to 2020–2021 there was a decline in foreign currency and the strengthening of the national currency of Ukraine.

To resolve the situation in the foreign exchange market, the NBU intends to introduce a new system of currency regulation by 2025. It aims to simplify cross-border transactions with currency values and expand the list of available currency transactions. The ultimate goal of this

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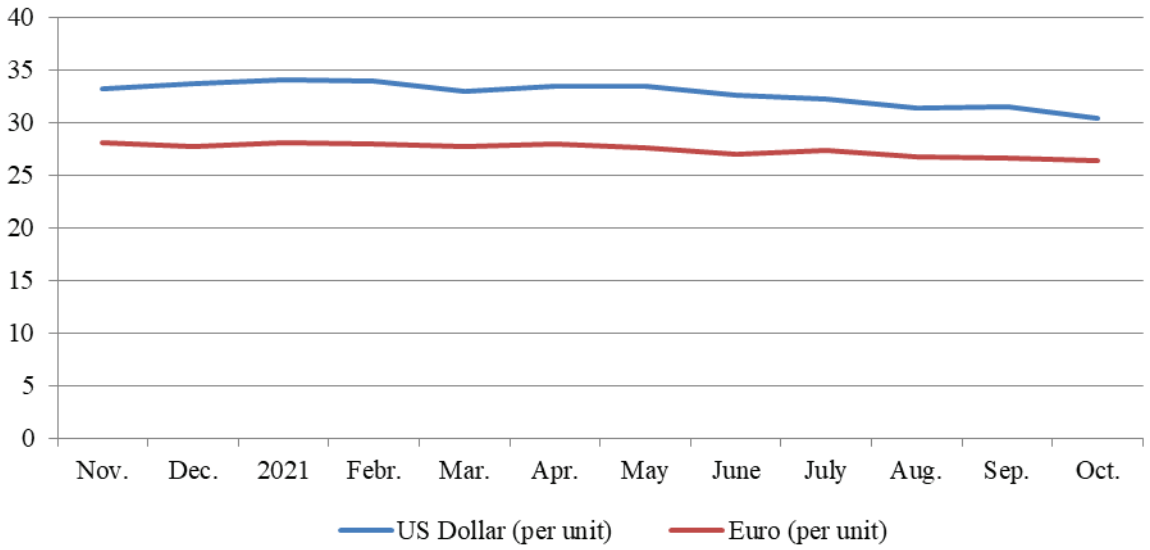


Fig. 2 – Official exchange rate of hryvnia against foreign currencies 2020–2021

innovation will be to remove all existing restrictions and make the transition to a regime of free movement of capital. The result is a decrease in the share of dollarization of loans and deposits of the banking system and borrowings in foreign currency [10].

In general, the strategic goals for overcoming the shortcomings and improving the functioning of the foreign exchange market are as follows. Firstly, the reduction of the percentage of net loans from the total volume of loans on a net basis, today their share – 41.4%, in 2025 it is planned – no more than 30%. Secondly, a decrease in the share of foreign currency deposits in total deposits. Currently, they account for 41.7% of total deposits, planned in 2025 – no more than 30%. Thirdly, to establish the level of the share of public debt in the national currency not less than 50%, as of today its share – 36.64%. Fourth, the NBU plans to fully implement the points of the roadmap related to currency liberalization. To date, only the roadmap for the liberalization of currency regulation has been approved.

**Conclusion**

Therefore, from the above material, it can be noted that the constant stimulation of the development of the structure of the financial market is an important factor for further expansion of the infrastructure of the Ukrainian market. In turn, each of its sectors (credit market, foreign exchange market, securities market and financial services market) is able to attract financial resources, various methodological and organizational principles of operation in the implementation of modernization and regulation of their activities. Strategic goals are indicators of the development of the country's economic system.

Therefore, the «Strategy for the Development of Ukraine until 2025» should focus on the development of the financial market in general and its sectors (credit market, foreign exchange market, securities market and financial services market) for economic growth of Ukraine's economy in the future.

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# THE ROLE AND IMPORTANCE OF BANKING SUPERVISION FOR THE DEVELOPMENT OF THE BANKING SYSTEM OF UKRAINE

**Bilous A.V., Kushnir S.O.**
*Zaporizhzhia National University*
*Ukraine, 69000, Zaporizhzhia, Zhukovsky str., 66*
anytabelous8@gmail.com, SvetlanaAK@ukr.net

**Key words:**
banking supervision, NBU, economic standards, analysis, law, regulation, improvement, financial institution

The Article reviews the essence of banking supervision. The definition of this concept is provided by various scholars. Based on the materials analyzed, the own definition of banking supervision was formulated. In banking, all financial institutions must adhere to banking supervision, as the outcome of banking activity depends on the quality of the bank itself, the correct task and the achievement of certain goals. Protecting the interests of depositors, creditors, preventing bankruptcy and financial difficulties, forced the NBU to introduce a number of certain economic standards in the activities of banks, which are a means of monitoring the financial condition of the banking institution and are mandatory. Data on the implementation of NBU economic standards in accordance with the Law of Ukraine "On Banks and Banking" are provided. The analysis of economic standards fulfillment by the main commercial and state banks of Ukraine for 2018–2020 is carried out. The total amount of regulatory capital of banks for 2019–2021 is analyzed. In the banking activity of Ukraine there is a need to develop measures and instruments for banking supervision in order to improve and enhance it. In order to strengthen the role and importance of banking supervision, reduce the likelihood of banks liquidation in Ukraine, it is recommended to separate the banking supervision authority from the NBU and create a State Banking Supervision Service accordingly, which should independently regulate the activities of state banks and commercial banks. The organizational structure of the State Banking Supervision Service has been developed. It is recommended to add to annual reporting a list of indicators that would provide possibilities of additional control to the NBU banking supervision and eliminate the submission of incorrect data by banks on their activities.

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# РОЛЬ ТА ЗНАЧЕННЯ БАНКІВСЬКОГО НАГЛЯДУ ДЛЯ РОЗВИТКУ БАНКІВСЬКОЇ СИСТЕМИ УКРАЇНИ

**Білоус А.В., Кушнір С.О.**
*Запорізький національний університет*
*Україна, 69000, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
банківський нагляд, НБУ, економічні нормативи, аналіз, закон, регулювання, вдосконалення, фінансова установа

В статті розглянуто сутність банківського нагляду, наведено визначення зазначеного поняття різними науковцями. Відповідно до проаналізованого сформульовано власне визначення банківського нагляду. У банківській діяльності всі фінансові установи повинні дотримуватися банківського нагляду, оскільки результат роботи банків залежить від якості роботи самого банку, коректної поставленої задачі та досягнення певних цілей. Захист інтересів вкладників, кредиторів, попередження банкрутства та скрутного фінансового становища, змусили НБУ впровадити в діяльність банків ряд певних економічних нормативів, які є засобом моніторингу фінансового становища банківської установи та є обов'язковими до виконання. Наведені дані щодо виконання економічних нормативів НБУ відповідно до Закону України «Про банки та банківську діяльність». Проведено аналіз виконання економічних нормативів основними комерційними та державними банками України за 2018–2020 роки. Проаналізовано загальна сума регулятивного капіталу банків за 2019–2021 роки. У банківській діяльності України є необхідність розробки заходів та інструментів банківського нагляду з метою його вдосконалення та підвищення. Для посилення ролі і значення

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банківського нагляду, зниження вірогідності ліквідації банків в Україні, рекомендовано здійснити відокремлення органу банківського нагляду від НБУ та відповідно створити Державну службу нагляду банківської діяльності, яка повинна самостійно регулювати діяльність державних банків та комерційних банків. Розроблено організаційну структуру Державної служби нагляду банківської діяльності. Рекомендовано додати до річної звітності перелік показників, які надавали б можливості додаткового контролю банківському нагляду НБУ та усували представлення банками некоректних даних про свою діяльність.

**Formulation of the problem**

Modern conditions of banking institutions' operation require them to make great efforts to ensure the overall stability and stability of their financial condition. However, the recent global financial crises show that the domestic banking supervision system needs to be improved and its role strengthened, as the NBU's policy of achieving and maintaining price and financial stability in the country has been demonstrated to be inefficient.

**Analysis of recent research and publications**

The role and importance of banking supervision for the development of Ukraine's banking system has always aroused the interest of both domestic and foreign scholars, as effective banking supervision is one of the most important tasks of any country's central bank. The following scholars should be distinguished among those who considered the role and importance of banking supervision in view of banking system development: N. Yu. Hladynets, M.M. Hustei, T.P. Hudz, M.M. Kovalenko, T.A. Latkovska, S.H. Mamedov, A.V. Nikitin, I.B. Okhrymenko, L.O. Prymostka, O.M. Rats, O.B. Bus, H.P. Tabachuk, Yu.M. Umantsiv.

**Highlighting previously unresolved parts of the overall problem**

In recent years, a big part of banks in Ukraine has been liquidated, in other words, the instruments of banking supervision used have been ineffective and inefficient, or used untimely or incorrectly. At present, there is a need to develop measures and instruments for banking supervision in order to improve it and increase the role of banking supervision for banking system development in Ukraine. This will enhance its influence on the banking sector, ensure dynamic, sustainable development of the banking sector, as well as increase its competitiveness in the international market.

**Purpose of the Article**

Consider theoretical and practical aspects of banking supervision in Ukraine and to develop ways to improve it.

**Presentation of major research material**

Banking supervision is an integral part of the country's banking activities and an important component of ensuring the stable functioning of its economy.

Bodies of banking supervision in Ukraine provide proper and reliable supervision over the activities of banking institutions, check their compliance with regulatory legal acts governing banks, the legality of their operations, and compliance with regulations.

V.V. Kostenko views banking supervision as a set of procedures for constant monitoring by special state bodies or other bodies of activities carried out by legal entities (banks) not subordinated to it in order to identify violations in banking legislation [1, p. 705].

I.M. Panaseiko and M.O. Huba sees banking supervision as an important component that should support stable functioning of the banking system and market relations of the state [2, p. 518].

The Law of Ukraine «On the National Bank of Ukraine» defines banking supervision as a certain system of control and active orderly actions taken by the National Bank of Ukraine and aimed at ensuring compliance by banks and other persons with Ukrainian legislation and established standards in order to ensure stability of the banking system, as well as protect the interests of depositors and creditors of the bank [4].

Protecting the interests of depositors, creditors, preventing bankruptcy and financial difficulties, forced the NBU to implement into banking activity compliance with certain economic standards, which are the means of monitoring the banking institution's financial condition and are mandatory. We will illustrate the data on economic standards in general in the banking system of Ukraine for 2018–2020 in Fig. 1.

The statutory ratio of capital adequacy (H3) should be at least 7%, on 01.01.2020 it was 13.5%, and on 01.01.2021 it was 15.67%, i. e. there was an increase, which indicates a positive activity of the bank, because it indicates an increase in financial stability.

In addition, an increase in the statutory ratio of capital adequacy allows banking institutions to offset the negative financial consequences of their own funds.

The short-term liquidity ratio should be at least 60%. Based on the presented data we can see that in the banking system of Ukraine the ratio reached a high value during 2018–2020, exceeded the statutory one, namely 93.52% on 01.01.2019, 94.35% on 01.01.2020, i. e. it increased by 0.8%. But on 01.01.2021 it decreased by 7.5% and amounted to 86.82%.

The short-term liquidity ratio for the period 01.01.2019–01.01.2021 did not fall below 86% and corresponded to the regulatory value. The ratio is set to control the bank's ability in terms of its ability to fulfill the short-term liabilities at the expense of liquid assets. We also observe the implementation of the statutory ratio H7 for the period 01.01.2019–01.01.2021 in the range of 17.61–19.83%, which does not exceed the statutory ratio of 25%.

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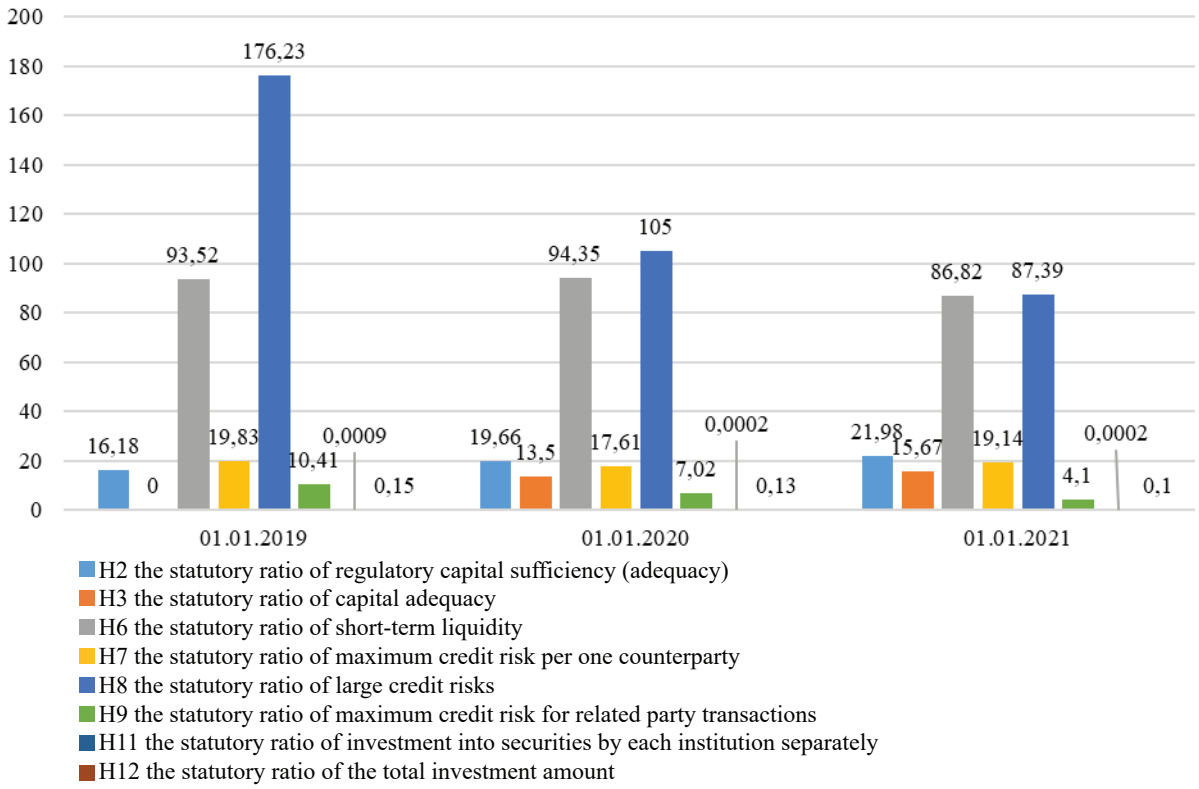


Fig. 1 – Economic Standards in General in the Banking System of Ukraine for 2018–2020 [3]

The statutory ratio of the maximum amount of credit risk per one counterparty in the banking system of Ukraine fluctuated, so on 01.01.2020 it fell by 2.2%, and on 01.01.2021 on the contrary increased by 1.5%.

The economic statutory ratio H8 for the analyzed period tends to decrease by 71.2% from 176.23% to 105% on 01.01.2020. The statutory value of this indicator should not exceed 8 times the size of regulatory capital. During the analyzed period, this statutory ratio does not exceed 8 times the size of regulatory capital. We should also note the decrease in the statutory ratio of large credit risks by 17.6% on 01.01.2021 to 87.39%.

The credit risk ratio as an element of bank economic standards aims to prevent excessive concentration of credit risk in the bank, as the insolvency of one or more counterparties can significantly destabilize the bank and even lead to its bankruptcy. With the optimal H9 value of 25% at most, the statutory ratio of the maximum amount of credit risk for transactions with related parties in 2018 was 10.41%, in 2019–7.02%, and in 2020–4.1%. The decrease in this indicator by 3.4% in 2019 and by 2.9% in 2020 indicates a decline in credit risk in the banking system of Ukraine. The level of credit risk of the banking system is optimal and does not have a negative impact on the stability of the entire banking system.

The statutory ratio H11 is also met, however it has almost zero value during the analyzed period at a threshold level of 15%. Commercial banks adhere to the value of the H12 statutory ratio of 60%, but during the analyzed period the indicator is low, and there is a tendency of its reduction by 0.02% from 0.13% to 0.15% in 2019 and by 0.03% from 0.13% to 0.1%. This was influenced by the instability of Ukraine's financial system, which discourages commercial banks from pursuing investment policies. Comparing the actual investment standards with the marginal ones allows us to make a conclusion about the low investment activity of the banking system of Ukraine. Banks are not interested in making direct investments in Ukrainian companies.

Let's present data on the regulatory capital of the most well-known commercial and state banks of Ukraine for 2018–2020 in the analytical Table 1, taking into account the reduction of their regulatory capital according to data on 01.01.2021.

The presented data show changes in the regulatory capital of the main banks of Ukraine in recent years. Thus, JSC CB «PrivatBank» had the highest level of regulatory capital, namely UAH 19,555,682 THS on 01.01.2019. On 01.01.2021 there was a positive trend, because it has almost doubled. JSC «Ukreximbank» also had one of the largest levels of regulatory capital of UAH 11,147,236.6 THS on 01.01.2019, which grew annually and amounted to UAH 15,049,595.4 THS01.01.2021

Thus, such positive changes in regulatory capital in most commercial banks of Ukraine during 2018–2020, led to the fact that the regulatory capital adequacy ratio was higher than the statutory value by 10% throughout the study period. On 01.01.2019 it was 16.18%, on 01.01.2020 it increased to 19.66%, i. e. by 3.5%. As of 01.01.2021, it was 21.98%, which also indicates a positive upward trend in this indicator.

We will illustrate the data on the statutory capital adequacy ratio (H3) for certain banking institutions in Ukraine for the period 01.01.2019–01.01.2021 in Fig. 2.

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Table 1 – The total amount of regulatory capital of the main commercial and state banks of Ukraine, UAH THS [3]

| Bank Name | 01.01.2019 | 01.01.2020 | ± | 01.01.2021 | ± |
|---|---|---|---|---|---|
| JSC CB "PrivatBank" | 19,555,682.7 | 19,223,588.3 | -332,094.4 | 35,256,911 | 16,033,322.7 |
| JSC "Oschadbank" | 13,200,548 | 12,355,512 | -845,035.9 | 18,132,364 | 5,776,852 |
| JSC "Ukreximbank" | 11,147,236.6 | 13,691,472.8 | 2,544,236.3 | 15,049,595.4 | 1,358,122.6 |
| JSC "Raiffeisen Bank Aval" | 10,480,006 | 10,674,030.4 | 194,024.4 | 10,474,032.6 | -199,997.8 |
| JSC "PUMB" | 5,282,255.4 | 7,914,882.2 | 2,632,626.9 | 8,589,500.3 | 674,618 |
| JSC "CREDIT AGRICOLE BANK" | 4,746,765.3 | 5,245,262.1 | 498,496.8 | 6,220,308.1 | 975,046 |

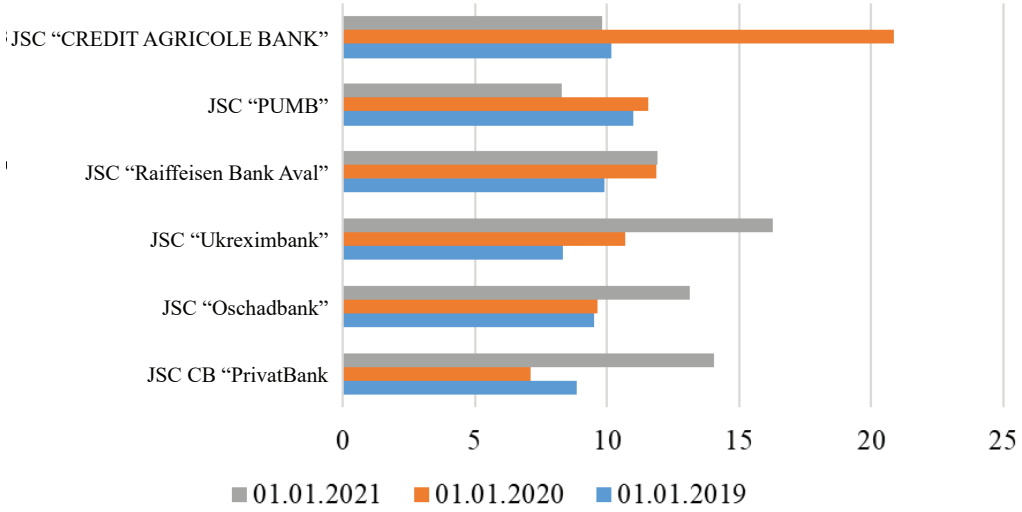


Fig. 2 – The statutory capital adequacy ratio (H3) for certain banking institutions in Ukraine for the period 01.01.2019–01.01.2021 [3]

The presented data show that all banks reached the statutory value of capital adequacy ratio (H3) for the period 01.01.2019–01.01.2021. In addition, there was a positive trend towards the growth of this indicator.

Let's analyze the implementation of economic standards by the main commercial and state banks of Ukraine in Table 2.

The short-term liquidity ratio should be at least 60%. Based on the presented data we can see that all banking institutions under analysis complied with this standard, in fact it was higher on 01.01.2021.

The ratio of the maximum amount of credit risk per counterparty should not exceed 25%, i. e. all banking institutions have complied with the NBU requirements on the maximum amount of credit risk per counterparty.

The statutory ratio H11 is also met, but has almost zero value during the analyzed period at a limit of 15%. Banking institutions also complied with the statutory ratio on the total amount of investment, but it should be noted that as of 01.01.2021 this figure was very low.

Daily and rapid changes are forcing any evolutionary system to constantly improve, to change, including banking supervision in Ukraine. This becomes especially important because the banking system is one of the central in the country.

The National Bank of Ukraine should create a regulatory framework for effective banking activities of all financial institutions and issue regulations governing the establishment and operation of banks, the relationship of the banking institution with depositors, investors, creditors, and borrowers.

In order to strengthen the role and importance of banking supervision in Ukraine, we recommend to separate the banking supervision authority from the NBU and establish the State Banking Supervision Service.

We consider it necessary to distinguish two main components in the structure of the State Banking Supervision Service:

– supervision of commercial banks;
– supervision of state-owned banks.

Table 2 – Analysis of meeting economic standards by the main commercial and state banks of Ukraine, UAH THS [3]

| Bank Name | H2 | H6 | H7 | H8 | H9 | H11 | H12 | Ліквідність-1 | Ліквідність-2 | LCRвв | LCRів |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JSC CB "PrivatBank" | 28,09 | 92,92 | 9,62 | 0,00 | 0,16 | 0,06 | 0,07 | 92,69 | 0,7120 | 278,23 | 218,18 |
| JSC "Oschadbank" | 19,00 | 64,84 | 20,35 | 156,57 | 0,40 | 0,05 | 0,14 | 119,93 | 0,0265 | 360,03 | 232,97 |
| JSC "Ukreximbank" | 23,27 | 84,32 | 19,97 | 153,85 | 0,33 | 0,02 | 0,19 | 2,55 | 0,0600 | 342,83 | 370,85 |
| JSC "Raiffeisen Bank Aval" | 18,04 | 88,40 | 15,12 | 64,82 | 7,20 | 0,80 | 0,84 | 3,29 | 0,0014 | 286,15 | 467,56 |
| JSC "PUMB" | 18,39 | 98,28 | 9,86 | 0,00 | 6,06 | 0,12 | 0,15 | 2,0 | 0,0035 | 182,36 | 261,03 |
| JSC "CREDIT AGRICOLE BANK" | 17,80 | 94,28 | 19,79 | 60,76 | 0,35 | 0,07 | 0,07 | 1,12 | 0,0000 | 218,31 | 206,01 |

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In addition, given the crisis operating conditions of state banking institutions, a large proportion of troubled banks and credit and financial institutions, we consider it appropriate to introduce a certain organizational department that would constantly monitor and pay special attention to troubled banks, looking for measures to improve the situation, strengthen such a banking institution, increase its profitability, profitability of assets and capital of the bank.

The developed organizational structure of the State Banking Supervision Service is presented in Figure 3.

Implementation of the developed organizational structure of the State Banking Supervision Service will allow for banking supervision in various areas, which in turn will allow faster tracking of problematic, illegal, shadow transactions that negatively affect the activities of banking institutions and the banking sector in general.

It should be noted that at present, Ukrainian banks are also required to publish their financial statements, which include certain types of reporting, but in our opinion, the set of reports is insufficient. After all, the financial statements may be slightly distorted. For example, banks may incur large expenditures in the fourth quarter, which will negatively affect the annual financial result, while the financial result for the first three quarters will be higher. Therefore, we recommend supplementing the reporting with a list of indicators of banking institutions' business activity, which must be published on the bank's website and be of informative nature (Table 3).

Analysis of the developed indicators of the bank's business activity for different periods will allow the bank to monitor the outflow of customers, growth or decrease of the deposit base, current accounts. It will also allow to perform

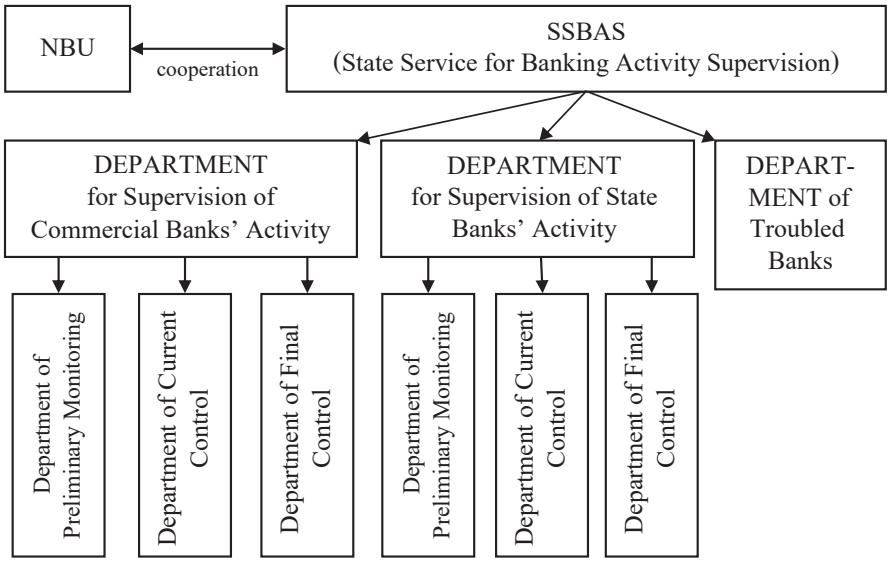


Fig. 3 – The developed organizational structure of the State Banking Supervision Service

Table 3 – Recommended Indicators of Profitability and Efficiency of the Banking Institution

| No. | Indicator | Calculation Formula | Description |
|---|---|---|---|
| 1 | Return on Assets | $ROA = \frac{ЧП}{A} \times 100,$ where *ЧП* – net income; *A* – bank assets | The ratio of the bank's net income after taxes to the bank's assets is defined as the ratio of the amount of income to the amount of borrowed assets. The statutory ratio is between 1% and 12% |
| 2 | Return on Equity | $ROE1 = \frac{ЧП}{Ka} \times 100,$ $ROE2 = \frac{П}{Ск} \times 100,$ where *ЧП* – the bank's net income, *Ka* – average share capital of the bank, *П* – income, *Ск* – authorized capital | The ratio of the bank's net income after taxes to share capital, which characterizes the efficiency of equity use. The statutory ratio constitutes at least 15% |
| 3 | EPS | $ЧПа = \frac{ЧП}{Na},$ where *ЧП* – net income after taxes; *Na* – number of outstanding shares | Net earnings per share or indicator of the level of return on share capital Allows you to estimate payments in favor of the main owners |
| 4 | Profitability | $RB = \frac{П}{B},$ where *П* –income; *B* – the bank's expenditures | An indicator of the banks' profitability level the bank's efficiency. Used to assess the effectiveness of expenditures |

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a detailed analysis of the bank's deposit and credit products, look for ways to improve them, and to increase profitability.

**Conclusions of prospects of research**

In such a way, the introduction of a developed organizational structure of banking supervision, and the introduction of business activity indicators in the financial statements for public disclosure would allow for improvement of the banking supervision system in Ukraine and significantly increase its importance and efficiency. The topic of further research should be the introduction of new types of banking supervision.

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# FORMATION OF FINANCIAL DEVELOPMENT STRATEGY

**Kushchik A.P., Kryvosheenko S.V.**
*Zaporizhzhia National University*
*Ukraine, 69600, Zaporizhzhia, str. Zhukovsky, 66*
20favorit10@i.ua

**Key words:**
corporate strategy, financial strategy, financial development, evaluation criterion, strategy components

The article considers topical issues of corporate financial strategy development. It is noted that in the system of corporate management, the strategy of financial development is in the central place, as its implementation is associated with long-term financial and economic policy of the enterprise. In practice, corporate financial strategy is a key bearer of information about the future development of the enterprise, on the basis of which its image is formed, investors are attracted, creditors' confidence increases. New economic relations, which are created on the basis of the information economy, stipulate progressive ways and methods of enterprise management. The formation of corporate financial development strategy should be carried out taking into account: the influence of external and internal factors on the activities of the enterprise; availability of production, financial, marketing and human resources. Depending on this, companies can form such financial strategies that will achieve a positive result, in particular, to stabilize their financial stability, profitability, competitiveness, to maintain certain market positions. After all, the correct choice of financial strategy is a necessary condition for improving the management of enterprises and increasing the efficiency of their activities.

# ФОРМУВАННЯ СТРАТЕГІЇ ФІНАНСОВОГО РОЗВИТКУ

**Кущик А.П., Кривошеєнко С.В.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
корпоративна стратегія, фінансова стратегія, фінансовий розвиток, критерій оцінки, компоненти стратегії

У статті розглянуто актуальні питання розробки корпоративної фінансової стратегії. Зазначено, що в системі корпоративного управління стратегія фінансового розвитку займає центральне місце, оскільки з її реалізацією пов'язана довгострокова фінансова і економічна політика підприємства. Практично корпоративна фінансова стратегія є ключовим носієм інформації про майбутній розвиток підприємства, на основі якої формується його імідж, залучаються інвестори, підвищується довіра кредиторів. Нові економічні відносини, які створюються на засадах інформаційної економіки, зумовлюють потребу у прогресивних способах і методах управління підприємствами. Формування корпоративної стратегії фінансового розвитку має здійснюватися з урахуванням: впливу факторів зовнішнього та внутрішнього середовища на діяльність підприємства; наявності виробничого, фінансового, маркетингового та кадрового потенціалу. Залежно від цього, підприємства можуть формувати такі фінансові стратегії, які дозволять досягти позитивного результату, зокрема, стабілізувати їх фінансову стійкість, прибутковість, конкурентоспроможність, зберегти певні позиції на ринку. Адже правильний вибір фінансової стратегії є необхідною умовою вдосконалення управління діяльністю підприємств та підвищення ефективності їх діяльності.

## Statement of problem

The components of the enterprise efficiency of any sphere of activity such as high competitiveness, solvency, financial stability, profitability and investment attractiveness are achieved through the implementation of effective financial management. An indispensable prerequisite for ensuring the strategic opportunities for financial development of the enterprise today is its financial strategy, which occupies a key position in the corporate governance system. The balance of corporate interests in the system of corporate management in general and between its important components in particular is the main guarantee of success of a modern enterprise.

All of the above allows us to state the need to substantiate the processes of formation and evaluation of financial strategy and corporate governance of enterprises

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in their relationship, interdependence and interaction in today's dynamic environment. Under such conditions, it is important to study the methodological approaches to the formation of corporate financial strategy and the development of criteria for its evaluation as part of enterprise development

**Analysis of recent studies and publications**

Foreign scientists I. Ansoff, O. Vikhansky, A. Gradov, B. Karloff, M. Porter, A. Strickland, A. Thompson, W. Sharp and others made a significant contribution to the development of strategies. Among the most important modern studies of the problems of financial potential formation and financial strategies of enterprises are the works of the following Ukrainian scientists: M. Bilyk [1], S. Belousova [2], V. Bugay [3], V. Shevchenko [4], V. Yankovska [5] and others. In the works of these authors various aspects of the processes of creating strategies and systems of corporate governance are considered. Problems of theoretical and practical aspects of strategic development of enterprises of the industrial sector were studied by such scientists as Sabluk P.T, Zavadsky J.S, Gudzinsky O.D, Andriychuk V.G and others.

However, a single approach to substantiate the processes of forming a financial development strategy in the corporate management system, taking into account the relationships and interactions between the financial strategy and the enterprise management system is not found. The economic literature does not clearly define not only the essence of financial strategy, but also its place in the enterprise management system. As for Bazyka S.K., she proposes to consider the financial strategy as an organic element of financial regulation of the enterprise [6].

Despite the importance of existing scientific developments, it should be noted that a significant number of problems in the study of this topic remains unresolved, so in particular it is advisable to develop a methodology for comprehensive assessment of financial strategy.

**Objectives of the article**

The purpose of the article is to develop theoretical approaches to the formation of the strategy of financial development of the enterprise and substantiation of the feasibility of implementing a comprehensive integrated system of its evaluation.

In accordance with this goal, a set of key tasks aimed at achieving it are the following to explore the components and features of the formation of the strategy of financial development of the enterprise, to summarize the criteria for its effectiveness, to propose measures to improve the strategy of financial development.

**The main material of the research**

The strategic concept of enterprise development as a fundamental has the idea of effective financial choice. This result can be achieved by implementing a strategy of financial management, which involves the effective achievement of goals by financial methods and means. According to the research of a number of authors (Akoff R., Ammelburg G., Aniskin Y., Ansoff I., Arkhipov V., Bakanov M., Balabanov I.) this strategy is called the financial strategy of enterprise management.

Strategic financial management is a synthesis of such areas of general management theory as strategic management and financial management. In addition, financial strategy is an integral part of the corporate governance system of the enterprise i. e. a form of real implementation of management relationships.

Most authors define the financial strategy of the enterprise as a system of directions of enterprise development, necessary to achieve the goals in the long run, within a certain mission. In general, the corporate financial strategy of the enterprise:

− covers all major aspects of managing the financial resources of the enterprise and the development of its financial relations with partners;

− provides adjustment of sources of formation, directions of placement and using of financial resources which depend on changes of factors of the internal financial environment of the enterprise;

− promotes rapid adaptation to changes that occur in the external financial environment;

− substantiates the strategic guidelines of the financial activity of the enterprise;

− is the basis for making strategic decisions to improve the management of financial resources of the enterprise.

In the economic literature, a different structure of the financial strategy of the enterprise is proposed [7]. Ways and directions of achieving the stated goals are determined in the framework of the formation of individual components (modules) of the financial strategy and its components. The composition of the main components of the financial strategy of the corporation is presented in Fig. 1.

Characteristics of the components of corporate financial strategy are given in table 1.

Corporate financial strategy is developed in the form of a program of financing development and specified in the financial plan (budget) taking into account the necessary changes in the structure of capital and funds for achieving developed strategies for the growth and competitive advantage of the enterprise [8].

Review and generalization of modern approaches to the sequence of development of financial strategy of the enterprise indicate the lack of a single structural construction of this process, which allows us to conclude that it is necessary to streamline. The algorithm for building a corporate financial strategy is presented in Fig. 2.

All stages of the process of forming a corporate strategy of financial development must be performed one after another, according to the proposed algorithm [9].

The most important task of developing a corporate financial strategy is to determine the volume, sources and forms of attracting financial resources for business activities of the enterprise. The development of financial strategy at the enterprise should be carried out according to a certain methodology, which contains a number of defined stages: analysis of the enterprise environment, development of a system of strategic goals, identification of possible options, financial strategy formation, implementation, monitoring and adjustment of financial strategy (Fig. 3).

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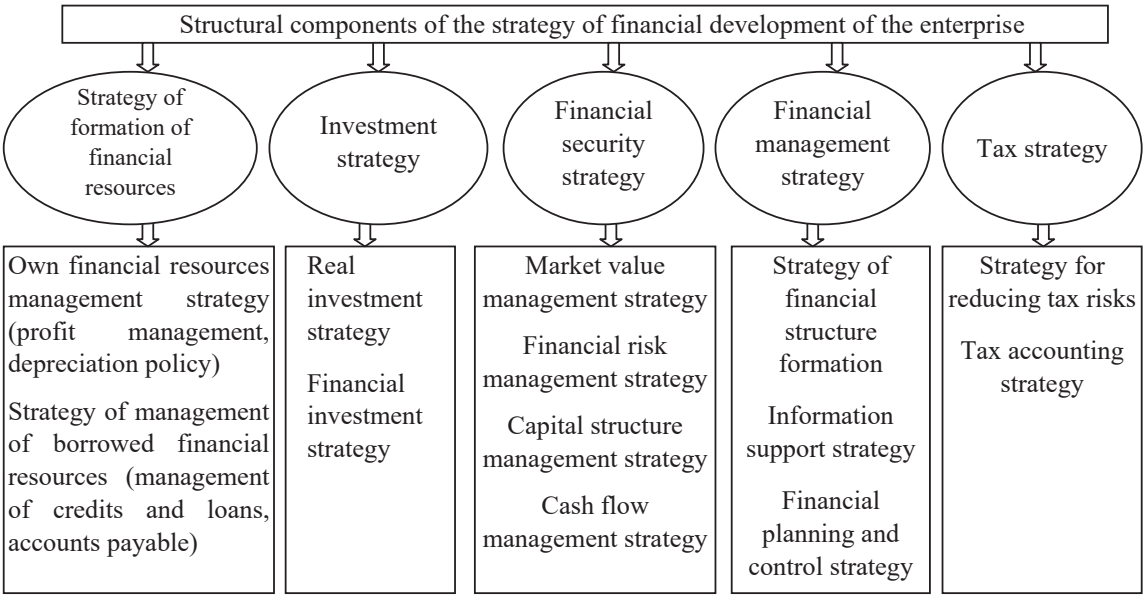


Fig. 1 – The system of components of corporate financial strategy in terms of the main directions of financial development

Table 1 – Characteristics of the components of corporate financial strategy

| **Components of the financial strategy of the enterprise** | **Essence** | **The main strategic objectives** |
|---|---|---|
| Strategy of formation of financial resources | Creating the necessary amount and structure of financial resources, adequate to the development goals, allowing to achieve the strategic attitudes of the firm with the highest efficiency. | Achieving stable growth of own sources of financing; attracting the necessary external financing with minimal costs; optimizing the structure of sources of financial resources and ensuring financial flexibility. |
| Investment strategy | The optimal distribution of investment resources owned by the company, by individual areas and forms of investment. | Ensuring the necessary proportionality of the distribution of investment resources by types and main directions of investment activities of the enterprise; ensuring the necessary proportionality of the distribution of financial resources by strategic business units of the enterprise; ensuring high efficiency of return on investment resources of the enterprise in the process of their use. |
| Financial security strategy | Ensuring a stable financial balance throughout the period of operation of the enterprise. | Identification and assessment of the most significant financial risks and development of a set of measures to neutralize them; ensuring stable solvency and financial stability, implementation of comprehensive solutions in the field of crisis management (both in terms of preventive measures and in terms of actions in the event of signs of crisis). |
| Strategy for improving the quality of financial management | Creating a flexible management system for financial activities, adequate to the long-term goals and objectives. | Creating an effective financial structure; ensuring a high level of qualification and organizational culture of financial managers; introduction and effective use of innovative financial technologies, including methods and tools to model alternative development scenarios and to forecast their financial results. |
| Tax strategy | Making decisions that allow you to optimize the tax burden of the enterprise, preventing the growth of tax risks. | Optimization of the tax burden, which ensures the growth of retained earnings of the company in terms of an acceptable level of tax risks; formation of tax policy with maximum consideration of possible benefits, prevention of fines and overpayments. |

The complexity of strategy formation is due to the need to take into account many dynamic, vague, not always formalized goals and guidelines, there is a likelihood of strategy formation on the basis of conflicting guidelines. Thus, the strategy is a model of goals, actions, capabilities of the enterprise for strategic perspective, on the creation and implementation of which the organization and management of financial and other resources of the enterprise are put down. We must note that the main properties of the corporate financial strategy of any enterprise are its effectiveness, adequacy, reliability, ability to create and maintain long-term competitive advantages of both financial resources and the enterprise as a whole, time orientation, achievability due to the company's potential to its strategic capabilities

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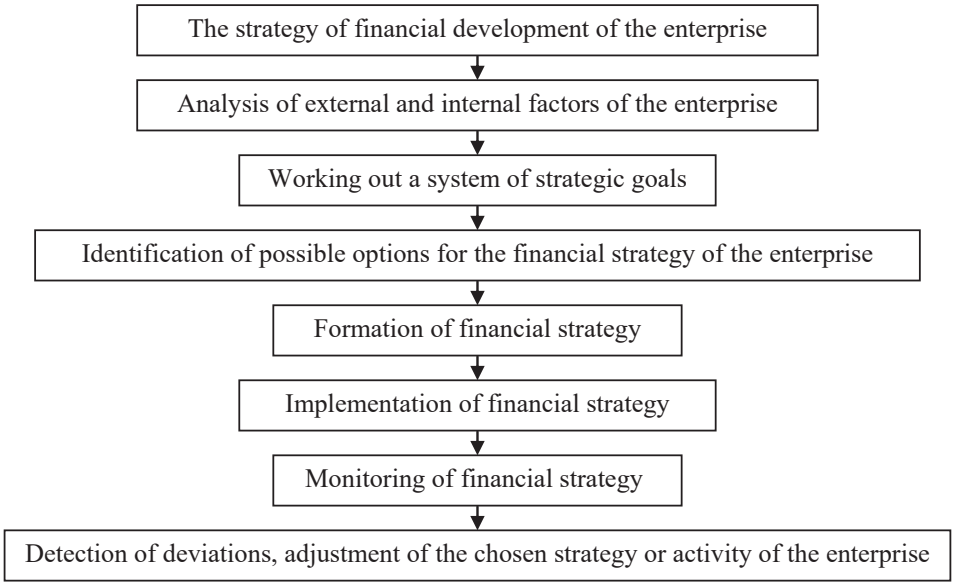


Fig. 2 – Algorithm of corporate strategy of financial development

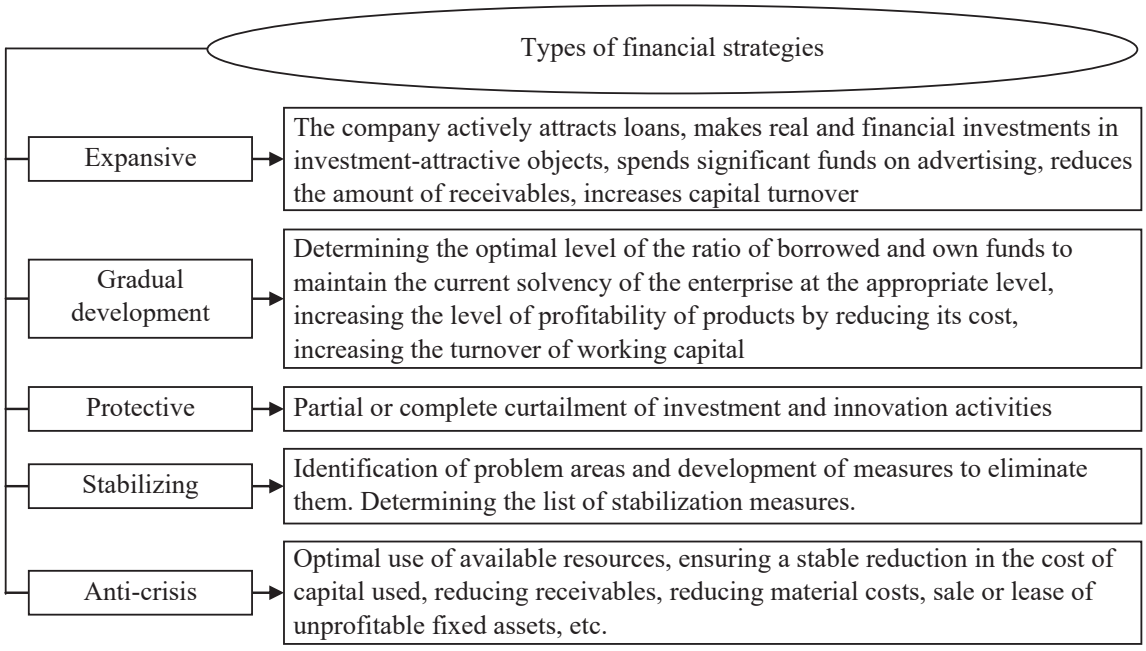


Fig. 3 – Types of corporate financial strategies

functioning and development, planning, systematization, differentiation, flexibility, riskiness [9].

According to research, most scientists propose to divide the criteria for evaluating financial strategy into two groups: those that characterize its properties, and directly the quality criteria. We understand that indicators of the properties of corporate financial strategy are any features that reflect its goals, purpose, content, methods of formation and implementation, deadlines, composition of performers, effectiveness, efficiency, adaptability, connection with other strategies and activities. Quality criteria are indicators that characterize the purposefulness, scientific validity, prospects of corporate financial strategy [3].

It is known that active corporative financial strategy can't be estimated by one generalized index. We think such an estimation can be realized on the basis of obtained results that are reflected in indexes of effective activity of the enterprise (Fig. 4).

The evaluation of the selected performance criteria should be carried out in a complex, as the proposed indicators are interrelated and interdependent. Based on the results of the evaluation, the financial strategy is accepted for implementation or finalized according to the specified criteria. To assess the advantages of one strategy over another (others) and check how it is able to ensure the success of the enterprise, it is recommended to use a system of criteria, table 2.

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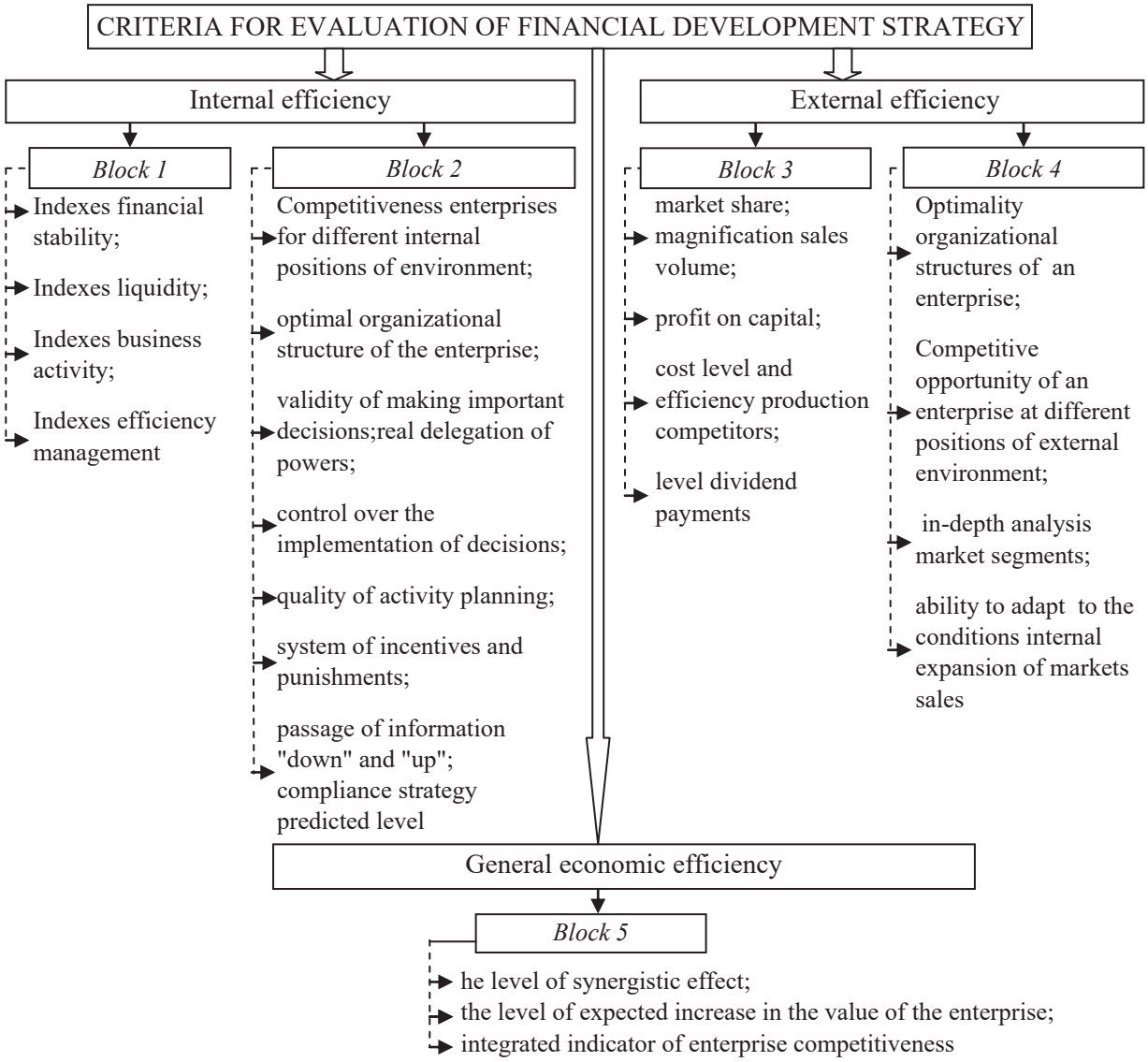


Fig. 4 – Criteria for assessing the effectiveness of the formation and implementation of corporate financial strategy

Table 2 – Criteria for choosing the strategy of the enterprise

| Criterion | Brief description |
|---|---|
| Mental correctness | The strategy should be developed with knowledge and understanding of the two absolute poles of an effective strategy: absolute irrationality (extreme pole) and extreme rationality (opposite pole) |
| Situationality | The strategy should integrate the characteristics of a particular situation into key factors of future (strategic) success |
| Uniqueness (competitive advantage) | The strategy should contain unique (different from existing) opportunities for future business success, which will positively differentiate the company from its competitors and allow it to achieve a stable competitive advantage. The greater the competitive advantage created by the strategy, the more powerful and effective it is |
| Future uncertainty as a strategic opportunity | The strategy must be able to translate changes in the external environment of the enterprise into its strategic and tactical advantages |
| Flexible adequacy (compliance) | The strategy should ensure that the company's own strategic changes are consistent with changes in the external environment |
| The intensity of the enterprise | The strategy should be aimed at reducing the period of time to achieve financial and strategic goals of the enterprise |
| The speed of achieving competitive advantage | The strategy should provide companies with the ability to "accelerate" and "ahead" of competitors |
| Mutual coherence | The strategy should ensure compliance and coherence of all its components |
| Degree of risk | The strategy should aim to reduce the likelihood of risk |

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The criterion allows you to establish the compliance of the strategy with certain characteristics. It should be noted that all these characteristics are not alternative, but, on the contrary, complementary and mutually reinforcing.

During analysis of the literature sources of strategy development by some enterprises it is established that in practice there are two interpretations of the strategy: proclaimed and real. In our opinion, a real strategy is a strategy that consists of the flow of new goods, services, processes in which resources are invested. In this case, we believe that if the values or criteria on which decisions on investment priorities are based do not coincide with the declared (planned) strategy (as it often appears in practice), then the declared by the enterprise strategy and its actual strategy are very different.

**Conclusions**

Thus, corporate financial strategy is an integral part and an important element of the management system of the enterprise, occupying a central place among its functional strategies, determines the main directions of improving the efficiency of its financial management and development of financial relations with counterparties.

The quality of a corporate financial strategy directly depends on the level of its soundness, as well as on the completeness of consideration and assessment of the factors on the basis of which it was developed. Financial strategy plays an important role in the management system of the enterprise, in particular:

− ensures the implementation of financial goals of economic development of the enterprise;

− realistically assesses the financial capabilities of the enterprise, promotes the effective use of its financial potential and active maneuvering of its financial resources;

− ensures the rapid realization of financial opportunities that arise as a result of changes in environmental factors;

− takes into account all possible alternatives to the development of uncontrolled environmental factors and minimizes their negative consequences for the company;

− ensures consistency of the main elements of strategic and operational management of financial activities of the enterprise;

− determines the optimal ways of allocating scarce of financial resources;

− forms the main criteria for evaluating the choice of important management decisions to improve the efficiency of financial activities.

Summing up the study of the essence, functions and elemental structure of corporate financial strategy, it can be argued that the development and implementation of effective financial strategy is the basis for the exit of domestic enterprises from the financial and economic crisis. Note that the main properties of corporate financial strategy are its effectiveness, adequacy, reliability, ability to create and maintain long-term competitive advantages of both financial resources and the enterprise as a whole, time orientation, achievability due to the company's potential to its strategic capabilities.

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# INCREASING THE RATINGS OF THE ECONOMY OF UKRAINE CONSIDERING THE COMPETITIVENESS OF TAX SYSTEM

**Oleinikova L.H.**
*Academy of Financial Management of the Ministry of Finance of Ukraine*
*Ukraine, 01054, Kyiv, O. Honchara str., 46/48*
oleynikova.mila@ukr.net
ORCID 0000-0001-8204-4434

**Key words:**
Rating, category Paying taxes, indicators, number of payments, tax rate, World Bank, ranking, tax system

The Ease of Doing Business Index has been found to provide an objective assessment of the business climate in the countries of the world in terms of the simplicity of the most important administrative procedures for small and medium-sized businesses. The Ease of Doing Business Index has been identified as an annual World Bank study conducted since 2003 and provides objective information for understanding and improving normative and legal regulation of entrepreneurial activity. It is substantiated that the World Bank, in its turn, has developed a set of indicators on the basis of which it evaluates the economic efficiency and quality of the national economy from the standpoint of development of competitive business. This ranking is a global investigation. It is accompanied by a rating of countries around the world by indicator of creating favorable conditions for doing business in each of them. The project assesses and monitors changes in regulations governing the activities of small and medium-sized companies throughout their life cycle - from creation to liquidation. There are 10 indicators of business regulation, which take into account the time and cost of the entrepreneur's compliance with state requirements for registration of a new enterprise and its activities, conducting trade operations, ensuring the implementation of contracts, taxation and liquidation of the enterprise, which allows to determine the rating of business assistance. The indicators are equilibrium. Such variables herewith are not taken into account as macroeconomic policy, infrastructure quality, labor skills, exchange rate fluctuations, investor opinion, security and corruption. The dynamics of Ukraine's place in the Doing Business ranking in 2012-2020 is analyzed. Proposals are made to reduce significantly the number of payments, further increase Ukraine's ratings in the category Paying taxes.

# ПІДВИЩЕННЯ РЕЙТИНГІВ ЕКОНОМІКИ УКРАЇНИ З УРАХУВАННЯМ КОНКУРЕНТОСПРОМОЖНОСТІ ПОДАТКОВОЇ СИСТЕМИ

**Олейнікова Л.Г.**
*ДННУ «Академія фінансового управління»*
*Україна, 01054, м. Київ, вул. О. Гончара, 46/48*

**Ключові слова:**
Рейтинг, категорія «оподаткування», індикатори, кількість платежів, податкова ставка, Світовий банк, ранжування, податкова система

Встановлено, що індекс легкості ведення бізнесу (Ease of Doing Business Index) надає об'єктивну оцінку бізнес-клімату в країнах світу з погляду простоти найважливіших для малого і середнього бізнесу адміністративних процедур. Визначено, що індекс легкості ведення бізнесу – щорічне дослідження групи Світового банку, що розраховується з 2003 р. і дає об'єктивну інформацію для розуміння і вдосконалення нормативно-правового регулювання підприємницької діяльності. Обґрунтовано, що світовий банк, у свою чергу, розробив набір індикаторів, на підставі яких здійснює оцінку економічної ефективності та якість середовища національної економіки з позиції розвитку конкурентоспроможного бізнесу. Цей рейтинг являє собою глобальне дослідження. Його супроводжує рейтинг країн світу за показником створення в кожній із них сприятливих умов ведення бізнесу. В межах проекту оцінюються й відстежуються зміни нормативно-правових актів, котрі регулюють діяльність малих і середніх компаній протягом усього їх життєвого циклу – від створення до ліквідації. Виокремлено 10 індикаторів регулювання підприємницької діяльності, які враховують час і вартість виконання підприємцем вимог держави щодо реєстрації нового підприємства і його діяльності, проведення торговельних операцій, забезпечення виконання контрактів, оподаткування й ліквідації

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підприємства, що дозволяє визначити рейтинг сприяння ведення бізнесу. Індикатори є рівноважними. При цьому не враховуються такі змінні, як макроекономічна політика, якість інфраструктури, кваліфікація робочої сили, коливання валютних курсів, думки інвесторів, безпека й рівень корупції. Проаналізовано динаміку зміни місця України в рейтингу Doing Business у 2012-2020 рр. Внесено пропозиції щодо суттєвого зменшення кількості платежів, подальшого підвищення рейтингів України в категорії «оподаткування».

**Analysis of recent researches and publications**

The impact of globalization on the change of the above mentioned competencies has led to the emergence of «hypercompetition» – a new economic category introduced by R. D'Aveni, who believes that hypercompetition is a «specific environment characterized by intense and rapid competitive activities in which participants need to quickly respond to generate new competitive advantages and at the same time reduce the advantages of their competitors» [1, p. 218]. Hypercompetition defines the next level of competition, which is based on innovation, technologies, information and human capital, which are constantly changing the competences of relations in the global environment.

Therefore, in order to increase the competitiveness of the tax system, the works of domestic financiers are analyzed, who study the problematic issues of ensuring a high level of rating of countries in the category of «taxation», namely the works of Bigun U.V. [8], Boiko O.V. [8], Herasymenko A.V. [2], Efymenko T.I. [3; 4; 5], Kelichavyi A.V. [6], Kucher A.V. [7], Sych E.M. [8], Kharchuk T.V. [9].

**The purpose of the article**

Make proposals based on in-depth analysis for significant reduction in the number of payments, further increase of Ukraine's ratings in the category Paying taxes.

**Presentation of the main material**

In the final rating «Ease of Doing Business» countries are ranked by the promotion for doing business. The country's high position means that its regulatory climate has a positive effect on doing business. The level of assistance is the average index of the country on 9 indicators, each of which has equal value.

Main indicators are: Starting a Business, Dealing with Construction Permits, Registering Property, Getting Credits, Protecting Minority Investors, Paying Taxes, Trading across Borders, Getting Electricity, Enforcing Contracts, Resolving Insolvency.

According to the World Bank methodology, three indicators are used to assess the administrative and tax burden on business entities:

– number of payments per year;

– time spent on tax reporting and payment of basic taxes;

– total tax and contribution rate (% of profit).

Each of the indicators by 1/3 affects the country's place in the rating Ease of Doing Business, so it is equally important in the formation of the overall rating in the category of «taxation».

It is worth noting that when compiling the rating there is a certain time lag of the period of its publication and the statistics on which it is calculated. Thus, the rating «Doing Business – 2011» did not take into account the reforms implemented in 2010–2011. To compile it the period from June 2009 to June 2010 was used – the initial stage of reforming the tax system. The rating «Doing Business – 2015» was formed on the basis of data for June 2013 – June 2014. Thus, the rating takes into account the reforms implemented in the countries with a time lag of 1.5 years.

According to the generalized assessment of the World Bank, in the rating «Doing Business – 2015» Ukraine ranked 96$^{th}$ out of 189 countries, which is 16 points higher than in the previous report (in 2014–112$^{th}$ place), while in the 2020 report it is 64$^{th}$ place. The Doing Business 2020 rating is more indicative in terms of assessing the reforms implemented in Ukraine than the ratings of previous years than, for example, the 2013–2015 data, as it already includes major changes introduced in the last six years due to improvements in Ukraine's Tax Code and active work to prevent the erosion of the tax base and the profits shifting under the BEPS Action Plan.

This increase in the overall rating of «Ease of Doing Business» of Ukraine was due to an raise in positions in such categories as:

– starting a Business (from the 76$^{th}$ – in 2015 to the 61$^{st}$ – in 2020);

– dealing with Construction Permits (from the 70$^{th}$ – in 2015 to the 20$^{th}$ – in 2020);

– getting Electricity (from 185$^{th}$ in 2015 to 128$^{th}$ in 2020);

– protecting Minority Investors (from 109$^{th}$ place in 2015 to 45$^{th}$ in 2020);

– trading across Borders (from 154$^{th}$ place in 2015 to 74$^{th}$ in 2020);

– paying Taxes (from 108$^{th}$ place in 2015 to 65$^{th}$ in 2020).

Analyzing the dynamics of change in Ukraine's place in the Doing Business ranking in 2012–2020, we can note the presence of positive changes. There was a significant increase in Ukraine's ratings not only in the category Paying Taxes, but in almost all categories, but in 2020 there is a slight deterioration in indicators such as Registering Property and Getting Credits, as well as indicators Enforcing Contracts, Resolving Insolvency (Table 1).

The country regained its lost position in the rankings after the crisis, improving its indexes as a result of reforms in three areas of enterprise regulation. However, despite this rise, Ukraine still loses to many countries compared, and, for example, some changes in Belarus and Kazakhstan were included in the list of world best practices for the year. Ukraine's relatively strong positions are in Starting a Business, Dealing with Construction Permits, Registering Property and

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Table 1 – Ukraine's place in the Doing Business ranking

| Rating by categories | Business rating 2012 (183) | Business rating 2013 (185) | Business rating 2014 (189) | Business rating 2015 (189) | Business rating 2016 (189) | Business rating 2017 (190) | Business rating 2018 (190) | Business rating 2019 (190) | Business rating 2020 (190) |
|---|---|---|---|---|---|---|---|---|---|
| **Overall rating** | **152** | **137** | **112** | **96** | **83** | **80** | **76** | **71** | **64** |
| Starting a Business | 112 | 50 | 47 | 76 | 30 | 20 | 52 | 56 | 61 |
| Dealing with Construction Permits | 180 | 183 | 41 | 70 | 140 | 140 | 35 | 30 | 20 |
| Getting Electricity | 169 | 166 | 172 | 185 | 137 | 130 | 128 | 135 | 128 |
| Registering Property | 166 | 149 | 97 | 59 | 61 | 63 | 64 | 63 | 61 |
| Getting Credits | 24 | 23 | 13 | 17 | 19 | 20 | 29 | 32 | 37 |
| Protecting Minority Investors | 111 | 117 | 128 | 109 | 88 | 70 | 81 | 72 | 45 |
| Paying Taxes: | 181 | 165 | 164 | 108 | 107 | 84 | 43 | 54 | 65 |
| *– number of payments* | 135 | 28 | 28 | 5 | 5 | 5 | 5 | 5 | 5 |
| *– time spent (hours)* | 657 | 491 | 390 | 350 | 350 | 355,5 | 327,5 | 327,5 | 328 |
| *– total tax and contribution rate, (% of profit)* | 57,1 | 55,4 | 54,9 | 52,9 | 52,2 | 51,9 | 37,8 | 41,7 | 45,2 |
| Trading across Borders | 140 | 145 | 148 | 154 | 109 | 115 | 119 | 78 | 74 |
| Enforcing Contracts | 44 | 42 | 45 | 43 | 98 | 81 | 82 | 57 | 63 |
| Resolving Insolvency | 156 | 157 | 162 | 142 | 14 | 150 | 149 | 145 | 146 |

Source: compiled according to: [11, p. 142; 12, p. 202; 13, p. 232; 14, p. 226; 15, p. 242; 16, p. 247; 17, p. 201; 18, p. 211; 19]

Enforcing Contracts. At the same time, the main problem areas that complicate the development of business in Ukraine are Getting Electricity (128th place), Trading across Borders (74th place), Resolving Insolvency (146th place) [10].

Data of Table 2 show that in the European Union countries the total number of payments varies from 8 units to 16 units in Cyprus with total time spent on tax payments from 50 hours in Estonia until 334 hours in Poland. It

Table 2 – Ratings of countries by category Paying Taxes in 2020

| Country | Place in the ranking (among 190 countries) | Evaluation criteria (indicators) | | |
|---|---|---|---|---|
| | | Total number of payments, per year | Total time spent, hours | Total tax and contribution rate, (% of profit) |
| *Countries EU-10* | | | | |
| Estonia | 12 | 8 | 50 | 47,8 |
| Cyprus | 29 | 16 | 120 | 22,4 |
| Latvia | 16 | 7 | 169 | 38,1 |
| Lithuania | 18 | 10 | 95 | 42,6 |
| Poland | 77 | 7 | 334 | 40,8 |
| Slovakia | 55 | 8 | 192 | 49,7 |
| Slovenia | 45 | 10 | 233 | 31,0 |
| Hungary | 56 | 11 | 277 | 37,9 |
| Czech Republic | 53 | 8 | 230 | 46,1 |
| Malta | 78 | 8 | 139 | 44,0 |
| *Countries of Europe and Central Asia* | | | | |
| Azerbaijan | 40 | 9 | 159 | 40,7 |
| Belarus | 99 | 7 | 170 | 53,3 |
| Armenia | 52 | 15 | 264 | 22,6 |
| Georgia | 14 | 5 | 216 | 9,9 |
| Kazakhstan | 64 | 10 | 186 | 28,4 |
| Moldova | 33 | 10 | 183 | 38,7 |
| Russian Federation | 58 | 9 | 159 | 46,2 |
| Tajikistan | 139 | 7 | 224 | 67,3 |
| Uzbekistan | 69 | 9 | 181 | 31,6 |
| **Ukraine** | **65** | **5** | **328** | **45,2** |
| *Countries of Asia* | | | | |
| Taiwan, China | 39 | 11 | 221 | 36,8 |
| India | 15 | 11 | 252 | 49,7 |
| Republic of Korea | 21 | 12 | 174 | 33,2 |
| Singapore | 2 | 5 | 64 | 21 |

Source: compiled according to: [20, p. 37–40; 21, p. 37–40; 22, p. 37–40; 23, p. 37–40]

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should be noted that the total tax rate 49.7 in Slovakia is higher than the average index for Europe and Central Asia and higher than the average index for contries of OECD (41.3%), which is a signal for further improvement of Ukraine's tax system in terms of tax rates of basic taxes and fees.

Ukraine's rating in the category Paying Taxes in 2011–2015 has a stable positive dynamics both as a whole and by individual indicators. This is mainly due to the adoption of the Tax Code of Ukraine (hereinafter – TCU) in 2011, which was reflected in the rating indicators in 2013 (according to the methodology of the World Bank), as well as further improvement of its norms and rules of taxation, positive changes in administration, introduction of electronic services and reporting.

The positive impact of the implementation of the TCU is confirmed by the forecast of rating indicators for the category of taxation, made by us in the study of the impact of this event on economic entities and international assessment.

**Conclusions**

A further increase in Ukraine's ratings in the category Paying Taxes is expected. The prerequisite for this is the implementation of such positive steps in the system of administration of taxes, fees and mandatory payments, as:

– introduction of a risk-oriented control system into the practical plane, which affected the number of inspections and the quality of payer selection;

– establishment of a system of automatic VAT refund and registration of tax invoices;

– possibility for payers to submit remotely the reports on individual taxes (VAT, income tax);

– opening of payer service centers in all regions of Ukraine;

– perfectibility of the electronic service for the provision of electronic services to taxpayers – «Electronic Cabinet of Taxpayers», including for individuals and individual entrepreneurs; which with the help of a special access tool (for example, an electronic card of the payer) with the use of electronic-digital signature allows to work with the tax authorities in real time to a wide range of taxpayers, etc.

These steps improve qualitatively control, simplify administrative procedures and are positively perceived by taxpayers.

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# METHODOLOGY OF ASSESSMENT OF FINANCIAL RISKS OF INSURANCE COMPANIES OF UKRAINE

**Shcheblykina I.A., *Shcheblykina Z.V., Danilova O.A.**
*Zaporizhzhia National University*
*Ukraine,69600, Zaporizhzhia, Zhykovsky str., 66*
**Bogdan Khmelnitskiy Melitopol State Pedagogical University*
*Ukraine, 72300, Melitopol, Getmanska str., 20*
innasheblykina@gmail.com
ORCID: 0000-0002-3214-8478, 0000-0002-4886-5850, 0000-0002-0080-7395

**Key words:**
risk, insurance company, financial risk, financial condition, financial ratios, stability, diversification, balance sheet, business activities

This article defines the classification of financial risks of an insurance company in the conditions of functioning of the Ukrainian market of insurance products and gives a list of appropriate methods for each type of risk. Dedicated definition of «risk management». Specific risk management tasks for insurance companies are highlighted. Methods of managing and minimizing risks of insurance companies are described. Methods of compensation of financial risks of insurance companies are investigated. Possible causes of such risks have been identified. The factors of the financial crisis in the insurance company are indicated. Analyzed models for assessing the bankruptcy of insurance companies, namely: Ukrainian models or those models that take into account the specifics of enterprises in Ukraine and models that should be used in analyzing the activities of the insurance company, taking into account its financial statements. The models of bankruptcy risk assessment – Tereshchenko's model and Zaytseva's model, as models that take into account the specifics of the functioning of Ukrainian enterprises, are designed either for the Ukrainian market or for the entire post-Soviet space. A comprehensive analysis of the formulas for analyzing the possibility of bankruptcy of enterprises and identified those that are correct for use with the reporting of insurance companies operating in the market of insurance services in Ukraine. It is noted that among the methods of eliminating the risks inherent in the insurance company, we can highlight the following: risk limitation; risk distribution; reservation of funds; collecting information on future events and results. It is investigated that to minimize the existing financial risks, which cannot be completely eliminated in the insurance company, such methods are used as risk avoidance; risk localization.

# МЕТОДОЛОГІЯ ОЦІНКИ ФІНАНСОВИХ РИЗИКІВ СТРАХОВИХ КОМПАНІЙ УКРАЇНИ

**Щебликіна І.О., *Щебликіна З.В., Данилова О.А.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*
**Мелітопольський державний педагогічний університет імені Б. Хмельницького*
*Україна, 72300, м. Мелітополь, вул. Гетьманська, 20*

**Ключові слова:**
ризик, страхова компанія, фінансовий ризик, фінансовий стан, фінансові коефіцієнти, стійкість, диверсифікація, баланс, діяльність суб'єктів господарювання

У даній статті визначена класифікація фінансових ризиків страхової компанії в умовах функціонування українського ринку страхових продуктів та приведений перелік відповідних методів за кожним видом ризику. Виділене визначення поняття «ризик менеджмент». Виділено специфічні завдання управління ризиками для страхових компаній. Охарактеризовані методи управління та мінімізації ризиків страхових компаній. Досліджено методи компенсації фінансових ризиків страхових компаній. Виявлені можливі причини настання таких ризиків. Зазначено чинники настання фінансової кризи у страховій компанії. Проаналізовані моделей оцінки настання банкрутства страхових компаній, а саме: українські моделі або ті моделі, що враховують специфіку функціонування підприємств на території України та моделі, які доцільно використовувати при аналізі діяльності страхової компанії, з урахуванням особливостей її фінансової звітності.

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Досліджені моделі оцінки ризиків настання банкрутства – модель Терещенко і модель Зайцевої, як моделей, що враховують специфіку функціонування українських підприємств, розраховані або саме на український ринок, або на весь пострадянський простір. Проведено комплексний аналіз формул аналізу можливості банкрутства підприємств і виділено ті, що є коректними для використання зі звітністю страхових компаній, які функціонують на ринку страхових послуг України. Зазначено, що серед методів усунення ризиків, які притаманні страховій компанії, можна виокремити такі: лімітування ризиків; розподіл ризику; резервування коштів; збір інформації щодо майбутніх подій та результатів. Досліджено, що для мінімізації наявних фінансових ризиків, які неможливо повністю усунути у страховій компанії, застосовуються такі методи, як ухилення від ризиків; локалізація ризиків.

**Statement of the problem**

Unlike ordinary companies, insurance companies, firstly, have financial risks associated with the operation and operation of the enterprise as an independent entity, and secondly, the insurance company has accepted risks, namely the risks taken to service specific risks (portfolio of risks) from individuals and legal entities and risks accepted for reinsurance from other insurance companies, insurance companies and associations. Preventing the risks of the insurance company is not only an effective way to manage the company's activities, but also the direct operational activities, the purpose of the enterprise. Thus, for this type of financial entities, the economic problem covered in this course work is very relevant and has the highest practical significance.

**Analysis of recent studies and publications**

Financial market activities are always associated with certain risks. Financial risks can be related to the activities of the entity, as well as may exist objectively, regardless of the entity's wishes and arise due to changes in the economy (for example, due to cyclical economic development, government fiscal and monetary policy measures, etc.). In this regard, the problems of minimizing financial risks, the causes and factors of their occurrence are devoted to the work of such scientists as: Tkachenko A.M., Yakos I.S., Ponomarenko T.V., Gerasimova I.Y., Tereshchenko O.O., Zhikhor O.B., Balyasna Yu. S., Ryasnykh E.G. etc. Despite the significant contribution of these scientists, it should be noted the need for further research on the assessment of financial risks that arise in the course of insurance companies.

**Objectives of the article**

The purpose of the article is to analyze the financial risks of business entities – insurance companies, as well as possible ways to control and overcome these risks with a preliminary study of the correct methods of assessment and control, to find possible ways to improve existing risk management measures.

**The main material of the research**

For integrated financial risk management, an entity, in our case an insurance company, must properly assess all risks present in the enterprise, identify target risks that need to be eliminated (provided that these risks are completely eliminated) or containment (provided that the risks cannot be eliminated permanently). To properly analyze the financial risks of the entity must adhere to a clearly defined regulatory sequence, namely: identify the causes of fluctuations in the amount of specific risk studied, analyze the identified factors, assess financial performance related to this type of risk, set the maximum allowable level for of the studied risk, to analyze individual, targeted operations of the entity under the conditions of the selected maximum allowable level of risk and, as a last point, to develop or improve existing measures to reduce risks [1].

Analysis of the financial condition of enterprises, in particular insurance companies, is formed by four main methods: vertical, horizontal, trend and ratio. Several methods can be used in one analysis table.

According to the general classification of risk analysis methods, financial risk analysis methods are divided into qualitative and quantitative analysis, which in turn is divided into economic-statistical, calculation-analytical, expert and analog. variations and others. The difference between these methods should also be noted. In turn, the calculation and analytical methods of calculating the financial risks of the entity are the most common, as they are simplified for general understanding, developed and derived to universal formulas and operate simple economic concepts. This method includes: analysis of the stability of the enterprise, cost recovery and break-even analysis.

The normative method is a set of basic financial ratios. A positive feature of this method is the convenience and simple technology of calculating the coefficients by this method. The presence of risk of financial stability is determined by the coefficients: solvency, debt, autonomy, financial stability, financial leverage and self-sufficiency [2]. To assess the availability of credit and internal solvency risks of the insurance company, the following ratios are used: total liquidity, term liquidity, absolute liquidity and maneuverability of own funds. Currency risk is studied by observing the dynamics of fluctuations in foreign exchange rates, provided that the company has some financial settlements in currencies other than national, may also purchase equipment, etc. [1; 3].

Currency risk is studied by observing the dynamics of fluctuations in foreign exchange rates, provided that the company has some financial settlements in currencies other than national, it is also possible to purchase equipment and so on. Almost the same can be said about interest rate, price and tax risks. As these are external risks, we can only

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observe fluctuations in interest rates, tax and fee rates and overall pricing in the insurance market and minimize losses from sharp fluctuations in these indicators by providing sufficient reserves.

The financial management of the entity is the driving force behind the life and development of the enterprise. In turn, one of the most important elements of this process is the management of financial risks, which is ensured by the development and implementation of a model of control and management of existing (characteristic) financial risks at the enterprise. Such control is separated into the functional and organizational unit of financial management. Also in the economic literature it is often distinguished as «risk management» (Risk Management).

The system of methods and measures for risk management and control is mainly internal methods. It is the internal mechanisms of control and elimination of financial risks that are the system of reducing the negative consequences that are inherent and have been identified in the enterprise. Internal minimization measures address almost all possible risks (full risk-portfolio). The appropriate use of internal mechanisms is due to the great flexibility and speed in the adoption, implementation and implementation of anti-risk measures perspective risks, decision-making is determined by the specifics of the studied enterprise, its financial capabilities, market position, structural organization, and its implementation is more efficient and appropriate [4].

The main task of the management staff of the enterprise after identifying existing financial risks is prompt and effective elimination (or minimization, in the absence of the possibility of complete elimination). The following methods can help to eliminate risks: insurance, limitation, risk allocation, diversification, provisioning of funds (formation of trust funds) in favor of unforeseen costs, as well as gathering information about future choices and its results.

Insurance is one of the most common methods of managing financial risks for businesses (in countries where the insurance system operates), but at the same time this type of insurance is more complex and problematic due to the process of its organization. According to the Law of Ukraine «On Insurance», this type of insurance refers to voluntary insurance, as well as property [5]. However, despite the distribution of characteristics, the legislation does not have a clear definition of «financial risks». The maximum allowable limit on possible costs in the event of a risk outcome.

A method such as diversification is to reduce risks, including financial, by allocating cash between this risk and other risks that are less likely to occur or less costly if incurred. Reservation as a method of controlling and eliminating financial risks accumulation of a certain calculated amount of money, which is purposefully accumulated to cover possible risks and in case of a certain risk, a certain amount of money from this reserve fund is spent to cover these costs. in comparison with other methods listed above and is mostly subjective.

In turn, slightly different methods are used to minimize the financial risks of business entities (Table 1).

If the occurrence of adverse financial events (financial risks) within the entity cannot be overcome or reduced for the most part for the occurrence of a favorable situation for further operational activities, the so-called methods of compensation of financial risks are used, namely:

- creation of mutual support and assistance funds or associations between autonomous divisions of companies or partner companies;
- reservation of a share of free financial assets of the enterprise to provide a «financial cushion» or self-insurance in case of need;
- fight against industrial and economic espionage, sabotage;
- introduction of a system of fines and incentives for operational actions to overcome cases of occurrence or prevention of financial risks;
- extraordinary issue of preferred shares (additional financing);
- implementation or improvement of the strategic planning process, revision and redistribution of plans based on previous mistakes;
- development of a new or improvement of the existing marketing system;
- lobbying for state bills to protect business from certain types of risks, support small, medium and large businesses in conditions of uncertainty and the presence of large risks [8].

In case of imperfect management of the insurance company, there may be a threat of bankruptcy, which may lead to the complete closure of the insurance company.

The factors of the financial crisis in the insurance company include: incorrectly performed actuarial calculations; errors in the calculation of acceptable risks for reinsurance; risky ways of investing temporarily free funds owned by the insurance company or accepted for temporary maintenance; formation of reserves in

Table 1 – Methods of minimizing risks in financial management

| Method | Characteristic |
|---|---|
| Risk dissipation | Carried out by diversifying the activities of the enterprise. |
| Avoidance of risks | Refusal to cooperate with unreliable partners, refusal to work on risky projects, search for guarantors. |
| Risk localization | Demarcation of the system of rights and responsibilities so that the consequences of risk situations do not affect the implementation of management decisions. |
| Minimize risks or keep risk within acceptable limits | – determining the minimum size of highly liquid assets of the enterprise, setting the maximum amount of borrowed funds in business;<br>– limiting the concentration of risks;<br>– obtaining certain guarantees from counterparties in the provision of commercial loans and borrowings; setting the maximum amount of a deposit placed in one bank. |

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insufficient quantities to ensure the stability of the insurance company; the presence of an unbalanced insurance portfolio, which will further stimulate increased risks; incurring significant losses on insurance and investment activities of the company. All these factors increase the insurance company's losses or disrupt its balance sheet structure in such a way that the company will gradually lose its competitiveness and solvency until the moment of complete bankruptcy.

Due to the special specifics of the operation of the company under study, among all the models for assessing the onset of bankruptcy, we need to highlight:

- namely Ukrainian models or those that take into account the specifics of the operation of enterprises in Ukraine;

- models that should be used in the analysis of the insurance company, the features of its financial statements.

After analyzing the existing models for assessing the risks of bankruptcy (both domestic and generally accepted foreign) can be identified as appropriate to use in this case, the following models: Tereshchenko model [7] and Zaitseva model [8]. These models take into account the specifics of the functioning of Ukrainian enterprises, designed either for the Ukrainian market or for the entire post-Soviet space.

Regarding Tereshchenko's model, it should be noted that it is based on analytical data of the national economy taking into account the industry affiliation and structure of enterprises, industry reference values of coefficients in the model allows to identify crises in enterprises in various sectors of the national economy. But despite the fact that this model is the most popular for use in Ukraine, it has several negative features: it shows the exclusive presence or absence of a crisis in the company relative to the calculated financial indicators, which makes it impossible to diagnose early pre-crisis phenomena. integrated indicator from – 0,9 to 0,9 does not provide high accuracy in assessing the financial condition of the enterprise.

Model Tereshchenko O.O. is determined by the formula:

$$Z = 1{,}5X_1 + 0{,}08X_2 + 10X_3 + 5X_4 + 0{,}3X_5 + 0{,}1X_6, \quad (1)$$

where $X_1$ is the ratio of cash receipts to liabilities; $X_2$ – the ratio of balance sheet currency to liabilities; $X_3$ – the ratio of net income to the average annual amount of assets; $X_4$ – the ratio of profit to revenue; $X_5$ – the ratio of inventories to revenue; $X_6$ – the ratio of revenue to fixed capital.

The obtained values of $Z$ can be integrated as follows: $Z > 2$ – the company is financially stable and it is not threatened with bankruptcy; $1 < Z < 2$ – the company has disturbed the financial balance (financial stability), but it is not threatened with bankruptcy if the transition to crisis management; $0 < Z < 1$ – the company is threatened with bankruptcy if it does not take remedial action; $Z < 0$ – the company is semi-bankrupt.

Zaitseva's model has the advantage that it is easy to calculate and also suitable for use by companies that are not issuers of securities or have stopped issuing new ones for a long time. Also, the condition for using this model is that it is relevant for companies that are already in a state of crisis. In many publications, this feature of this model is described as its disadvantage, but in the case of this study it will be appropriate. Zaitseva's model for assessing the risk of bankruptcy of the enterprise is as follows:

$$K = 0{,}25X_1 + 0{,}1X_2 + 0{,}2X_3 + 0{,}25X_4 + 0{,}1X_5 + 0{,}1X_6, \quad (2)$$

where $X_1$ – Coop (loss ratio of the enterprise, characterized by the ratio of net loss to equity); $X_2$ – *Kz* (ratio of accounts payable and receivable); $X_3$ – *Ks* (ratio of short-term liabilities and most liquid assets, this ratio is the inverse of the absolute liquidity ratio); $X_4$ – Chickens (loss of sales of products, characterized by the ratio of net loss to sales of these products); $X_5$ – *CFL* (financial leverage ratio (financial risk) – the ratio of borrowed capital (long-term and short-term liabilities) to own sources of financing); $X_6$ – *Kzag* (asset load factor as a value inverse of the asset turnover ratio, – the ratio of total assets of the enterprise (balance sheet currency) to revenue).

To determine the probability of bankruptcy, it is necessary to compare the actual value (*Kfact*) with the normative value (*Kn*), which is calculated by the following formula:

$$Kn = 0{,}25 \times 0 + 0{,}1 \times 1 + 0{,}2 \times 7 + 0{,}25 \times 0 + 0{,}1 \times 0{,}7 + 0{,}1 \times X_6. \quad (3)$$

If the actual coefficient is higher than the normative (*Kfact* > *Kn*), then the probability of bankruptcy is extremely high, and if less, the probability of bankruptcy is negligible.

All other domestic models (such as the model of the Ministry of Finance of Ukraine, IDEA) and foreign models can't be used due to lack of data required for the calculation or incorrectness of these calculations due to the specifics of some indicators of the insurance company.

## Conclusions

Financial risks are present in all companies that have their own financial structure, budget, income and expenses – this is an integral part of their economic activity. But despite the presence of such a factor as risk, all still have some inequality in the formation and amount of financial risks available to enterprises. Such inequality is formed due to many factors, but the fundamental and cardinal is the specifics of the sphere of work of enterprises.

Regarding the methods of eliminating the risks inherent in the insurance company, we can highlight:

– risk limitation, at this enterprise, as well as at all other insurance companies, the general limit on quantity of risks in service (both in quantitative, and in monetary terms), and also a limit of the maximum admissible volume of an insurance portfolio (and each risk) is established. separately), which can be accepted from one client);

– risk allocation (this term can be understood as a common practice for insurance, namely reinsurance – providing part (the difference between the amount of risk and the limit that can take on the processing of the insurance company) taken for insurance risk to another insurance company to share responsibility for this risk in the event of an insured event);

– reservation of funds (is also a common and mandatory method of eliminating financial risks in insurance activities;

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is to create a reserve fund, the money from which will be used in the event of an excessive number of insured events);

– the process of forming forecasts for future trends in the occurrence of insured events, which serves as a basis for further application of methods of limitation and reservation).

The following methods are also used to minimize the existing financial risks that cannot be completely eliminated at the enterprise:

– risk avoidance (this refers to the stage of consideration of clients' applications for acceptance of their risks for processing by the insurance company. At this point the company assesses the client's risks in detail and decides whether it is appropriate to accept such risk, whether it will be possible in the event of an insured event and then provides the result to the client in the form of consent or evasion of acceptance for processing of this risk);

– localization of risks (choosing the maximum amount of coverage that the company can pay (in terms of processing the risk) or lose (in case of risk from the activities of the enterprise itself), each maximum amount of payments is calculated for each risk separately After choosing the maximum amount of payments, the company has no right to exceed it).

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# LABOUR ECONOMICS, PERSONNEL MANAGEMENT AND MARKETING

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## MODERN PERSONNEL MANAGEMENT SYSTEMS

**Dashko I.M., Krylov D.V., Sierova V.Yu.**
*Zaporizhzhia National University*
*Ukraine,69600, Zaporizhzhia, Zhykovsky str., 66*
irina.znu@i.ua, vladaserova605@gmail.com
ORCID: 0000-0001-5784-4237, 0000-0001-8522-5433, 0000-0001-5784-4237

**Key words:**
management, economy, marketing, liberal type, totalitarian model, democratic system, authoritarian system, stages of personnel management, coaching, SMART system

In our world, every system involves the formation of something new. This applies to business, social norms, management and socio-economic processes in general. Management in the economic system plays a very important role, but perhaps the personnel management is the most important of these components. Risks that arise both in starting your own business and in creating ideal competition in the labor market should be analyzed and predicted by a management specialist. Modern personnel management systems involve the choice of their own behavior according to the team. It depends on the tasks of the enterprise, as well as on the nature of the businessman. There are currently four main patterns of behavior: liberal, totalitarian, democratic, and authoritarian. The article analyzes the behavior of professionals who start their own business. Then, at the very beginning of the case, first individual and then collective responsibility is formed. The results of this study can be used as for attracting new management decisions to create a more competitive business, as well as for increasing employee productivity and reducing the negative consequences that could result from the wrong approach to employees, and also the fact that there are still Soviet or outdated methods of improving work.

## СУЧАСНІ СИСТЕМИ УПРАВЛІННЯ ПЕРСОНАЛОМ

**Дашко І.М., Крилов Д.В., Сєрова В.Ю.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
управління, економіка, маркетинг, ліберальний тип, тоталітарна модель, демократична система, авторитарна система, етапи управління персоналом, коучинг, система SMART

Встановлено, що управління в системі економіки відіграє дуже важливу роль, але можливо, найважливішим із цим компонентів є управління персоналом. Доведено, що ризики, які постають і при утворенні власного бізнесу, і при створенні ідеальної конкуренції на ринку праці потрібно аналізувати і прогнозувати спеціаліст з управління. Визначено, що сучасні системи управління персоналом передбачають вибір власної поведінки згідно колективу. Це залежить від завдань підприємства, а також від характеру бізнесмена. Нині існує чотири основних моделі поведінки: ліберальна, тоталітарна, демократична і авторитарна. У статті проаналізована поведінка спеціалістів, які починають свою справу. Тоді, вже на самому зародженні справи – утворюється спочатку індивідуальна, а потім колективна відповідальність. Чим більше підприємство, тим більш жорстку поведінку обирають для управління підприємством та адаптивної версії кожної із моделей і на прикладі проаналізувати та прогнозувати доцільність створення нових методів і підсистем. Результати даного дослідження можуть бути використані, як залучення нових управлінських рішень з метою створення більш конкурентної справи, а також збільшення продуктивності працівників та зменшення негативних наслідків, що могло спричинитись неправильним підходом до співробітників, а також те, що залишились ще радянські або застарілі методи покращення роботи.

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**Formulation of the problem**

More and more companies are looking for such specialists. But the main problem is and remains that every issue is viewed through the prism of criticism and uncertainty. Even from the point of view of politics, we can say that whoever is the ruler of our state, the people are always dissatisfied. The consciousness of the majority of Ukrainians is focused on the fact that the President of Ukraine must be an ideal person, without flaws and shortcomings, and always do his job perfectly, even without claiming a high salary. But in modern realities there is no such standard. A real good manager made mistakes and learned from them. But there are those who have already learned this. And such managers, as a rule, already have their own capital and a working business that brings good profits. The consciousness of our people, as mentioned above, is narrowly focused, and they believe that the President of Ukraine must, have left his business for five years, completely absorbed in hard work, receive a little more than the minimum wage. But no one, if asked, would work in such conditions. This is the idea that stereotypes from Soviet times exist even in today's realities.

It's time to move on to the main idea. Management in the economic system. What are the modern personnel management systems? Stages of personnel management.

**Analysis of recent researches and publications**

The works of many domestic scientists are devoted to the study of the problems of the theory and practice of personnel management: O. Herasymenko [6], T. Horodetska [1], O. Hrishnova [2], V. Hryniova [3], M. Dzhaman [4], A. Zelinska [5], A. Kolot [6] and others, but the investigation of modern personnel management practices requires increasing attention.

**Formulation of the goals of the article**

The aim is to study the basic concepts of personnel management, as well as its models, which will be further focused on specific examples of the application of modern development systems. Filling the lack of knowledge on the study of the stages of personnel management.

**Presentation of the main material of the study**

The economy is a system of general processes of exchange, distribution and efficient use of resources (production, distribution and consumption of goods and services). It includes many subsystems. But one of the most important is management. The main subjects of the economy are households, individuals, legal entities and the state. But they will not be able to exist without the right system of planning, setting and performing tasks.

Management as a system is a programmed or arbitrary influence on an individual or a team to achieve a certain goal, through a system of processes specified in the rules of the enterprise, internal collective agreement or job descriptions. This is a rule that shows correctly the management of personnel. This system involves the inclusion of concepts such as strategy, purpose, dependence of other systems on management, competition and risk. The strategy involves long-term goal planning. At the same time, goals belong to short-term planning and are an intermediate stage (with the help of goals the result that was planned by the strategy can be reached). New approaches to process management and organizational methods further emphasize the managerial influence on innovation processes, communications, advertising and information management.

Marketing is another system that is completely dependent on management. Marketing is a system of market relations in which supply and demand are determined and the most correct solutions are sought in order to benefit all parties. Similar to management is that firstly the analysis of the market situation is carried out (in personnel management it is the analysis of the labor market), then the development and forecasting of market strategies (in personnel management it is the definition of personnel policy principles) and finally – the strategy development (in management personnel – the development of a strategic management system). Therefore, we can assume that without management, these and all other systems in the world would not exist.

Management, like all economic systems, takes into account supply and demand in the market. Personnel management balances the demand from the employer who «rents» certain knowledge and skills of the individual who applies for a given vacancy, as well as the supply of the individual / potential employee who is looking for work and offers himself in the labor market to achieve material gain for their own purposes. The state, for its part, proposes every unemployed personto go and register in the employment center as officially unemployed for a certain period, as well as obtain payments within 6 months from the date of application to the employment center. Also, for already potential employees, the Labor Code with all the rules and general responsibilities of employees is regulated.

But the competition that takes place mostly at the recruitment stage depends on several factors. In general, competition is a type of relationship where two or more people apply for the same position (someone may have a higher education, more experience and will be more competitive). Therefore the question arises in the interviews – why should we take you. And then the fortune will direct either to get the dream job, or to gain additional skills or experience at another company. Personnel management is a modern definition of personnel work. Appropriate personnel management allows ensuring the achievement of competitive advantages, work efficiency and maximum return on staff [1].

Therefore, in this situation, the trend of 2021 can be considered relevant, in which, in contrast to 2020 – organizations have already begun to take into account the risks when planning the budget and calculate possible complex scenarios. Also, many companies have created online interviews to save time, and with the help of social networks the entrepreneurs support their brand and post information about their own business. All this shows that people are still ready to follow the progress and the new is not as far as we think.

The motivation for this study is initiated by the need for entrepreneurs to choose the right model of behavior with

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employees to increase their efficiency, as well as to predict possible future risks, according to companies that are more competitive in the labor market. Despite the fact that long-established types of personnel management have been established in the world for a long time, but, as modern experience shows, this is not enough for proper professional and collective development. Therefore, there is a need to study these subsystems to create more competent work.

Personnel management is a purposeful impact on the human component of the organization, which focuses on matching the goals of the organization and the capabilities of employees. Personnel management is based on a generalized idea of the place of man in the organization. One of the elements of management is personnel management, which determines the place of man in the organization. The very concept of «management» is ambiguous. It can be interpreted in terms of personnel management, human resource management or just a person [2; 3].

The relationship between management and governance can be seen in the table below, which shows the improvement of the management system through the management relationship and their development (Table 1).

The personnel management system at a modern enterprise, regardless of the form of ownership, is the most powerful tool for ensuring competitiveness and development. Therefore, there is a necessity to develop and improve the efficiency of the latest personnel management system, taking into account the requirements of a market economy [1; 2, p. 37].

The modern system of personnel management, which is developed at leading domestic enterprises under the influence of the introduction of advanced foreign technologies of personnel management and the use of own experience, includes the following subsystems: analysis and planning of personnel; selection and hiring of staff; staff evaluation; organization of training and advanced training of staff; certification and staff rotation; payroll management; staff motivation; accounting of employees of the enterprise; organization of labor relations at the enterprise; creation of working conditions; social development; personnel security (Table 2) [3, p. 38].

Modern personnel management systems combine many theories. Each model of managerial decision-making conditionally consists of stages:

– emergence of a problem or conflict situation;
– search for variants for management decisions;
– registration of activity in a specific way;
– implementation and control of efficiency [8; 9].

The stages, in turn, are performed using models. Types: totalitarian, democratic, liberal, authoritarian and co-creative.

Table 1 – Transformation of the management paradigm

| № | The traditional management paradigm | The new management paradigm |
|---|---|---|
| 1 | Management of traditional factors of production – land, labor and capital | Management of not only traditional factors, but also knowledge |
| 2 | Preferred operation management | Preferred development management. Innovation management |
| 3 | Management objects – traditional organizations and production processes | New objects of management – global organizations and global processes, intangible assets and intangible processes. Expanding the boundaries of organizations |
| 4 | Separation of management methods in government and commercial organizations, as well as in non-profit organizations | Active borrowing of methods and technologies used in commercial organizations by government and non-profit organizations |

Source: compiled by the authors, based on the sources used [5]

Table 2 – Comparison of personnel management systems

| № | Traditional personnel management system | Modern personnel management system |
|---|---|---|
| 1 | Focus on operational issues | Focus on strategy |
| 2 | Focus on stability | Focus on timely adaptation of the personnel management system to changes in the external environment |
| 3 | Organizational imperative | The human factor |
| 4 | The most important resource is the organizational structure | The most important resource that can be constantly developed is employees |
| 5 | Maximum division of labor, simple and narrow specialties | Optimal grouping of works, multifaceted specialties |
| 6 | External control (managers, staff of controllers, formal procedures) | Self-control and self-discipline |
| 7 | Pyramidal and rigid organizational structure, development of vertical connections | Flat and flexible organizational structure, development of horizontal links that ensure effective interaction between departments and employees |
| 8 | Autocratic leadership style | The leadership style is based on the interest of all employees in the common success of the enterprise as a whole |
| 9 | Competition and the "political game" | Cooperation |
| 10 | Low interest of the employee in his success | High interest of employees in the joint result |
| 11 | Activities only in the interests of the enterprise and its divisions | Activities in the interests of society |
| 12 | Low risk penchant | Focus on innovation and the associated risk penchant |

Source: compiled by the authors, based on the sources used [6, p. 456]

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The table 3 clearly displayed each of them. Many people know about the existence of four of them. But co-creation is like a bonus in the modern world, which reflects the main and best characteristics of each of the models, allowing the company to develop with maximum progress.

Everyone who wants to create his own business desires to choose exactly and correctly what behavior will be right.

Each type of enterprise suitable for different management models, which, as mentioned above – are determined by the private entrepreneur independently.

But modern management has developed another system for personnel management – co-creative. It covers the negative sides and absorbs the positive potential of all types:

– liberal type provides the opportunity for individual self-expression;

– totalitarian type offers the creation of stable and correct ways of governing;

– democratic modelgrants mechanisms for equality for all.

This is probably the best of the proposed methods of personnel management. The conditions for positive self-development and the individual, and the group and the organization as a whole are provided with the help of such an adapted method.

Based on all this, we can make another type. The authoritarian co-creative model stands out as a separate item. It would be suitable, perhaps for large organizations. It provides for the creation of clear criteria for evaluating the activities of each head of the organization (as well as the private entrepreneur who created the organization). It also shows responsibility for the consequences of wrong actions. This can be performed by using the economic indicators. It may be done through a continuous audit, which would be much more appropriate. To do this, the independent auditor can control the organization due to the synthesis of information, analogy, comparative analysis, interviews, testing. Therefore, this system could be used as a standard for public authorities.

A completely authoritarian or totalitarian system hinders progress. Democraticmodel does not take into account the adaptation to modern realities and has nocertainregularity. Liberal structure creates maladaptive and conflicting working conditions.

Personnel management has considered for along time such stages as: planning / forecasting; recruitment and selection; determination of wages; adaptation and career guidance; retraining / training; performance appraisal; dismissal or transfer of employees; training of people who will hold managerial positions.

But at every stage you can find a problem. To begin with, if the company has a problem of insufficient profits or reduced efficiency of employees and the organization as a whole, it is necessary to invite an independent specialist (it is best to take a specialist in consulting). But nowadays more and more people are used for remote work to create the safest working conditions, as well as to create individual responsibility of each employee for their work.

The process of personnel planning or forecasting can be takenfor example – the manager creates a personnel policy,

Table 3 – Models of personnel management

| № | Model name | Characteristic |
|---|---|---|
| 1 | Totalitarian | Based on stability, reliability, collective strength, which is performed by a specific person – a leader. Priorities of group goals over individual ones are set and an accurate management structure is created. The problem situation here is solved with the help of proposals for solutions by the leader, who performs strict control over their implementation. The totalitarian system involves well-established hierarchical management, well-distributed management decisions, a rigid system of control, as well as the manufacturability of the team. Therefore, organizations that have taken such a model as a basis – can hope for a quick solution to problems through the reliable operation of the enterprise and the implementation of goals. But it is a conservative enterprise that cannot flexibly respond to rapid change because of the lack of space for self-development |
| 2 | Liberal | Characterizes the free self-realization of the individual or team of the enterprise.In practice, this is done through the accomplishment of individual interests (struggle, contest, competition).This type of management reveals undisguised conflict by finding the mismatch of individual interests of one or more members of the team. Control and implementation of the established decision depends on the independent responsibility of more interested individuals (there is no real mechanism for assigning responsibility). Therefore, we can say that this system is not yet fully developed and needs to be improved |
| 3 | Democratic | Establishes equal rights and opportunities for every person. Eachmember of the organization has the right to pose each problem, offer its individual solutions. As in state bodies, decisions here are made on the basis of a majority vote.But there are no clear mechanisms for implementing ideas and therefore the disadvantage is a certain spontaneity and anarchy, which brings the model closer to liberal. When choosing votes, for the most part, there may be a division into subgroups in the system of a particular team, which can give the error of these results. So we can say that this system is appropriate only for state executors of our country |
| 4 | Authoritarian | Reflects the principle of hierarchy, but not everyone is able to use it properly.The model involves the organization of processes with a bureaucratic or rigid organizational structure.The basic rule for this type is that one person makes the decision |
| 5 | Co-creative | Problems are forecasted here and all risks (active system) are taken into account, in discussion of which all employees take part.Responsibility is delegated to certain persons for the implementation of the draft decision. Control of implementation is carried out by supporting the implementation of the project.Co-creative type of management provides conditions for continuous development and realization of creative potential of the individual and the team.Such a system in general would be suitable for all organizations, except for very large organizations such as factories |

ISSN Print 2414-0287
ISSN Online 2707-8426

which must take into account the structure and hierarchy of the enterprise. If this is not done and the specialist finds such problem, the following measures may be suggested:

– improving the skills of the person who created the personnel policy and control over it, dismissal from the company if the results are unsuccessful;

– creation of a new system that will take into account the feasibility of recruitment (for example: each manager is given a condition to perform 10 tasks. After that thecontrolmust be how much time it took to execute. Deadlines for managers will also be marked, so it is best way to check expediency of new employees);

– consideration of each department from the point of view of expediency (if necessary – merging with another department or dismissal of persons who work least efficiently);

– creation of a new personnel policy, which will be created correctly – according to the forecast, as well as in keeping with the amendments made at the enterprise.

This raises the question of what businesses lack to create efficient work and make more profits. Large enterprises such as factories are «stuck» in Soviet times and have no space for employee development. For example, trainings have already been introduced by many entrepreneurs, and some do not know what it is yet.Factories in this case offer a tour of the plant for schoolchildren and students, conversations with employees of the plant as a career guidance, as well as internships, but most of which are «came on the first and last day.» Therefore, in this case, it might be appropriate to create collaboration with schools, colleges and universities. One technical person can be invited to tell about work in a certain factory (with an invitation to the factory to show in practice how they do the job), a specialist in acting (who will give some lessons on how to present himself), and a blogger from a certain city (it can be agreed that he will not take money for it – he will have some content about the information that he will tell children and put on his page, which will be his personal advertising). Therefore, it will help both in career guidance and in expanding the plant's ties with other organizations. In colleges the subject «Technologies» that does not fully disclose the profession may also be transformed into collaboration with factories and other enterprises (taking into account courses or training in the specialty and more).

It would be advisable for universities to create real internships that would be noted in students' employment records, as many post-graduate students have no work experience and are less competitive in the labor market. But this can be done only after improving the Laws of Ukraine on Internships.

Also, an interesting fact can be that the certification in thefactories is carried out according to a given scheme. The introduction of a coaching system and SMART system (involving own motivation) gives the possibility to improve this system. Typically, the following concepts are used by modern small companies (e. g., IT):

S – specific, M – measurable, A – attainable, R – relevant, T – time-bound.

It can be explained as follows: for example, in the plant the efficiency of a particular employee has reduced (the number of manufactured parts has decreased significantly). Then the manager should call this employee and have a conversation with him. In a coaching system, this is created so that the employee sees the chain of the problem. The employee makes fewer parts – the team must work harder to cover costs – if the norm is not met – deficit – if less parts made by the department – less finished products. As a result there is a reduction in the profits of the organization. This affects the work of the whole enterprise, so it is possible to reduce wages or even dismissal. After that, the manager can ask what problems the employee has, what has changed his efficiency. Then ask the question, what is the motivation of the employee, in addition to wages, to work at the company. After that, a certain work limit is set – for example, to improve the results by 10% by the end of next week. Also, for greater effectiveness – conducting ABC testing. If an employee has a period of stagnation – or send him to training courses, or create a recreation room.

No less interesting is the proposal to improve the working conditions not only of factories, but also of many enterprises in general.

International trends in personnel management in 2021 have shown very interesting results. An experiment was conducted, with the participation of workers and management, to consider possible variants for the development of relations among them in the future. As a result, 4 possible development scenarios were identified:

– work as fashion (the labor market is seen as a fashion industry – employers will have to change constantly, according to changes in employees'mood, tactics of competitors and market indicators);

– battle of talents (workers will compete with each other for jobs, the number of which will be limited due to excess demand);

– work is work (both parties will consider the social responsibility of business and self-realization of the worker (personal and social), as two unrelated aspects);

– the main thing is the goal (the relationship between employees and employers will be built around common goals).

The experience of 2020 shows no less interesting trends in the readiness of organizations to implement development (see Fig. 1).

And the indicators of 2021 show the forecast of staff shortages until 2030 (see Fig. 2).

In order to increase the efficiency of the personnel management system, it is necessary to analyze and take into account the specific conditions of market economy development in Ukraine. The great importance for each company, regardless of organizational and legal form, is the development of assessment methods that can determine the actual situation in the company in the field of personnel management, identify weaknesses and provide recommendations for efficiency.

Personnel management service implements personnel policy and coordinates the activities of human resources management of the enterprise; it is needed to expand the functions to construct new systems of employment incentives, career management, conflict prevention, study

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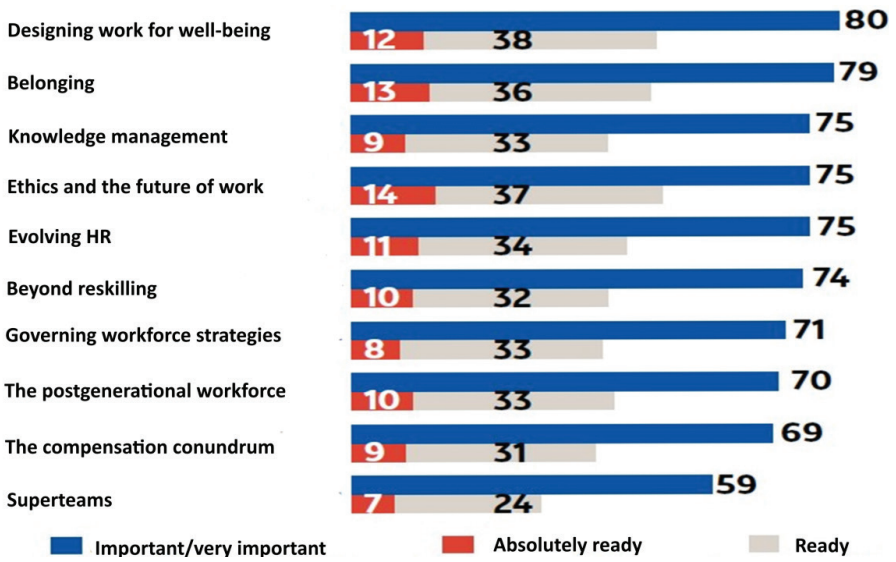


Fig. 1 – Trends in 2020 on the readiness to implement mechanisms for the development of personnel management
Source: [10]


Fig. 2 – Staff shortage forecast until 2030, mln of people
Source: The Organization for Economic Co–operation and Development (OECD), World Economic Forum, Roland Berger estimates

of the labor market, the creation of personnel reserves for management staff [7].

In modern conditions, the process of developing and updating the concept of personnel management is underway, while improving both personnel management systems and the method and tools used. The employee with his personal and professional characteristics from the object of management has become an object of study in order to develop and apply such technologies that will create the best conditions for realizing the potential of employees and meet their expectations and needs [4].

## Conclusions

An effective personnel management system (PMS) is not only the most important factor in the economic success of a modern enterprise, a tool for improving the efficiency and productivity of personnel, but also socially oriented management aimed at each individual employee with the purpose of increasing his work motivation and satisfying needs through a system of material incentives. The above problems, as well as their solutions are risky. The proposed examples of development can be applied to different models.The actions mentioned in the last question can make the staff turnover lower. If from the beginning you identify correctly the management model that will exist ideallyin the company – there will be no possibility of risk of creating other problems accordingly. Even if such trifles as talented managers and leaders are sent abroad once a year for several months (work to improve the skills of the employee, as well as the employee's own income), but stating in the contract that the employee will return to the company after completing it. This will help to reduce staff turnover, migration, create employee confidence in the employer, and expand international ties with foreign organizations. This shows that this and all other issues involve not only business but also legislative changes.

Summing up all this, we can conclude that qualified and proper personnel management will exist perfectly when the state works in tandem with organizations and private employees. In addition, considering the data of 2020, it can be noted that although most workersare focused on individual results, instead of team's ones, and the indicators of the forecast of the shortage of personnel from 2021 to 2030 show that even the most developed countries of our world will have insufficient work force, which can greatly shake the economy of each country, so, on the example of such countries as China, the United States, Western Europe countries, it is necessary to take certain measures to improve both personnel management and the economy as a whole. Ukraine should anticipate negative risks of impact on the country and, analyzing the experience of foreign countries, take precautionary measures. In order to avoid serious consequences it should create the most correct management of all branchesof government in the state.

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# ECONOMIC AND MATHEMATICAL MODELING AND INFORMATION TECHNOLOGIES IN ECONOMICS

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## THE EVALUATION OF A POTENTIAL INVESTOR IN THE ENTERPRISE MANAGEMENT PROCESS

**Ivanov M.M.**
*Zaporizhzhia National University*
*Ukraine,69600, Zaporizhzhia, Zhykovsky str., 66*
nn_iva@ukr.net
ORCID: 0000-0002-1908-0763

**Key words:**
enterprise management, investment project, investment project sensitivity, economic risk assessment

The article considers the assessment of a potential investor in the process of enterprise management. This article discusses the evaluation of the effectiveness and sensitivity of the investment project. The assessment presented in the article enables the enterprise to adapt to the existing economic conditions. Also, this article proposes an assessment of economic risk, which takes into account the dynamics of prices for the following cost components: material costs, wages with social security contributions and other material costs, which in turn are divided into different types of resources.

## ОЦІНКА ПОТЕНЦІЙНОГО ІНВЕСТОРА В ПРОЦЕСІ УПРАВЛІННЯ ПІДПРИЄМСТВОМ

**Іванов М.М.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
управління підприємством, інвестиційний проект, чутливість інвестиційного проекту, оцінка економічного ризику

У статті розглядається оцінка потенційного інвестора у процесі управління підприємством. У цій статті розглядаються оцінки ефективності та чутливості інвестиційного проекту. Подана у статті оцінка дає можливість підприємству адаптуватися до існуючих економічних умов. Також у цій статті пропонується оцінки економічного ризику, яка враховує динаміку цін за такими складовими витрат: матеріальні витрати, заробітна плата з відрахуваннями на соціальне страхування та інші матеріальні витрати, які у свою чергу поділяються на різні види ресурсів.

### Statement of the problem

The success of the management of modern enterprises is determined today by the assessment of potential investors. This assessment takes into account the effectiveness and sensitivity of the investment project. Which determines the relevance of this paper.

### Analysis of other researches and publications

Analysis of scientific works of domestic and foreign scientists on the investment attractiveness of enterprises Grebenyuk N.O. [1], Bril K.G. [2], Katan L.I. [3], Butinko V.V. [4], Yepifanov A.O. [5], Butov A.M. [6] confirmed the relevance of this article.

A significant contribution to solving the issues of investment management and investment attractiveness of the enterprise was reflected in the works of I.A. Blank [8], L.I. Katana [3], A.O. Epifanova [5], I.M. Boyarko [7], Boyarko I.M. [7] and others. The analysis of these works confirmed the actual problem.

This problem is of great importance both for the economy and for enterprises. Evaluation of a potential investor in the enterprise management process makes this task relevant.

### Objectives of the article

The purpose of this paper is to present a methodology for assessing potential investors, which takes into account the effectiveness and sensitivity of the investment project.

### The main material of the research

Sources of investments of an industrial enterprise today are loans from external investors. These enterprises cannot count on attracting a mass investor, that is, on a wide issue of shares. Since all funds received from the sale of shares of the first issue will go to the state budget, and only funds from the second issue will go to the enterprise in the form of its own investments.

The risk of investment in production at the present stage in Ukraine is so great that their volume has dropped

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to a critical level. At the same time, the development of production is the only sure way to get the country out of the protracted crisis.

The impact of sharp rises in inflation, uncertainty in the legislative sphere, the crisis of non-payments and similar circumstances bring to the fore the problem of evaluating an investment project and impose a specific shade on it, which is characteristic only for the situation that has developed in Ukraine. To determine which capital investments in our country are currently able to make a profit, and not ruin an investor, Western methods for evaluating investments are not able to, since they are not designed for such a complex and uncertain economic situation. The conclusion of Western investors is unequivocal – the rejection of almost all investments. A Ukrainian entrepreneur is simply forced to work in such difficult conditions and find ways to invest capital that can bring him profit.

The most correct, but also more time-consuming in the calculations, is a technique that provides for the adjustment of all factors affecting cash flows. Key factors include revenue and variable costs. The adjustment can be carried out using various indices, since the price indices for the products of an industrial enterprise and the raw materials it consumes may differ significantly from the inflation index. With the help of such recalculations, new cash flows are calculated.

The real interest rate is determined through the nominal interest rate $r_{nom}$:

$$r_{real} = \frac{\left(1 + r_{nom}\right)}{1 + h} - 1, \quad (1)$$

where $h$ – is the amount of inflation.

The real interest rate including income tax is calculated using the nominal interest rate $r_{nom}$ and the inflation rate $h$:

$$r_{real} = \frac{\left(1 + \left(1 - \tau_p\right) r_{nom}\right)}{1 + h} - 1. \quad (2)$$

Formulas (1) and (2) are explained as follows. Due to inflation, prices rise by ($1+h$) times, so there is a multiplier. The payment of income tax is equivalent to a decrease in the nominal interest rate by (1-) times. This gives rise to the factor (1-).

In general:
before tax:

$$\left(1 - r_{nom}\right) = (1 + r_{real})\left(1 + h\right); \quad (3)$$

after tax:

$$\left(1 + \left(1 - \tau_p\right) r_{nom}\right) = (1 + r_{real})\left(1 + h\right). \quad (4)$$

In the absence of inflation, the net present value of the project can be written as:

$$NPV_N = \sum_{t=1}^{n} (1 - \tau_p) \frac{CF_t \left(1 + h\right)^t}{\left(1 + r_N\right)^t} + \sum_{t=1}^{n} \tau_p \frac{D_t}{\left(1 + r_N\right)^t}_{real} - I_0), \quad (5)$$

where $r_N$ – the nominal interest rate of discounting; $CF_t$ – the estimated financial flow in period t, expressed in real terms.

In formula (3), the factor $\left(1 + h\right)^t$ is only in the first term. This is due to the fact that initial investments $I_0$, $D_t$ are depreciated as without inflation adjustment.

Net present value in real terms:

$$NPV_R = \sum_{t=1}^{n} (1 - \tau_p) \frac{CF_t}{\left(1 + r_R\right)^{'}} + \sum_{t=1}^{n} \tau_p \frac{D_t}{\left(1 + r_R\right)^{'} \left(1 + h\right)^{'}} - I_0). \quad (6)$$

Inflation adversely affects the opportunity to invest, reducing the real value from $\sum_{t=1}^{n} \tau_p \frac{D_t}{\left(1 + r_R\right)^{'}}$ to $\sum_{t=1}^{n} \tau_p \frac{D_t}{\left(1 + r_R\right)^{'} \left(1 + h\right)^{'}}$.

$$NPV_N = NPV_R. \quad (7)$$

In the presence of inflation $NPV\left(h\right) < NPV\left(0\right)$.

Thus, in conditions of zero inflation, capital-intensive projects are most profitable. As inflation rises, the least capital-intensive projects become the most profitable.

With inflation, all indicators of formula (6), except for the amount of depreciation, are multiplied by $\left(1 + h\right)$, where $h$ is the inflation rate. So, if the company produces products, then the selling price of products increases in proportion to the level of inflation. At the same time, depreciation is calculated without adjusting for inflation, which results in a reduction in the tax shield. As a result, inflation makes capital-intensive projects unprofitable.

An increase in the rate of inflation requires:
– displacement of cash flows to the beginning;
– reducing the duration of projects.

A decrease in inflation leads to an increase in the profitability of projects:
– long-term;
– capital-intensive.

High inflation hinders investment, so financial stabilization is a necessary condition for the recovery of the economy.

Risk assessment methods based on probabilistic characteristics and measuring the risk of an investment project using the standard deviation of the net present value of the project from its expected value – $\delta\left(\text{NPV}\right)$ have the greatest potential for adaptation to existing conditions – is determined by different approaches.

The simplest approach is to develop three options for the development of an investment project – optimistic, pessimistic and most probable. For each option, a profitability indicator is calculated – the net present value of the project (NPV) and the probability of implementing these options is assigned. Based on this information for the project, the expected value of NPV, weighted by the assigned probabilities, and the standard deviation from it, are calculated. The larger the standard deviation of NPV, the greater the risk of the project. It must be said that the only positive side of this approach is its simplicity, however, the degree of accuracy of risk assessments leaves much to be desired. After all, the optimistic option for the development of the project assumes the maximum possible income minus the minimum costs (moreover, the minimum for each cost item), that is, this option, the probability of which is practically equal to zero. The same can be said about the pessimistic option – minimum income minus maximum costs. It is very difficult to make realistic scenarios of the optimistic and pessimistic development of the project, and even more difficult to set the probabilities of their implementation.

More complex tools for assessing the risk of projects are simulation and analytical models that allow you to consider all possible development options.

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We consider the following as the simplest way out of such a difficult situation: it is not necessary to consider the volume of production as a random variable, but several alternatives of the same project should be evaluated at different production volumes. In this way, you can adjust the price and costs in connection with the changed volumes of production.

In addition, the known models do not allow taking into account the impact of inflation on relative shifts in prices for products sold and on production costs. In order to take into account as many factors as possible influencing the results of choosing a potential investor and project when assessing risk, it is advisable to use two approaches at once: identifying a potential investor; analytical modeling and analysis of the degree of economic risk of the project, to which investment activity is most exposed.

To determine a potential investor in the management of an enterprise, a decision is provided that takes into account the likelihood that the investor will be unjustified both from an economic and technical point of view, will be minimal. In this case, the choice of the investor is the possibility of determining due to the maximum value of the assessment S – the expected value of the ratio of forecast economic indicators to indicators of the financial condition of an industrial enterprise, taking into account the overall risk:

$$S = max\left\{ S_i = \frac{\prod_{j=1}^{k} Y_{j,pr}}{\prod_{j=1}^{k} X_j} P_e P_t \right\},\ i = \overline{1,n}, \qquad (8)$$

where $Y_{j,pr}$ – predicted values of the j-th economic indicators (liquidity, solvency, profitability, and others); $X_j$ – indicators of the financial condition of an industrial enterprise; $P_e$ – probability of economic success; $P_t$ – probability of technical success.

When solving the problem of assessing economic risk, it is necessary to separately take into account the price dynamics for the following cost elements: material costs, wages with social insurance contributions and other material costs, which, in turn, are divided into different types of resources. The more heterogeneous the structure of material costs, the more meaningful their splitting is for the study of relative price changes. And vice versa, the more homogeneous the structure of material costs from the point of view of price changes, the more meaningful it is to consolidate them (combine them into homogeneous groups) to reduce the complexity of calculations.

A measure of the risk of profit deviation from the expected value is its standard deviation. The risk of profit deviation from the expected value may be primarily due to changes in prices for finished products, raw materials, materials, fuel, energy, etc. under the influence of various factors. In addition, profits may deviate from those expected as a result of an inadequate assessment of the cost-benefit ratio in basic prices, for example, due to the lack of necessary information or the use of aggregate methods of calculation.

Based on the model of profit formation in settlement prices, a formula was obtained for determining the standard deviation of profit. Taking into account the interdependence of relative price changes, this formula has the following form:

$$\begin{aligned}\sigma^2(Pr) = {} & D(S_0)\times D(I_0) + M^2(S_0)\times D(I_S) + \\ & + D(S_0)\times D(I_S) + M^2(S_0)\times D(I_C) + \\ & + M^2(S_C) D(S_0)\times 2M(S_0)\times M(C_0)\times \\ & \times \sigma(I_S)\times\sigma(I_C)\times\rho_{I_S I_C},\end{aligned} \qquad (9)$$

where $\sigma^2(Pr)$ – is the variance of balance sheet profit; $D(S_0), D(S_0)$ – respectively, dispersion and mathematical expectation of proceeds from sales in basic prices; $D(S_0), D(C_0),$ – dispersion and mathematical expectation for production and sale in basic prices; $D(I_S), M(I_S), \sigma(I_S)$ – dispersion, mathematical expectation and standard deviation of the price index for products sold, cleared of the effect of inflation; $D(I_C), M(I_C), \sigma(I_C)$ – variance, mathematical expectation and standard deviation of the index of change in costs, cleared of the effect of inflation; $\rho_{I_S I_C}$ – coefficient of correlation between the dynamics of costs and prices for products sold.

Despite the fact that risk is understood as the probability of unforeseen losses, when assessing the degree of investment risk, only those factors leading to a loss that the investor can foresee (predict) can be taken into account.

Therefore, in formula (9), the expectation of price indices should be considered their predicted values, and the measure of the risk of deviation of the price index from its expected value is the standard error of the forecast. In other words, the inability to predict the future value of price indices in narrower intervals can be interpreted as a greater risk. Information on the degree of accuracy of costs in basic prices must also be presented as standard deviations of these values from their expected values.

The projection of benchmark price indices should be carried out at a fixed rate of headline inflation at the expected level, and the uncertainty of the inflation rate itself should be taken into account using sensitivity analysis.

If necessary, projects should be checked for sensitivity to changes in the following investment conditions: loan interest rate, investment costs, income tax rate, if such changes in tax legislation are likely, since in formula (9) these values were considered as deterministic, not random.

Knowing $\sigma(Pr_t)$, $\sigma(SF_t)$ we define:

$$\sigma(SF_t) = (1-T)*\sigma(Pr_1), \qquad (10)$$

where $\sigma(SF_t)$ – the standard deviation of the cash flow of the period; $T$ – is the income tax rate (in fractions of a unit).

By calculating $\sigma(SF_t)$ for each year of the project implementation, it is possible to determine $\sigma^2(\text{NPV})$:

$$\sigma^2(\text{NPV}) = \sum_{t=0}^{T} \frac{\sigma^2(SF_t)}{(1+d)^{2t}} + \sum_{t=0}^{T} 2\rho_{t,t-1} * \frac{\sigma(SF_t)*\sigma(SF_{t-1})}{(1+d)^{2t-1}}, \qquad (11)$$

where $\sigma^2(\text{NPV})$ – is the variance of the net present value; $d$ – is the discount factor; $\rho_{t,t-1}$ – coefficient of correlation between cash flows of nearby periods.

Formula (11) takes into account the relationship between the cash flows of nearby periods. The covariance dependence between cash flows separated from each

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other for significant periods is extremely small, but for nearby periods it is present and, as a rule, positive, that is, $0 < \rho_{t,t-1} < 1$. If we assume that the cash flows of different years are independent, then the formula simplifies and takes the form:

$$\sigma^2(\mathrm{NPV}) = \sum_{t=0}^{T} \frac{\sigma^2(SF_t)}{(1+d)^{2t}}. \quad (12)$$

Regarding the relationship between cash flows, I would like to note the following. The value of this dependence is influenced by both controllable and uncontrollable factors. You can manage the situation, for example, in such cases: if the selling price of finished products at the time of entering the market turned out to be lower than the expected value, then due to more effective advertising in the subsequent period, it can be increased; if the main supplier increased the price of raw materials and the costs were higher than expected in one period, then another, cheaper source of raw materials will probably be found in the next period.

Therefore, it is impossible to determine exactly $\rho_{t,t-1}$ it is only possible to establish its boundary values by expert means. For example, if the degree of influence of controlled factors is significant $\rho_{t,t-1}$, then it can be set in the range from 0 to 0.5. The minimum and maximum value (NPV) can then be calculated.

Thus, it is considered how it is possible to determine the main indicator of the degree of risk of an investment project (NPV). However, information about the degree of risk of the project, presented in the form of a standard deviation of the net present value, will not be sufficient for practical investors. But the probability of losses of specific amounts, determined using this indicator, is extremely necessary information for making a decision. The investor's actions will be more justified if he knows the probability of losing the expected profit from the project in which he is going to invest his capital, the probability of losing this capital, and also has an idea of how possible losses will affect his property condition.

The practical implementation of this technique was carried out by us not completely due to the lack of statistical data on cash flows in the middle of the annual period. Therefore, one cannot be guided by the data obtained without a share of error. To obtain a more probable assessment of an investment project, it is necessary to accumulate statistical data on the project throughout its operation and make appropriate adjustments to the data obtained.

The data obtained as a result of the evaluation of the investment project are given in Table 1.

The results of the investment project evaluation were obtained for each year of its operation:

$$Pr1 \rightarrow 246567665$$

$$Pr2 \rightarrow 929028410$$

$$Pr3 \rightarrow 1462159633$$

$$Pr4 \rightarrow 1851848149$$

$$Pr5 \rightarrow 2324769972$$

$$\sigma^2(Pr) = 1{,}17528\mathrm{E}{+16},$$

$$\sigma(CF) = 75887242{,}24,$$

$$\sigma^2(NPV) = 459094\mathrm{E}{+10}.$$

The value $K_{NPV} = \frac{\Delta \mathrm{NPV}}{NPV}$ is defined as the sensitivity coefficient of the investment project according to the criterion of net present value. It shows to what extent the deviations of the selected parameters affect the change in NPV, which allows you to choose one or more investment projects from a variety of alternatives.

Sensitivity coefficients:

$$\frac{\Delta \mathrm{NPV}}{\Delta X_n} = 15623.53; \quad \frac{\Delta \mathrm{NPV}}{\Delta C} = 1000884221.$$

## Conclusions

The article proposes a method for assessing a potential investor in the process of enterprise management and an investment project in enterprise management, which makes it possible to determine an investment project taking into account the degree of risk.

Determining the degree of project risk is one of the stages along with the assessment of economic efficiency, since both of these factors are equally significant, especially in a market economy.

Table 1 – Initial data for the evaluation of the investment project

| Investment period | The amount of costs | The sales proceeds | The cost change indices | The price indices | The profit amount |
|---|---|---|---|---|---|
| 1 year | 594 955 000 | 676 503 000 | 1,24 | 1,455 | 246 567 665 |
| 2 years | 789 985 924 | 1 251 092 933 | 1,327 | 1,581 | 929 028 410 |
| 3 years | 804 789 193 | 1 705 552 682 | 1,018 | 1,338 | 1 462 159 633 |
| 4 years | 821 668 633 | 2 169 959 877 | 1,020 | 1,24 | 1 851 848 149 |
| 5 years | 833 281 688 | 2 641 524 040 | 1,014 | 1,20 | 2 324 769 972 |

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# ANALYSIS AND FORECASTING OF THE DYNAMICS OF PRODUCTION VOLUME BY THE HIGH-TECH SECTOR ENTERPRISES OF THE UKRAINIAN INDUSTRY

**Los V.O., Makarenko O.I., Stukalo K.S.**
*Zaporizhzhia National University*
*Ukraine,69600, Zaporizhzhia, Zhykovsky str., 66*
vitalos.2704@gmail.com, olenamak@gmail.com, stukalo.katya26@gmail.com
ORCID: 0000-0002-7932-5232, 0000-0003-1009-5122, 0000-0003-2231-6295

**Key words:**
autoregressive model, high-technology sector, dynamics, forecast, structure

The article is devoted to the study of the dynamics of production volume by enterprises of the high-tech sector of Ukrainian industry: chemicals and chemical products; basic pharmaceutical products and preparations; computers, electronic and optical products; air and spacecraft and related machinery; medical and dental instruments and supplies, electric equipment. Theoretical and practical aspects of the development of high-tech sector of the economy are considered, the essence of this concept is analyzed. The structure of the high-tech sector of Ukrainian industry was analyzed and it was found that for the period from 2012 to 2019, the development of the studied industries has a positive trend: the highest growth rates are observed in the manufacture of medical and dental instruments and supplies (an increase by 2.2 times), and the lowest – in air and spacecraft, related machinery (growth of 3%). The analysis of the dynamics and structure of the development of high-tech sectors in Ukraine was carried out. A number of autoregressive models were built, their accuracy and quality were evaluated. The models were tested for autocorrelation of residuals by the Durbin-Watson and the von Neumann criteria. According to the results of the calculations, it was found that there is no autocorrelation in the models. On the basis of the models built, a forecast of the development of the high-tech sector of industry in Ukraine was made. The results of the forecasting indicate the preservation of existing trends in the sectors under study.

# АНАЛІЗ ТА ПРОГНОЗУВАННЯ ДИНАМІКИ ОБСЯГІВ ВИРОБНИЦТВА ПІДПРИЄМСТВАМИ ВИСОКОТЕХНОЛОГІЧНОГО СЕКТОРУ ПРОМИСЛОВОСТІ УКРАЇНИ

**Лось В.О., Макаренко О.І., Стукало К.С.**
*Запорізький національний університет*
*Україна, 69600, м. Запоріжжя, вул. Жуковського, 66*

**Ключові слова:**
авторегресійна модель, високотехнологічний сектор, динаміка, прогноз, структура

Стаття присвячена дослідженню динаміки обсягів виробництва підприємствами високотехнологічного сектору промисловості України, з виробництва: хімічних речовин і хімічної продукції; основних фармацевтичних продуктів і препаратів; комп'ютерів, електронної та оптичної продукції; повітряних і космічних літальних апаратів, супутнього устаткування; медичних і стоматологічних інструментів та матеріалів, електричного устаткування. Розглянуто теоретичні та практичні аспекти розвитку високотехнологічного сектору економіки, проаналізовано сутність даного поняття. Проаналізовано структуру високотехнологічного сектору промисловості України та встановлено, що за період з 2012 р. по 2019 р. розвиток досліджуваних галузей має позитивну тенденцію: найбільші темпи зростання спостерігаються у галузі виробництва медичних і стоматологічних інструментів та матеріалів (збільшення у 2,2 рази), а найменші – у галузі виробництва повітряних і космічних літальних апаратів, супутнього устаткування (зростання на 3%). Проведено аналіз динаміки та структури розвитку високотехнологічних галузей промисловості України. Побудовано ряд авторегресійних моделей, оцінено їх точність та якість. Моделі перевірено на автокорельованість залишків за двома критеріями: Дарбіна-Уотсона та Неймана. За отриманими результатами розрахунків встановлено,

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що автокореляція в моделях відсутня. На основі побудованих моделей розроблено прогноз розвитку високотехнологічного сектору промисловості України. Результати прогнозування свідчать про збереження існуючих тенденцій у досліджуваних галузях.

**Statement of the problem**

The structure of a country's economic system determines the efficiency, dynamics and pace of its economic development. Ukraine's modern economy is characterized by the structural shifts: the share of productive industry decreased, and the non-productive increased [1]. According to the State Statistics Service of Ukraine [2] the industry share (mining, processing industry, electricity, gas, water, construction) in 2001 amounted to 33,7% of the country's GDP, services sector – 50,6%, agriculture – 15,7%. In 2020 the industry's share in the GDP structure amounted to 24,21%, services – 64,95%, agriculture – 10,84%. In addition, the structure of industry is changing towards a growing share of the high-tech sector, consisting of high-tech material manufacture and provision of high-tech services. The main high-tech sectors of the industry include: the manufacture of pharmaceutical products, biotechnology; manufacture of air and spacecraft equipment; manufacture of media equipment: for radio, television and communications; manufacture of medical equipment, measuring instruments, optical devices and equipment; production of office equipment and computer technology, software; management, development and use of Internet resources [3]. These industries influence the economic and social development of the country, contribute to the activation of a range of related industries that supply them with materials, components and technological equipment, research and development activities. So, one job in the high-tech industry creates 7–8 jobs in adjacent industries, and with the trade, service and recycling sectors, it creates up to 10 jobs. However, in Ukraine high-tech industries form only 6% of GDP and 5% of exports, and the science intensity of GDP is only 0.77% [4]. This indicates the ineffective functioning of high-tech sectors of the Ukrainian economy. The National Economic Strategy for the period up to 2030 [5] includes the promotion of innovation and modernization of sectors of the economy to improve their competitiveness, so the analysis and forecasting of the development of high-tech sector of Ukraine is an important scientific and practical task, the solution of which will make it possible to determine the status of achieving this goal.

**Analysis of recent studies and publications**

The study of issues of structural adjustment of the national economy is reflected in the works of: V.M. Heyets, I.V. Kryuchkova, E.M. Libanova, L.N. Serhieieva and others.

The works of both domestic and foreign scientists are devoted to the study of the high-tech sector: O.B. Bilotserkivsky [6], I.I. Ivanova [7], E.V. Prushkivska [8], O.B. Salikhova [9], L.I. Fedulova [10] and others.

In particular, O.B. Bilotserkivsky, based on the analysis of the structure of the high-tech sector of Ukraine and the structure of the volume of industrial products realized by type of activity, determined that Ukraine is approaching to the developing countries by the branch structure of industry [6].

Ivanova I.I. studied trends in the development of the high-tech sector of the economy [7]. Her work examines the modern transformation processes of the economy and their characteristic features, analyzes and presents the world volume of production of high-tech products. Ivanova I.I. determined that the USA is a leader in the world production of high-tech products. The author analyzed the specific weight of countries in the world production of high-tech products, as well as world exports of high-tech products. Ivanova I.I. believes that the general trend in the formation of the economic model in developed countries is its innovative orientation on the basis of intensive creation and use of knowledge of society, which is possible due to the appropriate scientific and technical policy, development of education system, information support.

Prushkivska E.V. scientific research analyzes the approaches to defining the concept of «high-tech industry of the economy»: industry, commodity, definition of a high-tech enterprise. It is proved that the industry approach is appropriate to use for macroeconomic analysis and international comparisons; the commodity approach – for the analysis of foreign economic activity, and to develop a system to support and stimulate the development of high-tech sector it is appropriate to use the approach based on the definition of high-tech enterprise [8].

The studies of methodological approaches to the assessment of the high-tech sector of the economy in Ukraine are devoted to the works of O.B. Salikhova [9]. Based on the analysis of the methodology of defining high-tech industries and goods, the author proposed adapting the classification for high-tech goods of the Organization for Economic Cooperation and Development (OECD) to the Ukrainian reality. Considering this, she conducted a comparative analysis of the development of the high-tech sector of Ukraine with other countries of the world.

Problems of economic development of Ukraine in the context of the analysis of markets for high-tech goods and services are studied in the works of L.I. Fedulova [10]. In her research, the author identified the characteristic trends and problems of development of the high-tech sector of the Ukrainian economy and examined the structure of exports and imports of high-tech services. In her work: the factors that determine the place of Ukraine in the world market of high-tech goods and services are analyzed; the forecasted directions of development of the market of Ukrainian high-tech goods are developed and the measures on their implementation are offered; the investment climate of the country and its characteristics are considered. According to L.I. Fudulova, the state of the market of high-tech goods in Ukraine is characterized by general instability of legislation, underdeveloped financial intermediation institutions, macroeconomic imbalances, high riskiness of economic activity, insufficient protection of investors' rights. The

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author noted that «the high-tech sector is a complex systemic scientific and production structure, which occupies a certain place in the economy and resource provision is much more important and meaningful than it is interpreted in the literature and in the normative legal acts of Ukraine» [10].

However, despite the significant amount of scientific research analyzing structural changes in the economy, the issue of assessing trends in the development of high-tech sector of Ukraine on the basis of economic and mathematical modeling apparatus is not covered enough in the scientific literature, which makes the chosen topic of the study relevant.

## Objectives of the article

The objective of the article is to analyze the structure of the high-tech sector of the Ukrainian economy and forecasting of development indicators based on autoregressive models.

## The main material of the research

To analyze the dynamics and structure of the high-tech sector of the industrial sector of Ukraine the following types of industrial activity according to the OECD classification are taken into account [11]: Manufacture of chemicals and chemical products; manufacture of basic pharmaceutical products and pharmaceutical preparations; manufacture of computer, electronic and optical products; manufacture of air and spacecraft and related machinery; manufacture of medical and dental instruments and supplies, manufacture of electrical equipment. For these types of economic activity the analysis of structural components of high-tech industries in the industry of Ukraine based on the data of the State Statistics Service of Ukraine concerning the volume of products (goods, services) produced by enterprises by type of economic activity in 2012–2019 was carried out (Table 1) [12].

The analysis of the data in Table 1 showed that the ratios between the components of high-tech production change over time. In 2013 and 2014, there was a significant decrease in chemical production and chemical products by 9.4% and 8%, respectively. In general, this time series is characterized by significant volatility, namely in 2015 there was a sharp increase (by 33.8%), and in 2016 a decrease by 21% and since 2017 there has been a steady growing dynamics. The volume of chemical production grew by an average of 2.6% annually. From 2012 to 2019, the output of chemicals and chemical products grew by 22.6%. The dynamics of the production volumes of basic pharmaceutical products and preparations is characterized by a steady growing dynamics. On average, each year the volume of production of basic pharmaceutical products grew by 16.5%. In 2019, production of pharmaceutical products increased by 7.4% relative to 2018 and by 3.4 times relative to 2012. The existing trend can be explained by preferential taxation of enterprises producing basic pharmaceutical products [13]. The time series characterizing the volume of production of computers, electronic and optical products also has a growing trend. It should be noted that from 2012 to 2015 the production volumes of the analyzed time series remained almost unchanged, and in 2016 there was a significant growth (almost by 50%). In general, during the analyzed period the volume of manufacture of computers, electronic and optical products grew on average by 9,9% annually.But in 2019 the volumes reached the value – 19134794.4 thousand UAH, which is 2 times more than in 2012. The volume of manufacture of computers, electronic and optical products grew on average by 9,9% annually. But in 2019 the volumes reached the value – 19134794.4 thousand UAH, which is 2 times more than in 2012. The volume of manufacture of aircraft and spacecraft, related machinery gradually grew by 2017, on average by 5.1% each year. And in 2018 and 2019 there is a decrease in manufacturing volumes by 17.8% and 7.2%, respectively. Overall, there was a 3% increase in the manufacture of aircraft and spacecraft and related machinery over the study period. The manufacture of medical and dental instruments and materials is characterized by a steady growing dynamics. Thus, in 2019 compared to 2018, the growth was 13.7%, and compared to 2012, the volume of production increased by 2.8 times. On average, the annual growth of medical and dental instruments production volumes was 13.5%. The dynamic series characterizing the production volumes of electrical equipment by 2014 tends to decrease. And from 2015 to 2018 there is a growing dynamics, but already in 2019 there was a significant decrease in production volumes – by 5.7%. Analysis of the dynamics of the series for the period from 2012 to 2019 shows an increase in the volume of production of electrical equipment by 68.3%. Having

Table 1 – The volume of industrial products manufactured by enterprises of the high-tech sector in Ukraine, 2012–2019, mln. UAH

| Years | Manufacture of chemicals and chemical products | Manufacture of basic pharmaceutical products and pharmaceutical preparations | Manufacture manufacture of computer, electronic and optical products | Manufacture of air and spacecraft and related machinery | Manufacture of medical and dental instruments and supplies | Manufacture of electrical equipment |
|---|---|---|---|---|---|---|
| 2012 | 68386,87 | 11422,78 | 9022,349 | 20016,13 | 878,0318 | 25874,53 |
| 2013 | 61970,24 | 13133,94 | 9856,357 | 19870,36 | 884,9882 | 24859,77 |
| 2014 | 57075,44 | 15879,72 | 9695,138 | 19909,91 | 1043,554 | 22643,47 |
| 2015 | 76379,55 | 21711,37 | 9597,708 | 24461,08 | 1594,237 | 26006,38 |
| 2016 | 60265,58 | 26963,63 | 14373,23 | 24547,42 | 1772,576 | 30379,14 |
| 2017 | 63467,38 | 31230,08 | 15097,22 | 27035,42 | 2022,68 | 37321,09 |
| 2018 | 77883,41 | 36060,76 | 19183,38 | 22233,57 | 2129,757 | 46160,79 |
| 2019 | 83846,96 | 38746,96 | 19134,79 | 20623,79 | 2420,664 | 43536,39 |

Source: built by the authors using [12]

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analyzed the dynamics of indicators of production volumes of high-tech industries, we can assert that the studied time series have an increasing trend. So, high-tech industries in Ukraine are developing, although not at a significant pace.

In order to establish the degree of contribution of each component to the development of the high-tech sector of the domestic economy, let us analyze its structure in dynamics (Fig. 1).

The maximum share in the structure of the high-tech sector is occupied by the production of chemicals and chemical products, but this share decreased by 10.2% in 2019 compared to 2012. There is also a decrease in the share of manufacturing of aircraft and spacecraft and related equipment (from 14.8% to 9.9%). The share of manufacturing of basic pharmaceutical products and preparations increased from 8.4% in 2012 to 18.6% in 2019, the manufacture of computers, electronic and optical products from 6.7% to 9.2%. The share of manufacture of medical and dental instruments remains practically constant. In general, the share of the high-tech industry sector during the analyzed period decreases from 10.2% to 7.2%. This tendency is connected with presence of various obstacles and threats, the main threat is unstable political and economic situation in the country, connected first of all with the armed conflict in the Donbass. Another important problem is insufficient financing and imperfection of state regulation of industrial development, especially in high-tech industries [14].

The authors propose to forecast the indicators of development of high-tech industry in Ukraine in six stages (Fig. 2).

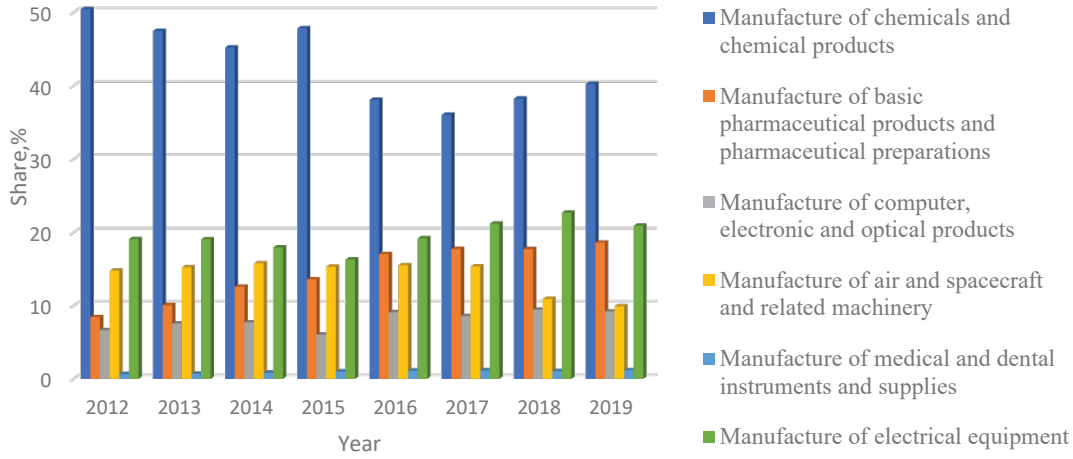


Fig. 1 – Dynamics of the structure of the high-tech sector of industry in Ukraine, 2012–2019,%.

Source: built by the authors using [12]

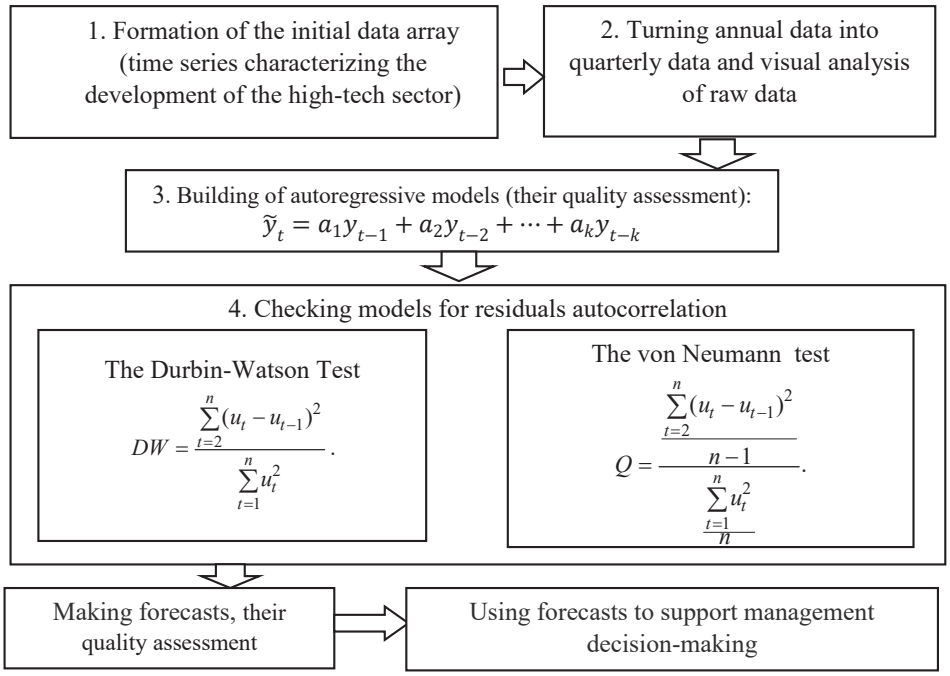


Fig. 2 – Stages of forecasting indicators of development of the high-tech industry sector

Source: made by the authors

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The first stage is the formation of an array of initial data. The data of the State Statistics Service of Ukraine on the volume of industrial products produced by enterprises of the high-tech sector [12], which are presented in Table 1, are used as input data.

At the second stage, in order to increase the sample size, the annual data were transformed into quarterly data. For this purpose, coefficients characterizing the ratio of the number of days in the quarter to the number of days in the year were used, conditionally assuming that the volume of production in the relevant industry is constant every day of the year. As a result of the transformations, a time series of 32 values was obtained.

At the third stage, first-order autoregressive models were built, taking into account the results of the autocorrelation test (autocorrelation coefficients of the first order were the highest). The first 30 values of the considered time series were used to build autoregressive models, the last two values were used to assess the quality of forecasts determined by the models. The results of the estimation of parameters and quality of autoregressive models are shown in Table 2.

Models (1)-(6) are qualitative because the coefficient of determination is close to 1 and statistically significant.

At the next, fourth stage, models (1)-(6) were tested for residuals autocorrelation using two criteria: the Neumann and Durbin-Watson. The results are shown in Table 3.

The values of the criteria indicate that there is no correlation of the residuals in the models.

At the fifth stage the forecasts were built, the results of forecasting by models (1)-(6) are shown in Fig. 3.

To evaluate the quality of forecasts we used the mean absolute percentage error (MAPE) indicator, which is 0,55% for model (1), 0,55% for model (2), 1,9% for model (3), 0,64% for model (1) 4), 2,6% for model (5) and 1,26% for model (6). The forcasts are accurate, because the MAPE is less than 10%.

According to the results of the forecast, it can be concluded that in the 4th quarter of 2020 the volume of manufacture of chemicals and chemical products is expected to increase by 1.7% as compared to the corresponding period of the previous year; the manufacture of basic pharmaceutical products and preparations by – 2.2%; computer, electronic and optical products will increase by – 10.2%; medical and dental instruments and supplies will increase by 13.2% and the manufacture of electrical and electronic equipment by 7,5%. The volume of manufacture of air and space aircraft and related machinery will decrease by 0.37%.

## Conclusions

The authors made an analysis of the dynamics of the output volume of industrial products of the high-tech sector, which consists of the following types of economic activity: manufacture of chemicals and chemical products; manufacture of basic pharmaceutical products and preparations; manufacture of computers, electronic and optical products; manufacture of air and space aircraft, related machinery; manufacture of medical and dental instruments and materials; manufacture of electrical equipment. On the basis of the analysis, it was found that the production volumes of almost all of the above types of products are increasing insignificantly, while the manufacture of air and spacecrafts and related machinery, electrical and electronic equipment is decreasing.

The forecast of indicators of development of Ukrainian high-tech industry in six stages is proposed. As a result of the calculations a number of autoregressive models of the first order was obtained. All built models are qualitative and statistically significant. The built models were tested for autocorrelation of residuals according to two criteria: the Durbin-Watson and Neumann. According to the results of the calculations, it was found that there is no autocorrelation in the models. The forecasts based on models (1)-(6) are qualitative, because the mean absolute percentage error (MAPE) is less than 10%.

The forecasting results indicate the persistence of trends in the industries under study. The results of the study

Table 2 – Autoregressive models

| Indicator name | Autoregressive model equation |
|---|---|
| Manufacture of chemicals and chemical products ($MCP_t$) | $\widehat{MCP_t} = 1,01 \times MCP_{t-1}$ $R^2$= 0,993..(1) |
| Manufacture of basic pharmaceutical products and pharmaceutical preparations ($MPP_t$) | $\widehat{MPP_t} = 1,006 \times MPP_{t-1}$ $R^2$= 0,993 (2) |
| Manufacture of computer, electronic and optical products ($MCEOP_t$) | $\widehat{MCEOP_t} = 1,025 \times MCEOP_{t-1}$ $R^2$= 0,994 (3) |
| Manufacture of air and spacecraft and related machinery ($MSRM_t$) | $\widehat{MSRM_t} = 0,999 \times MSRM_{t-1}$ $R^2$= 0,996 (4) |
| Manufacture of medical and dental instruments and supplies ($MMDIS_t$) | $\widehat{MMDIS_t} = 1,032 \times MMDIS_{t-1}$ $R^2$= 0,996 (5) |
| Manufacture of electrical equipment ($MEE_t$) | $\widehat{MEE_t} = 1,018 \times MEE_{t-1}$ $R^2$= 0,995 (6) |

Source: built by the authors

Table 3 – Results of checking models (1) – (6) for residuals autocorrelation

| Criterion | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) | Model (6) |
|---|---|---|---|---|---|---|
| von Neumann | 2,039 | 2,039 | 2,267 | 2,074 | 2,438 | 2,182 |
| Durbin-Watson | 1,964 | 1,964 | 2,183 | 1,997 | 2,347 | 2,101 |

Source: calculated by the authors

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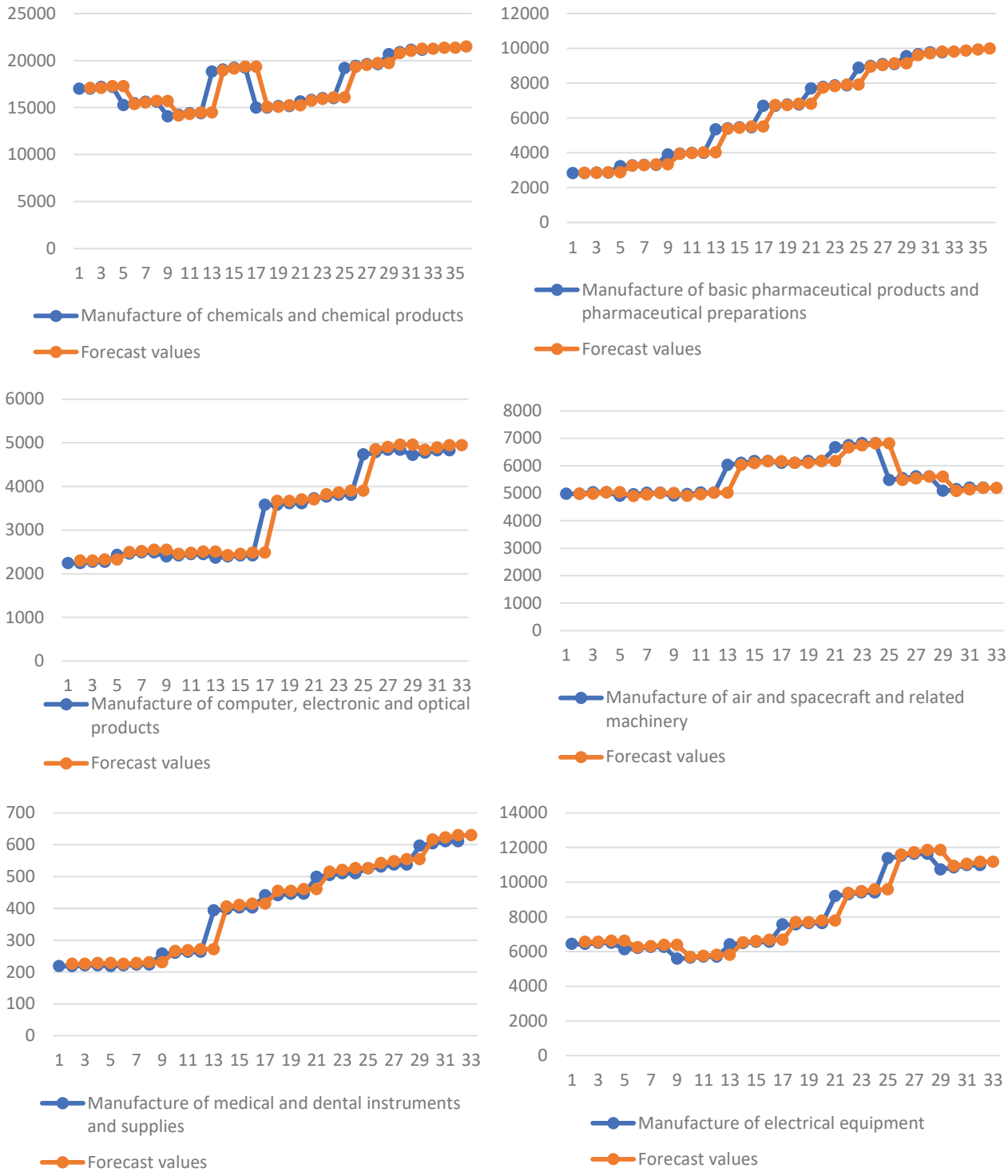


Fig. 3 – The results of forecasting the production volumes of industrial products by enterprises of high-tech sector in Ukraine

Source: calculated by the authors

can be used in the decision-making process to develop a strategy for the development of high-tech sector of the Ukrainian industry.

The prospect of further research of is to evaluate the effectiveness of government measures for supporting the development of high-tech sector of Ukraine.

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# ВИМОГИ ДО ОФОРМЛЕННЯ СТАТЕЙ У ФАХОВОМУ НАУКОВО-ПРАКТИЧНОМУ ЖУРНАЛІ «ФІНАНСОВІ СТРАТЕГІЇ ІННОВАЦІЙНОГО РОЗВИТКУ ЕКОНОМІКИ»

З № 2(42) 2019 року фаховий науково-практичний журнал «Фінансові стратегії інноваційного розвитку економіки» виходить лише англійською мовою. **Стаття подається до розгляду в редакцію українською мовою. Після проходження внутрішнього рецензування – обов'язкове надання перекладу статті англійською мовою.** Переклад має бути професійним, у жодному разі не використовуючи інтернет-перекладач.

До друку приймаються наукові статті обсягом від 10 сторінок, що відповідають тематиці серії видання й містять нові наукові результати, не опубліковані раніше. Виклад матеріалу статті має бути послідовним, логічно завершеним, із чіткими формулюваннями, що виключають подвійне тлумачення або неправильне розуміння інформації; мова тексту має відповідати літературним нормам, бути професійною і лаконічною. Автор зобов'язаний забезпечити високий науковий рівень викладеного матеріалу, повноту і системність висвітлення питання, достовірність результатів і даних, що наводяться, правильність цитування та посилань на літературні джерела. Редакційна колегія приймає до друку статті, які характеризуються оригінальністю, високою мірою наукової новизни і практичною значущістю.

## 1. МАКЕТ СТОРІНКИ

**Для оформлення статті автор використовує формат А4 з полями з усіх боків – 2 см. Порядок абзацу виділяється відступом 1,25.**

☞ *До уваги авторів:* У разі необхідності для шрифтових виділень у таблицях і рисунках дозволяється застосовувати шрифт Courier New (наприклад, для ілюстрації текстів програм для ЕОМ). Для стилістичного виділення фрагментів тексту слід вживати начертання *курсив*, **напівжирний**, ***напівжирний курсив*** зі збереженням гарнітури, розміру шрифта та інтервалу абзаца.

## 2. ТИПОГРАФСЬКІ ПОГОДЖЕННЯ ТА СТИЛІ

Текст статті, яка подається до розгляду та рецензування українською, має бути побудований за такою схемою:

– індекс УДК у верхньому лівому кутку аркуша (Times New Roman, 14 пт., звичайний);

– назва статті великими літерами (по центру, Times New Roman, 14 пт., напівжирний);

– ПІБ авторів (по центру, Times New Roman, 14 пт., звичайний);

– назва ЗВО (по центру, Times New Roman, 14 пт., курсив);

– повна адреса ЗВО або місця роботи автора (по центру, Times New Roman, 14 пт., курсив);

– адреса електронної пошти;

– ORCID (обов'язково);

– анотація (200–250 слів), яка містить стисле формулювання змісту статті (вирівнювання – по ширині сторінки, Times New Roman, 14 пт., звичайний);

– ключові слова (до 10 слів) (вирівнювання – по ширині сторінки, Times New Roman, 14 пт., курсив);

Після цього з абзацу викладається основний текст статті (вирівнювання – по ширині сторінки, Times New Roman, 14 пт., міжрядковий інтервал 1,5).

Структура основної частини рукопису українською мовою:

**І. Постановка проблеми** в загальному вигляді та її зв'язок з важливими науковими чи практичними завданнями.

**ІІ. Аналіз останніх досліджень і публікацій,** у яких започатковано розв'язання даної проблеми і на які спирається автор (з обов'язковими посиланнями в тексті на використану наукову літературу!!!), виділення невирішених раніше частин загальної проблеми, котрим присвячується стаття.

**ІІІ. Формулювання цілей статті** (постановка завдання).

**IV. Виклад основного матеріалу дослідження** з повним обґрунтуванням отриманих наукових результатів.

**V. Висновки і перспективи подальших досліджень** у даному напрямку.

**VI. Література.** Оформлюється відповідно до вимог Національного стандарту України ДСТУ 8302:2015.

**ЛИШЕ ПІСЛЯ ПРОХОДЖЕННЯ ВНУТРІШНЬОГО РЕЦЕНЗУВАННЯ АВТОР НАДАЄ ПЕРЕКЛАД СТАТТІ АНГЛІЙСЬКОЮ МОВОЮ.**

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Схема побудови англомовної статті аналогічна українському варіанту:

– UDC у верхньому лівому кутку аркуша (Times New Roman, 14 пт., звичайний);

– назва статті великими літерами по центру (Times New Roman, 14 пт., напівжирний);

– ПІБ авторів (по центру, Times New Roman, 14 пт., звичайний);

– назва ЗВО (по центру, Times New Roman, 14 пт., курсив);

– повна адреса ЗВО або місця роботи автора (по центру, Times New Roman, 14 пт., курсив);

– адреса електронної пошти (по центру, Times New Roman, 14 пт., звичайний);

– анотація англійською мовою розширена (1800 знаків) (вирівнювання – по ширині сторінки, Times New Roman, 14 пт., звичайний);

– ключові слова (key words) – до 10 слів – (вирівнювання – по ширині сторінки, Times New Roman, 14 пт., курсив).

☞ *До уваги авторів*: після ключових слів англійською мовою необхідно надати цей блок інформації (крім УДК) також українською, вимоги до оформлення зберігаються.

Структура основної частини статті англійською мовою

(вирівнювання – по ширині сторінки, Times New Roman, 14 пт., міжрядковий інтервал 1,5):

**I. Statement of the problem** (Постановка проблеми).

**II. Analysis of recent studies and publications** (Аналіз останніх досліджень і публікацій).

**III. Objectives of the article** (Формулювання цілей статті).

**IV. The main material of the research** (Виклад основного матеріалу дослідження).

**V. Conclusions** (Висновки).

**VI. References** (Література), оформлюється за міжнародним бібліографічним стандартом. Приклади оформлення: http://journalsofznu.zp.ua/References.pdf

**ВАЖЛИВО!** Кожен рисунок включається до тексту у вигляді одного графічного об'єкта (положення об'єкта «В тексте»).

**ДЛЯ ОПУБЛІКУВАННЯ СТАТТІ АВТОРУ НЕОБХІДНО:**

***надіслати на електронну пошту редакції збірника konf.econom.znu@gmail.com***

1. Текст статті, оформлений відповідно до встановлених вимог.

2. Витяг із протоколу засідання кафедри з рекомендацією статті до друку (скан. копію).

3. Рецензію доктора або кандидата наук із відповідної галузі науки, завірену відповідним підписом та печаткою установи, яка є зовнішньою по відношенню до ЗНУ та установи, де працює автор (автори) статті (скан. копію).

4. Відомості про автора (авторів) у вигляді таблиці (бажано у файлі формату .xls):

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

Кожній статті, починаючи з № 4 2018 року, присвоюється DOI.

***Адреса редакції фахового науково-практичного журналу «Фінансові стратегії інноваційного розвитку економіки»:*** Україна, 69600, м. Запоріжжя, МСП-41, вул. Жуковського, 66.

***Довідки за телефонами:***

*(096) 485-31-99 – відповідальний за випуск, технічний редактор – заступник декана з наукової роботи економічного факультету ЗНУ Линенко Андрій Володимирович,*

*(061) 228-76-41 – відповідальний редактор – д.е.н., проф. Бабміндра Дмитро Іванович,*

*(061) 228-76-13 – головний редактор – д.е.н., проф. Череп Алла Василівна (V корпус, кімн. 116).*

Збірник наукових праць

# ФІНАНСОВІ СТРАТЕГІЇ ІННОВАЦІЙНОГО РОЗВИТКУ ЕКОНОМІКИ

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Видавництво і друкарня – Видавничий дім «Гельветика»
69063, Україна, м. Запоріжжя, вул. Олександрівська, 84, оф. 414
Телефони: +38 (095) 934 48 28, +38 (097) 723 06 08
E-mail: mailbox@helvetica.com.ua
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