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„Bogdan Petriceicu Hasdeu”***



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**INCREASINGS ENVIRONMENTAL EFFICIENCY DIRECTIONS IN THE  
CONTEXT OF ENSURING ECONOMIC STABILITY UNDER ECONOMIC  
GLOBALIZATION CONDITIONAL**

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**Abstract.** *The article has been devoted to issues sustainable development. The differences between the Global Sustainable Competitiveness Index (GSCI) and The Global Competitiveness Index (GCI) have been considered in the article. It has been proved that ecology is an important component of sustainable development. Country ratings for both indices were built. There have been significant differences between the leaders in both rankings: the first place in the ranking by GSCI has been occupied by Sweden with a score of 60.6. According to The Global Competitiveness Index (GCI), Singapore ranks first position (84.8), but in the Global Sustainable Competitiveness Index, this country rank 41st.*

*In the article, The 2018 Efficiency Index (EPI) has been considered. This index make it possible to assess at the national level how close the countries are to the established goals of environmental policy, as well as the goals of sustainable development in the global environment. It has been detected, that by regions of the world, the highest indicators of the environmental efficiency index are occupied by European countries – the first 17 countries in the ranking with a value of more than 75.9.*

*It has been justified Key strategies of action on economic entities in order to ensure sustainable economic development.*

**Key words:** *environmental efficiency, ensuring economic stability, development, economic globalization, strategy*

**JEL classification:** F 64

**UDC:** 504:332

### **1. Introduction**

The economic systems development under market conditions significantly depends on the economic stability level, so in recent years, sustainable development is one of the priority strategic objectives. Changes in economic activity, for example, the crisis in the real economy and financial system, have significantly affected the sustainability of economic entities, demonstrated their weaknesses, unpreparedness, extremely low flexibility and adaptability to overcome existing difficulties. In recent years, the practice of enterprises has proved the relevance of ensuring their economic stability.

Environmental efficiency is an important component of the sustainable development of market participants and countries in general. In 1992, the concept of sustainable development was adopted in Rio de Janeiro. This concept provides for harmonious development, which provides a balance between environmental, economic and social components. The need to conduct research on the economic stability formation and the impact of the ecological factor on this indicator is primarily related to the uneven distribution of resources, impact on society, opportunities, expectations and threats to the future. Also, the paradigm of economic stability has been caused by the need for fundamental research on the nature of economic relations in the context of globalization. Such threats are particularly acute for economic resilience in economic crises.

Any economic activity has an active impact on the environment. Similarly, consumption influences the environment state. Thus, the development of mechanisms for balanced development and ensuring economic stability and environmental efficiency is relevant and necessary.

## **2. The degree of investigation of the problem currently**

Problems of combining environmental efficiency and economic sustainability in the context of economic globalization are studied by many scientists, in particular H.Bossel, A.Bockermann, S.O.Funtowicz, B.Meyer, J.H.Spangenberg, J.Malek, L.Melnyk, D.W.Pearce, C.Rammel, Iu. Samoilyk, I.Serageldin [1-3, 7-18]. The Spangenberg's paper derives suggestions for criteria of the sustainability of the economy, and in particular its economic and environmental sustainability [17, 18]. Research and modeling of indicators of sustainable development were also devoted to works of H.Bossel, A.Bockermann, I.Omann, I.Serageldin [1-3, 15]. The article of C.Rammel and J.C.J.M. van den Bergh describe the areas of minimizing the risks of sustainable development [12]. The Malek's study has identified 29 enablers of sustainable manufacturing. Interpretive Structural Modeling has been utilized by Malek to develop a hierarchy structural model which can represent the interrelationships among the enablers of sustainability [7]. The methodology of Priyadarshini and Abhilash incorporates a quantitative assessment of social, ecological and economic indicators of agricultural sustainability in India. An umbrella policy (National Policy on Eco-Agri-Food Systems) has been proposed by authors for sustainable management of the country's entire agricultural value chain. [11]. Svystun L. studies the components of agricultural areas economic stability [13].

Despite the significant number of works on issues of economic stability, this issue does not lose its relevance. In addition, the environmental problems of ensuring the economic systems sustainability remain unresolved. Thus, research in this direction is topical.

## **3. The purpose of research**

The purpose of research is a study of economic systems patterns development, identification and evaluation of key indicators characterized the management systems economic stability, identification of the place of the environmental factor in the system of economic stability indicators; development of recommendations for improving environmental efficiency in the context of ensuring economic sustainability under the economic globalization conditional.

## **4. Methods and materials applied**

For the research, it has been used data by World Economic Forum. The analysis presented in the Global Competitiveness Report 2019 is based on a methodology integrating the latest statistics from international organizations and a survey of executives. The methodology, developed in collaboration with leading experts and practitioners through a three-year consultative process, is designed to support countries to identify relevant policies and practices. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the World Economic Forum. The Report presents information and data that were compiled and/or collected by the World Economic Forum.

The of The Sustainable Competitiveness Index would have been calculated by data and time series made available by the World Bank Indicator database, various UN agencies (UNDP, UNEP, UNICEF, FAO, WHO, WMO, [www.data.un.org](http://www.data.un.org)), the International Monetary Fund (IMF), and other non-governmental organisations (including Transparency International, Reporters without Borders, The New Economics Foundation, The Institute for Economics and Peace, The Fund For Peace, the Joint Global Change Research Institute).

It has been used global metrics for the environment by Yale Center for Environmental Law & Policy, Yale University Center for International Earth Science Information Network, Columbia University in collaboration with the World Economic Forum with support from The McCall MacBain Foundation and Mark T. DeAngelis.

## **4. Results obtained and discussions**

The economic stability is a combination of the different elements (financial, production, personnel, marketing, investment, and management), relationships to ensure the stable economic system operation, rapid response to external and internal threats, maintaining the economic system

state within acceptable limits deviations from the plan and strategy. Economic stability ensures the most efficient operation of all economic system elements.

On a world level, the Global Sustainable Competitiveness Index (GSCI) has been developed. This index allows assessing the achieved economic stability level of countries in the world through the prism of their competitiveness.

The Global Sustainable Competitiveness Index (GSCI) has been developed by SolAbility on a global level for all countries of the world.

SolAbility is an independent sustainability think-tank and advisory, with presence in Korea and Switzerland. SolAbility is the maker of 3 DJSI Super-Sector Leaders. We have designed and implemented the sustainable management for GS Engineering & Construction (DJSI Global Industry leader 2012), Korea Telecom (DJSI Global Industry Leader 2011-2013, 2015), and Lotte Shopping (DJSI Global Industry Leader 2011-2015) [22]. The Global Sustainable Competitiveness Index (GSCI) measures the total competitiveness – now, and the potential into the future – of nation-economies. Sustainable competitiveness is the ability to generate and sustain inclusive wealth without diminishing the future capability of sustaining or increasing current wealth levels. The GSCI is the most comprehensive measurement of the competitiveness of nation-states – both as-is, and with respective to future potential [22] (Table. 1).

Table 1. Structure of The Global Sustainable Competitiveness Index (GSCI)

Category	Indicators	Numbers of Indicators
Natural Capital Indicators	Fossil energy prevalence (% of total); Food Production Index; Renewable freshwater availability/capita; Endangered species; Electricity from hydropower (%); Energy self-sufficiency; Forest area (% of total); Land area below 5 m (% of total); Arable land (ha/capita); Population living below 5m (% of total); Potential arable land (ha/capita); Average rainfall (mm); Land degradation (% of total); Biodiversity Benefit Index (GEF); Land at risk of desertification; Fertilizer consumption/ha; Extreme weather incidents; Tourist attractiveness; Mineral reserves (per GNI and capita); Ocean Health Index; Population density; Natural resource depletion (as percentage of GNI)	22
Resource Intensity Indicators	Transmission losses; Freshwater withdrawal rate; Ecological consumption footprint; Water productivity; NOx emissions per GDP; Steel usage efficiency per capita (T/CAPITA); NOx emissions per capita; Air pollution – mean particule concentration; Energy per GDP; Air pollution exposure – population; Energy per capita; Hazardous waste per GDP; CO2 emissions / GDP; Electricity consumption / GDP; CO2 emissions /capita; Water usage per capita; Electricity consumption per capita; Waste per capita; Electricity from coal (%); Waste per GDP; Electricity from oil (%); SO2 emission per GNI; Renewable electricity excluding hydro (%); SO2 emissions per capita	24
Social Capital Indicators	Doctors per 1000 people; Overweight; Hospital bed availability; Teen moms; Nurses per 1000 people; Life expectancy; Child mortality (below age 5, death per 1000); Obesity rate; Public health spending (% of total health spending); Income quintile ratio; Suicide rate; GINI coefficient (income distribution inequality); Prison population rate (per 100000 people); Human rights index; Homicide rate (per 100000 people); Women in parliament (% of MPs); Peace Index; Birth per woman; Press Freedom Index; Aging society; Public health expenditure of total expenditure	22
Intellectual Capital Indicators	Primary education completion; Spending per student (% of per capita GDP); Primary student repetitions; Patent applications per 1 million people; Secondary education enrolment; Patent applications (per GDP); Tertiary education enrolment; New business registrations per 1 million people; Spending on education (% of state expenditure); Trademark applications; Pupil-teacher ratio; R&D FTEs per million people; Pupil gender ratio; R&D spending; School dropouts secondary; High tech exports; Education spending (% of GDP)	17
Governance Efficiency Indicators	Internet availability; GNI per capita; TI CPI Index; Non-renewable resource income dependency; Bribery payments – % of businesses; Bank capital-asset ratio; Employment in the service sector; Market fluctuation exposure: stock trading volume (% of GDP); Employment in the manufacturing sector; Market fluctuation exposure: company value (% of GDP); Manufacturing value added; Imports (% of GDP); Unemployment; Population (total); Investments; Market fluctuation exposure: stock trading volume (% of GDP); Austerity Index; Market fluctuation exposure: company value (% of GDP); Quality of public services; Imports (% of GDP); Poverty development; Population (total); Military spending (% of total government spending); GNI (total); Rail network per area & population; Ease of doing business; Government debt; Access to electricity	27
Total		111

Source: summarized by authors by [19, 22]

The Global Sustainable Competitiveness Index (GSCI) includes five groups of indicators: Natural Capital Indicators, Resource Intensity Indicators, Social Capital Indicators, Intellectual Capital Indicators, Governance Efficiency Indicators.

Globalization and the Fourth Industrial Revolution have created new opportunities but also disruption and polarization within and between economies and societies. In this context, the World Economic Forum introduced last year the new Global Competitiveness Index 4.0, a much-needed new economic compass, building on 40 years of experience of benchmarking the drivers of long-term competitiveness. The index is an annual yardstick for policy-makers to look beyond short-term and reactionary measures and to instead assess their progress against the full set of factors that determine productivity. These are organized into 12 pillars: Institutions; Infrastructure; ICT adoption; Macroeconomic stability; Health; Skills; Product market; Labour market; Financial system; Market size; Business dynamism; and Innovation capability [21] (Tabl. 2).

Table 2. Structure of The Global Competitiveness

Pillar	Category	Indicators	Numbers of Indicators
Institutions	Public	Property rights	2
		Ethics and corruption	3
		Undue influence	2
		Government efficiency	6
		Security	4
	Private	Corporate ethics	1
		Accountability	4
Infrastructure	Transport infrastructure	Roads, ports, railways, air	5
	Electricity and telephony infrastructure	Electricity supply, mobile/fixed line availability	3
Macroeconomic environment		Budget balance, savings, inflation, debt, credit rating	5
Health and primary education	Health	Malaria, tuberculosis, HIV, life expectancy, child mortality rate	8
	Primary education	Quality and enrolment	2
Higher education and training	Quantity of education	Secondary and tertiary enrolment	2
	Quality of education	Quality of schools and teaching, internet access in schools	4
	On-the-job training	Training and availability of training	2
Goods market efficiency	Competition	Domestic competition (competition, taxation, business barriers)	8
		Foreign competition (trade tariffs, custom proceedings, FDI, imports)	6
	Quality of demand conditions	Customer orientation, buyer sophistication	2
Labour market efficiency	Flexibility	Management-labour relations, hiring/firing freedom, redundancy cost, taxation	5
	Efficient use of talent	Pay & productivity, brain drain, female participation	4
Financial market development	Efficiency	Availability and affordability of capital and venture capital	5
	Trustworthiness and confidence	Soundness of banking systems, security market regulation	3
Technological readiness	Technological adoption	Technology availability, technology transfers	3
	ICT use	Availability and speed of communication infrastructure	6
Market size	Domestic market size	Domestic market size index	1
	Foreign market size	Foreign market size index	1
Business sophistication	Supply, production, value chain utilisation, marketing	Supplier quantity and quality, production sophistication, value chain depth, marketing capabilities	10
R&D Innovation	Research availability and spending	Researcher availability & quality, research institutions and capabilities, R&D expenditure, government procurement, patent applications	8
Total			115

Source: summarized by authors by [19, 21]



Probably the most famous "competitiveness" index is the "Global Competitiveness Report", annually published by and at the World Economic Forum (WEF).

There are many different "indexes", published by different organisations, ranking nations against each other in all possible (and, sometimes, impossible) different criteria. Amongst them are several indexes that in some way or another refer to "competitiveness" is in other words, indexes that rank countries according to their ability to create wealth, and the outlook for sustaining or increasing current wealth. However, the definition of competitiveness in a conventional approach tends to focus on economic and financial aspects of any given economy, and is based on momentary pictures in time. This approach has two main limitations: the focus on economic and financial performance aspects assumes that an economy works within an air-tight space independent of its physical environment (i.e. independent of the actual land it is built on); does not take into account the ramifications of current economic activities on the future economic development and wealth creation capabilities [19].

Through the inclusion of the so-called "non-financial" characteristics of national economies (the land that an economy is built upon, resource efficiency, and the way societies ensure equal opportunities, and distribute wealth and services amongst its citizens), the Sustainable Competitiveness Index aims at developing a broader picture of competitiveness that incorporates the normally omitted factors, which are essential pillars of an economy that is not built on borrowed time but is able to sustain growth and wealth into the future. Different interpretations of different data sets or surveys analysed and put into indexes or rankings can open interesting new perspectives, regardless of the accuracy and real-life relevance of the index. However, real-life relevance and correlations to actual success factors depend on a) the source and reliability of the raw data, and b) the definition of "competitiveness" that underlies a specific index. The definition or understanding of the term "competitiveness" guides the selection of competitiveness indicators and their analysis, i.e. the aspects of an economy that define the competitiveness of a nation according the point of view of the publishing organisation or the individuals behind the index. It is therefore not really surprising that different "competitiveness" rankings come up with very different results [19].

The countries ranking according to the Global Sustainable Competitiveness Index (GSCI) have been formed. The first place in the ranking in 2019 has been occupied by Sweden with a score of 60.6, Finland (59.5), and Iceland (57.3) have been occupied the second and third positions respectively. It should be noted that the leading positions in this ranking have been occupied by European countries (Fig. 1).

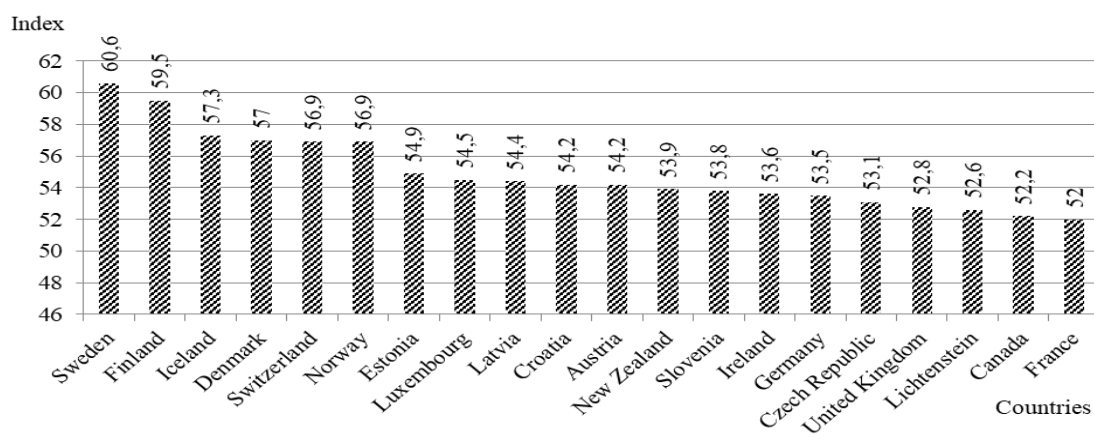


Figure. 1. The TOP-20 countries of the world by The Global Sustainable Competitiveness Index (GSCI) Rankings 2019

Source: created by authors by [22]

In this rankings, the lowest positions have been occupied by Iraq (25,2), Singapore (24,9), Israel (24,9), Jordan (23,9), Lebanon (20,5). It is worth noting that Singapore has been occupied in 2019 the first position by the ranking of The Global Competitiveness with score 84,8. It has been on 1.3 more compared with last year.

According to The Global Competitiveness Index, Singapore ranks first position (84.8), followed by the United States and Hong Kong, respectively. Countries such as the Netherlands, Switzerland, Japan, Germany, Sweden, and the United Kingdom also have high rates (Figure 2).

The success of nations currently is mostly expressed in their economic output – GDP, and GDP per capita, GDP growth. The GDP or GNI, however, are limited to the current economic output, and do not evaluate underlying structures. The best-known competitiveness ranking is the WEF's Competitiveness Index. However, the WEF index is flawed, both methodically and in terms of indicators considered. The US is a big economy, but the 2nd most competitive economy. The US has MS, Google and precision military hardware; people don't buy American cars because they are not competitive [21].

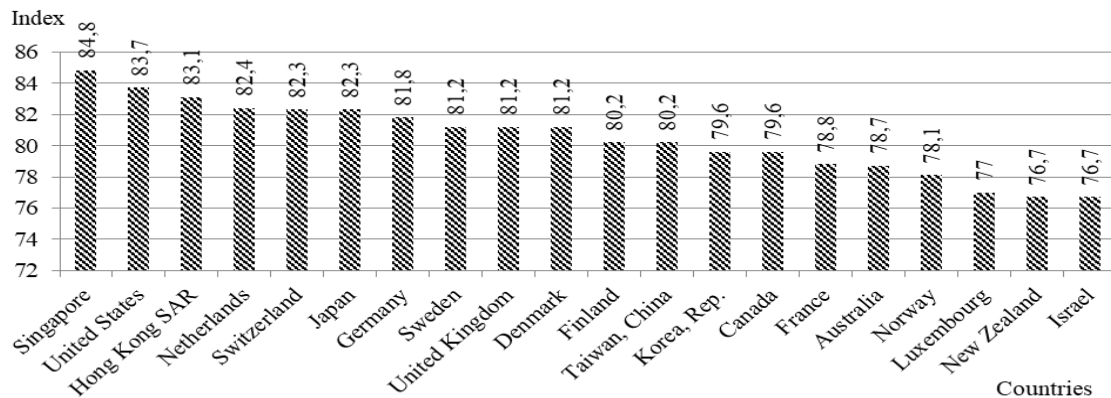


Figure 2. The TOP-20 countries of the world by The Global Competitiveness Index (GCI) Rankings 2019

Source: created by authors by [21]

Next Figure 3 shows some of the most striking differences between the WEF-Index and the Global Sustainable Competitiveness Index.

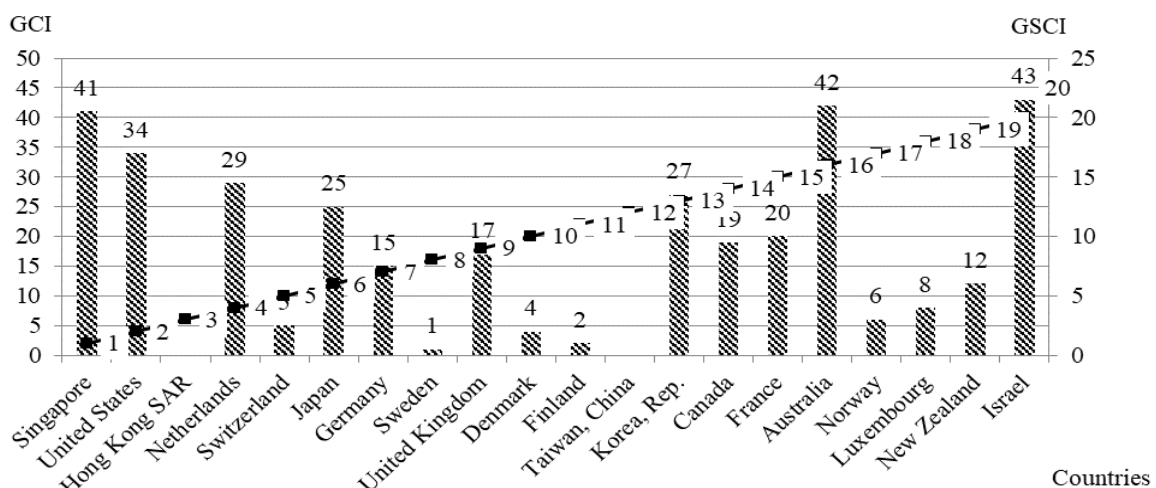


Figure 3. Comparison of rankings by The Global Competitiveness and The Global Sustainable Competitiveness Indexes 2019

Source: created by authors by [21]

A comparison of the both rankings leaders shows that Singapore ranks first position in the Global Competitiveness Index, but in the Global Sustainable Competitiveness Index, this country rank 41st. Similarly, the United States ranks 2 and 34 in both rankings respectively. The positions of the Netherlands are 4 and 29 positions.

By regions of the world, 60 % of the leading positions by The Global Competitiveness is the countries of North America and Europe, 30 % is countries of Souse Asia, 10 % is countries of Midle East.

90 % of the leading positions by The Global Sustainable Competitiveness Index is the countries of North America and Europe (Figure 4).

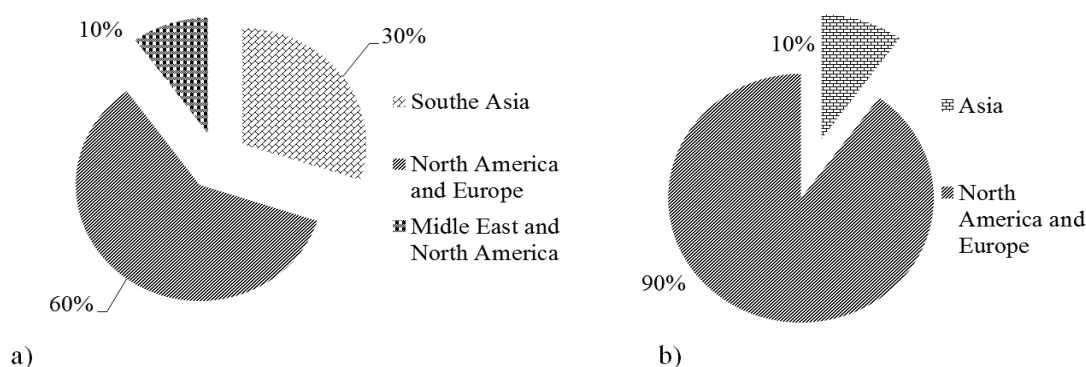


Figure 4. Distribution of countries – leaders (TOP-20) in the rankings by region of the world

a) The Global Competitiveness Index Rankings;

b) by the Global Sustainable Competitiveness Index (GSCI) Rankings)

Source: created by authors by [21, 22]

Most countries around the world are concerned about the deterioration of the environment. To assess environmental trends, each country uses both general and specific indicators. For a global comparison, the most comprehensive is the methodology developed by Yale University in the United States [20], which provides for the calculation of an integrated indicator – the Environmental Performance Index (EPI). The 2018 Efficiency Index (EPI) was calculated for 180 countries on 24 performance indicators in ten categories covering environmental health and ecosystem viability. These indicators make it possible to assess at the national level how close the countries are to the established goals of environmental policy, as well as the goals of sustainable development in the global environment (Fig. 5).

By regions of the world, the highest indicators of the environmental efficiency index are occupied by European countries – the first 17 countries in the ranking with a value of more than 75.9.

These values emphasize the sustainable relationship between the level of economic and environmental development. The higher the level of economic activity and quality of life in the country, the more attention is paid to environmental policy. European environmental protection is one of the strictest among the regions of the world. European countries are constantly paying attention to the goals of sustainable development in shaping their strategy. Also, the leading countries have a significant natural and climatic potential, which with proper economical use can ensure sustainable development of countries in its classical interpretation. In the region of Tropical Africa, the leading position is occupied by the Seychelles with an environmental performance index of 66.02, in the overall ranking is 39 positions. The countries of this region are mostly in the last positions of this rating.

The environmental efficiency index does not primarily characterize the state of the environment, but the activity and effectiveness of environmental policy and the country's proximity to sustainable development goals. African countries ecological state can be described as average, while active measures to achieve sustainable development goals in the region are not carried out. A negative

phenomenon for the ecology of developing countries is the placement of waste from developed countries on their territory. Among the Caribbean countries, Trinidad and Tobago leads with an index of 67.36, among Latin American countries – Costa Rica (67.85). These regions are relatively environmentally friendly with significant natural potential, and the government puts environmental issues at a high position along with strategically important issues. In Asian continent, the leader in the environmental efficiency index is Japan – 74.69. It should be noted that this indicator has been calculated without taking into account radiation pollution. Japan, as a leader in the economy, input a lot of attention and investment in environmental innovations. Israel, a leader in Central Asia and North Africa by the Environmental Performance Index, makes a major contribution to solving environmental problems. In the region of Eastern Europe and Eurasia (which also includes Ukraine), Slovakia leads in the Environmental Efficiency Index with an index of 70.6. The leaders of the region also include Lithuania, Bulgaria, the Czech Republic, and Slovenia, with an environmental efficiency index of more than 67. In total, 29 countries in the region have been selected to evaluate this indicator. In last place has been occupied by Bosnia and Herzegovina (41.84) and Uzbekistan (45.88). Ukraine ranks 25th in the region and 109th in the world with a value of 52.87.

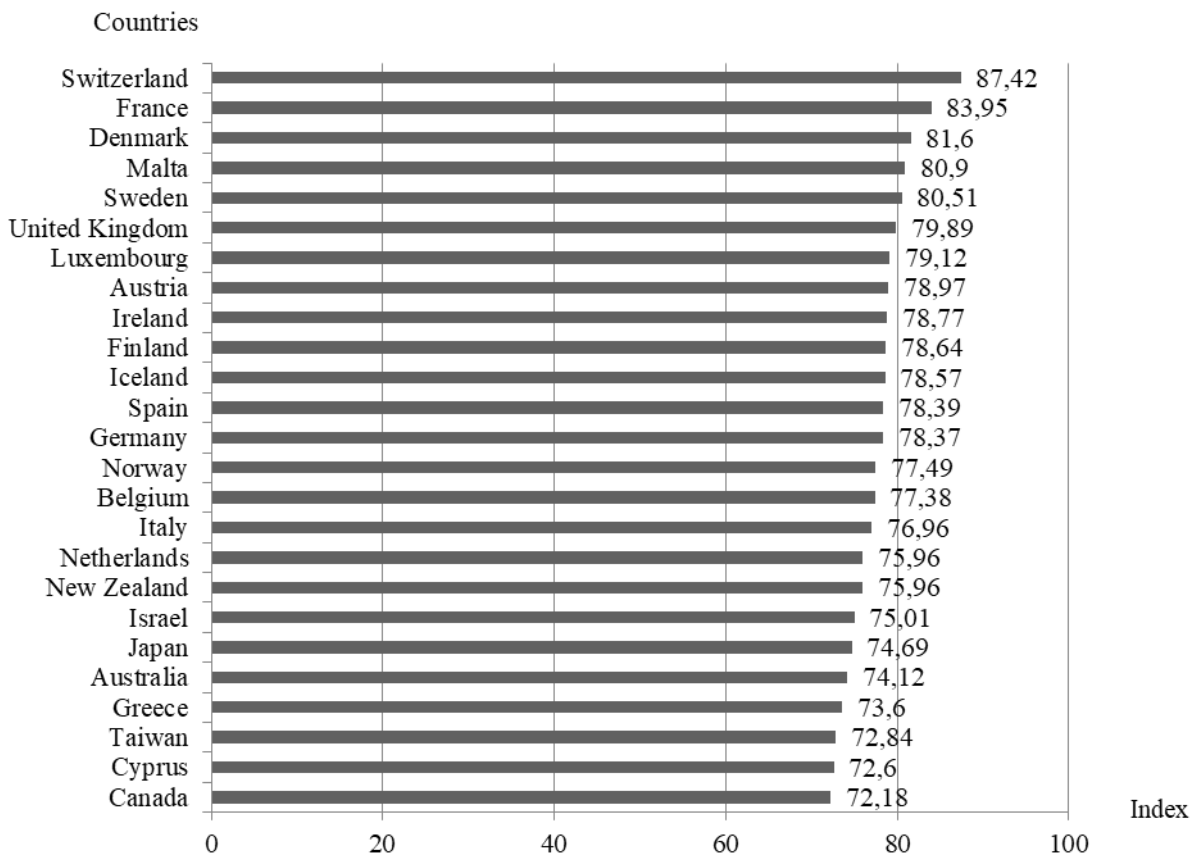


Figure 5. The TOP-25 countries of the world by The Environmental Performance Index (EPI) 2018  
Source: created by authors by [20]

A number of striking conclusions emerge from the EPI rankings and indicators. First, good policy results are associated with wealth (GDP per capita), meaning that economic prosperity makes it possible for nations to invest in policies and programs that lead to desirable outcomes. This trend is especially true for issue categories under the umbrella of environmental health, as building the necessary infrastructure to provide clean drinking water and sanitation, reduce ambient air pollution, control hazardous waste, and respond to public health crises yields large returns for human well-being. Second, the pursuit of economic prosperity – manifested in industrialization and urbanization – often means more pollution and other strains on ecosystem vitality, especially in the developing world,

where air and water emissions remain significant. But at the same time, the data suggest countries need not sacrifice sustainability for economic security or vice versa. In every issue category, we find countries that rise above their economic peers. Policymakers and other stakeholders in these leading countries demonstrate that focused attention can mobilize communities to protect natural resources and human well-being despite the strains associated with economic growth. In this regard, indicators of good governance – including commitment to the rule of law, a vibrant press, and even-handed enforcement of regulations – have strong relationships with top-tier EPI scores. Third, while top EPI performers pay attention to all areas of sustainability, their lagging peers tend to have uneven performance. Denmark, which ranks number 1, has strong results across most issues and with leading-edge commitments and outcomes with regard to climate change mitigation. In general, high scorers exhibit long-standing policies and programs to protect public health, preserve natural resources, and decrease greenhouse gas emissions. The data further suggest that countries making concerted efforts to decarbonize their electricity sectors have made the greatest gains in combating climate change, with associated benefits for ecosystems and human health. We note, however, that every country – including those at the top of the EPI rankings – still has issues to improve upon. No country can claim to be on a fully sustainable trajectory. Fourth, laggards must redouble national sustainability efforts along all fronts. A number of important countries in the Global South, including India and Nigeria, come out near the bottom of the rankings. Their low EPI scores indicate the need for greater attention to the spectrum of sustainability requirements, with a high-priority focus on critical issues such as air and water quality, biodiversity, and climate change. Some of the other laggards, including Nepal and Afghanistan, face broader challenges such as civil unrest, and their low scores can almost all be attributed to weak governance [20].

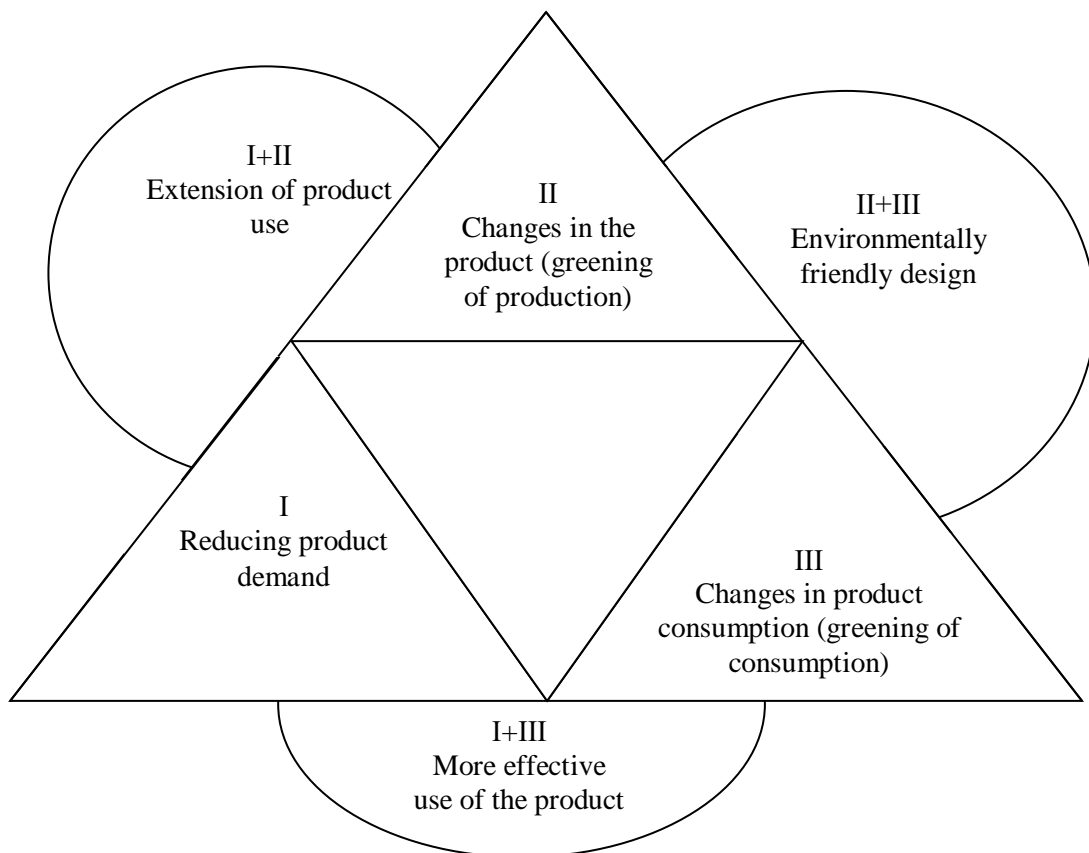


Figure. 6. The scheme of strategy implementation of the influence on the subjects in order to ensure environmentally sustainable economic development

Source: created by authors

The development of an environmentally efficient production system is directly related to the development of environmental demand. The ecological production transformation includes four stages of ecological demand formation, which include:

- 1) development of ecological equipment;
- 2) environmentally improvement of technologies;
- 3) increase the products and services life cycle components efficiency;
- 4) production of goods that serve a fundamentally new (environmentally friendly) lifestyle.

Under market conditions, the mechanisms of economic relations regulation between economic entities are implemented through the interaction of supply and demand. Action on these two market components and the area that connects them is the initial prerequisite for the formation of key strategic schemes for the management of ecology processes. Key strategies of action on economic entities in order to ensure sustainable economic development is next: action on supply (production); effect on demand (consumption); impact on the interface environment, ie the relationship between producers and consumers (Figure 6).

The essence of the first strategy is the stability of economic units that connect specific producers and consumers. The essence of the second strategy is to form a system of motivational influence, which would push producers to switch to "green" products. The essence of the third strategy is to economically force or psychologically persuade the consumer to switch to more environmentally friendly products.

The correct target orientation is an extremely important condition for achieving sustainable development on a global scale. The implementation of the sustainable environmental development strategy should be based on a number of principles (Table 3).

Table 3. Principles of economic and environmental goals unity

The name of the principle	Content of the principles
Economization of environmental factors	Indicators that characterize the impact of the economy on the environment should have, in addition to natural, also cost estimates.
Greening of economic factors	The main economic indicators and assessments of the economic results of society activities should be supplemented by assessments of the environmental consequences.
Economic responsibility for environmental effects	The economic costs caused by the negative impact on the environment must be compensated by those economic entities (state, enterprise, consumer) that are responsible for the environmental consequences.
Environmental improvement	Reproductive processes in the economy should be built so that with each reproductive cycle less environmentally friendly and efficient economic factors are replaced by more perfect and efficient.
A combination of goals and means	Environmental interests should be laid down in the development goals formation, and economic in the selection of means to achieve them.

Source: created by authors

Consequently, environmental protection is an important component of the economic systems sustainable development strategy. Due to the high level of economic activity, the anthropogenic load on the environment is increasing. Under such conditions, a comprehensive approach to solving environmental problems is needed.

## 5. Conclusions

An economic activity influences on the environment. The development of mechanisms for balanced development and ensuring economic stability and environmental efficiency is relevant and necessary. The economic stability is a combination of the different elements, relationships to ensure the stable economic system operation, rapid response to external and internal threats, maintaining the economic system state within acceptable limits deviations from the plan and strategy.

On a world level, the Global Sustainable Competitiveness Index has been developed. This Index (GSCI) includes five groups of indicators: Natural Capital Indicators, Resource Intensity



Indicators, Social Capital Indicators, Intellectual Capital Indicators, Governance Efficiency Indicators. The first place in the ranking by GSCI has been occupied by Sweden with a score of 60.6. According to The Global Competitiveness Index (GCI), Singapore ranks first position (84.8). A comparison of the both rankings leaders shows that Singapore ranks first position in the Global Competitiveness Index, but in the Global Sustainable Competitiveness Index, this country ranks 41st. Similarly, the United States ranks 2 and 34 in both rankings respectively.

The modern world is characterized by increasing anthropogenic pressure due to increased economic activity of the world's leading countries. Under such conditions, the ecological component of economic activity deserves priority attention. Interregional and global comparisons show that the countries of Western Europe make the greatest contribution to improving the environment. According to the environmental efficiency index, Ukraine ranks 25th among 29 countries in the region of East Asia and Eurasia and 109th in the world. This position emphasizes the need to improve Ukraine's environmental policy.

Key strategies of action on economic entities in order to ensure sustainable economic development is next: action on supply (production); effect on demand (consumption); impact on the interface environment, i.e. the relationship between producers and consumers.

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## **FINANCIAL ASPECTS OF THE BELARUSIAN FOREIGN TRADE**

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**Abstract:** *The article analyses customs regulation in the EAEU and its impact on the public finance of the EAEU Member-States. The largest share of tax revenues from the foreign economic activities in the budget revenues is in Belarus among the EAEU Member-States. The tax revenues from foreign economic activities are the second largest source of the Republican budget of Belarus.*

*The problem of dependence budget revenues of the Republic of Belarus from foreign trade development indicators is identified. There were changes in the regulation foreign trade of the Republic of Belarus due to the signing of the Treaty on the EAEU. The setting of export customs duty rates applies to the national legislation of the EAEU Member-States. Import customs duties in the EAEU are distributed to the budgets of the Member-States according to the standards.*

*As the analysis showed, more revenues accounted for Belarusian import customs duties from 2012 to 2014, but there was a significant shift towards export customs duties since 2015. The article reveals that the main source of export customs duties was duties on the export of petroleum products. The tax manoeuvre in the Russian Federation from 2015 is a major influence on the tax revenues from foreign economic activities in the Republican budget of Belarus.*

**Key Words:** *foreign trade, foreign economic activities, budget revenues, tax revenues, public finance, export customs duties, import customs duties, tax manoeuvre, Belarus, EAEU*

**JEL classification:** F36

**UDC:** 336.14 (476)

### **1. Introduction**

There were changes in the regulation foreign trade of the Republic of Belarus due to the signing of the Treaty on the EAEU [21]. The framework governing foreign trade activities of the EAEU Member-States is the customs and tariff regulation. It includes such elements as the unified commodity nomenclature of foreign economic activities of the EAEU, the EAEU CCT and uniform rules of origin [14].

Customs, tariff and non-tariff regulation, bans and restrictions on foreign trade in services and intellectual property, as well as measures of an economic and administrative nature, are included in government regulation of foreign trade activities of Belarus in accordance with national legislation [16].

Different rates of import customs duties (ad valorem, specific, combined) are applied for goods imported into Belarus from third countries in accordance with the EAEU CCT. The EAEU CCT is a list of customs duty rates, ordered according to the commodity nomenclature used for classification of goods in foreign trade, formed in accordance with the principles of tariff escalation and effective tariff protection. In general, this situation is reflected in the establishment of lower rates of duties on commodities and the highest – on finished products and products with a high degree of processing.

Special protective, anti-dumping and countervailing duties are also established in addition to import customs duties to protect domestic producers.

Unified measures of non-tariff regulation of foreign trade with third countries have been introduced in the EAEU. They are based on the principles of publicity and non-discrimination and include [21]:

- prohibition of merchandise imports and (or) exports;

- quantitative restrictions of merchandise imports and (or) exports;
- exclusive right to the merchandise exports and (or) imports;
- automatic licensing (supervision) of merchandise exports and (or) imports;
- permissive procedure for merchandise exports and (or) imports.

Tariff quotas are also set for imports of agricultural products originating from third countries if similar goods are produced (mined, grown) in the EAEU in insufficient quantities.

As for the measures of non-tariff regulation in Belarus, they are established on the basis of economic policy interests or in accordance with non-economic nature [16]

Customs and tariff regulation of foreign trade has a significant impact on the public finance of the EAEU Member-States. This is due to the fact that tax revenues from foreign economic activities provide budget revenues. Table 1 shows the share of tax revenues from foreign economic activities in the revenues of the EAEU Member-States budgets for 2013-2018.

Table 1. Share of tax revenues from foreign economic activities in the revenues of the EAEU Member-States budgets [%]

Country	2013	2014	2015	2016	2017	2018
Armenia	4.3	4.2	5.3	4.7	5.9	6.3
Republic of Belarus	22.0	14.4	23.4	19.3	17.9	22.6
Kazakhstan	17.0	17.8	14.3	12.4	12.3	14.5
Kyrgyzstan	13.3	13.1	8.5	11.9	12.3	13.8
Russian Federation	38.5	37.7	24.1	19.4	17.2	18.3

Source: own study based on the [2,5,10]

In Armenia, the share of tax revenues from foreign economic activities was minimal among the EAEU Member-States and averaged 5.1% of the Republican budget revenues. The share of tax revenues averaged 14.7% in Kazakhstan, 12.2% in Kyrgyzstan, and 25.9% in the Russian Federation. The share of tax revenues did not change significantly in Armenia, Kazakhstan and Kyrgyzstan during 2013-2018, but the share of the Russian Federation decreased by 20.2% and amounted to 18.3%. The largest share of tax revenues from the foreign economic activities in the budget revenues was in Belarus among the EAEU Member-States.

## 2. Analysis of publications

An upsurge of interest in the EAEU development is associated with a scientific discussion on the Customs Code of the Eurasian Economic Union (the EAEU Customs Code) and the application of customs duties within the EAEU (V. V. Bobrova [3], S. A. Agamagomedova [1], G. F. Ruchkina and V. K. Shajdullina [18], P.A. Kadochnikov, M. G. Ptashkina [15] etc.).

## 3. The purpose of the article

Customs and tariff regulation of foreign trade has a significant impact on the public finance of the Republic of Belarus. This is also true for other EAEU Member-States, but to a lesser extent. This is due to the fact that tax revenues from foreign economic activities provide budget revenues. Therefore, it is extremely important for the Republic of Belarus to assess trends of financial aspects for further developing foreign economic activity in a changing business environment [11].

## 4. Research results

The tax revenues from foreign economic activities (tab. 2) are the second largest replenishment source of the Republican budget of Belarus (after VAT) [2]. These revenues in gross terms increased significantly over 2012-2018. Meanwhile, positive dynamics were in 2012, 2015, 2017 and 2018. There was a positive balance of foreign trade in goods and services in the same periods [9]. The sharpest drop was in 2014, which was associated with difficulties in the economies of the Republic of Belarus and its trading partners.

Table 2. Importance of tax revenues from foreign economic activities in the Republic of Belarus

Indicators	2012	2013	2014	2015	2016	2017	2018
Tax revenues from foreign economic activities, total [million BYN]	2,547.5	2,332.8	1,841.5	3,918.6	3,431.8	3,546.6	5,501.5
Share in the Republican budget revenues [%]	19.9	22.0	14.4	23.4	19.3	17.9	22.6
Growth rate [%]	168.2	91.6	78.9	212.8	87.6	103.3	155.1
Share in GDP [%]	4.8	3.6	2.4	4.5	3.6	3.4	4.5
Trade balance [million USD]	2,834.0	-2,340.9	- 488.9	100.7	- 32.0	149.3	782.6

Source: own study based on the [2, 9]

Tax revenues from foreign economic activities averaged 19.9% in the structure of revenues of the Republican budget of Belarus in 2012-2018. The smallest share (14.4%) was in 2014, the largest share (23.4%) in 2015. In 2018, the share of tax revenues from foreign economic activities increased by 4.6% compared with 2017 and amounted to 22.6%. Revenues from foreign economic activities averaged 3.8% of GDP in the analysed period. The share of tax revenues from foreign economic activities in GDP increased by 1.1% and amounted to 4.5% in 2018 compared with 2017.

It should be noted that the setting of export customs duty rates applies to the national legislation of the EAEU Member-States, and the procedure for their calculation and payment is regulated by the EAEU Customs Code. A number of export customs duties apply to goods exported from the territory of the Republic of Belarus beyond the customs territory of the EAEU Member-States: potash fertilizers, rapeseed, timber, rawhides, tanned leather, oil and petroleum products.

Import customs duties in the EAEU are paid by merchandise importers to a single treasury account opened with the national (central) bank of the country in which they are payable in accordance with the EAEU customs legislation. Import customs duties in the EAEU are paid and distributed to the budgets of the Member-States, according to the following standards: Armenia – 1.11%; Belarus – 4.56%; Kazakhstan – 7.11%; Kyrgyzstan – 1.90%; Russian Federation – 85.32% [6].

Figure 1 shows the structure of tax revenues of the Republic of Belarus from foreign economic activities.

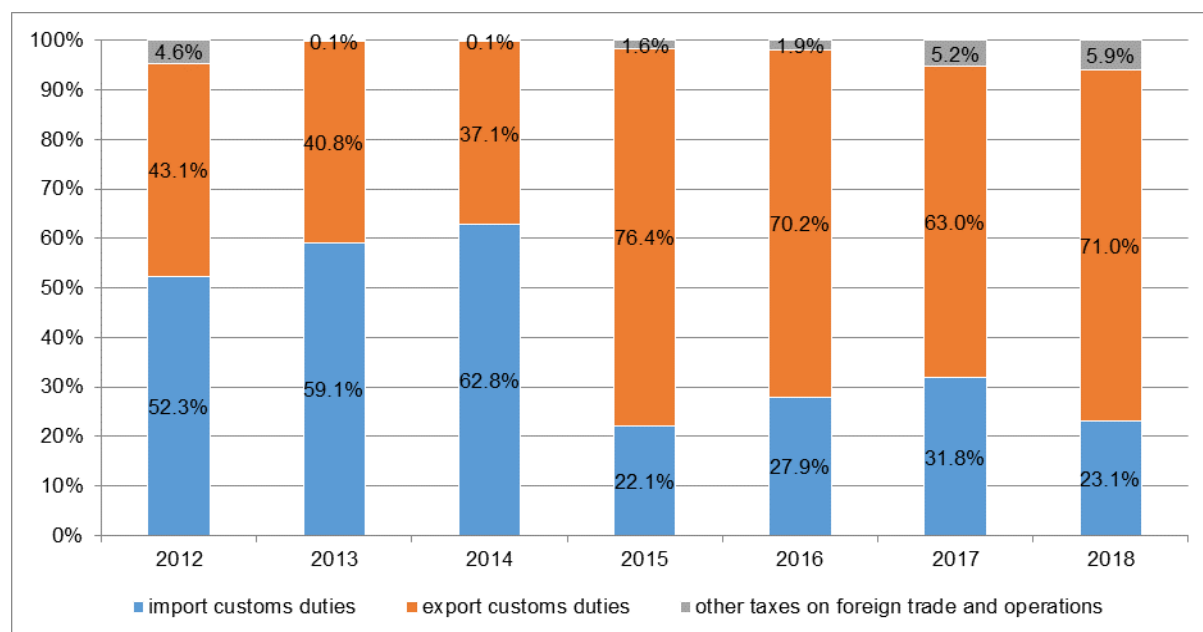


Figure 1. Structure of tax revenues of the Republic of Belarus from foreign economic activities

Source: own study based on the [2].

The structure was changed significantly during 2012-2018. More than half of revenues accounted for import customs duties from 2012 to 2014. However, there was a significant shift towards export customs duties since 2015, the share of which averaged 70%. In addition, there was an increase in the share of other taxes on foreign trade and operations from 1.6% (in 2015) to 5.9% (in 2018).

There was a decline in the share of taxes from foreign economic activities as a result of slower growth of import customs duties in 2013, and due to the abolition of export customs duties on potash fertilizers in 2014. In 2015, revenues from foreign economic activities increased due to the transfer of export customs duties from the export of petroleum products to the Republican budget and due to the resumption of export customs duties on potash fertilizers.

Import customs duties had a positive trend since 2016 (tab. 3). After significant falls in 2014-2015, import customs duties (in gross terms) reached only the level of 2014 in 2018. They increased by BYN 142.6 million (by 12.6%) in 2018 compared to 2017.

Table 3. Components of tax revenues of the Republic of Belarus from foreign economic activities

Indicators	2012	2013	2014	2015	2016	2017	2018
Import customs duties [million BYN]	1,332.2	1,378.3	1,155.7	864.4	958.9	1,129.0	1,271.6
Growth rate (to previous year) [%]	163.0	103.5	83.8	74.8	110.9	117.7	112.6
Export customs duties [million BYN]	1,098.9	952.4	684.1	2,992.4	2,408.4	2,233.1	3,908.0
Growth rate (to previous year) [%]	154.2	86.7	71.8	437.4	80.5	92.7	175.0
Other taxes on international trade and operations [million BYN]	116.4	2.1	1.7	61.8	64.5	184.5	321.9
Growth rate (to previous year) [%]	778.6	1.8	81.0	3,635.3	104.4	286.0	174.5
Tax revenues from foreign economic activities, total [million BYN]	2,547.5	2,332.8	1,841.5	3,918.6	3,431.8	3,546.6	5,501.5

Source: own study based on the [2].

Export customs duties increased significantly over 2012-2018. There was a substantial reduction in 2013-2014, but these duties increased 4.4 times in 2015. Export customs duties were slightly lower in 2016-2017 than in 2015, but the growth rate was 175% to the previous year in 2018. Tab. 4 shows the dynamics and structure of export customs duties for 2014-2018.

Table 4. Dynamics and structure of export customs duties in the Republican budget of Belarus

Indicators	2014		2015		2016		2017		2018	
	million BYN	share [%]	million BYN	share [%]	million BYN	share [%]	million BYN	share [%]	million BYN	share [%]
Export customs duties, total	684.1	100.0	2,992.4	100.0	2,408.4	100.0	2,233.1	100.0	3,908.0	100.0
including:										
export customs duties on crude oil produced in the Republic of Belarus	563.2	82.3	296.3	9.9	236.7	9.8	275.1	12.3	421.9	10.8
export customs duties on the export of petroleum products	78.7	11.5	2,002.5	66.9	1,102.3	45.8	1,310.3	58.7	2,044.3	52.3
export customs duty on potash fertilizers	39.0	5.7	689.0	23.0	1,065.2	44.2	644.6	28.9	1,440.5	36.9

Source: own study based on the [2].

There were over 82% export customs duties on crude oil produced in the Republic of Belarus in 2014, however, this type of duties averaged about 10.7% in 2015-2018. The main source of export customs duties was duties on the export of petroleum products [12], their share averaged 55.9%. The share of export customs duty on potash fertilizers increased on average to 33.2% in 2015-2018.



### 5. Conclusions

The tax revenues from foreign economic activities are the second largest replenishment source of the Republican budget of Belarus. The structure of export customs duties was changed significantly since 2015 compared to 2014. A notable dip in import customs duties occurred in 2015 compared to 2014. This is due to the Treaty on the EAEU. Import customs duties were divided into those paid and credited under The Treaty on the EAEU and those paid and credited from other non-member States of the EAEU.

The tax manoeuvre in the Russian Federation, which has begun in 2015, is a major influence on the revenues from foreign economic activities in the Republican budget of Belarus. The tax manoeuvre implies a gradual reduction of export duties on oil and oil products to 0% by 2024 [8] with a simultaneous increase in the mineral extraction tax on oil production [7]. According to the experts' estimation [4, p. 20] the total losses of the EAEU Member-States will amount to RUB 626 billion as a result of the tax manoeuvre provided in the absence of compensation payments. Moreover, the main losses (87% of the total amount) are associated with an increase in the cost of oil supplied to the refineries of Belarus.

Tax revenues from foreign economic activities in the Republican budget are planned at BYN 4,357.5 million in 2019 [17] which will be 20% less than the Republican budget actually received in 2018. In doing so, export customs duties will account for 58.6% of all tax revenues from foreign economic activities (71.0% in 2018), and import customs duties from the EAEU Member-States – 29.5% (90% of which will come from the Russian Federation).

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## **THE ROLE OF BUSINESS PERSONNEL IN IMPROVING PRODUCT QUALITY**

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**Abstract.** *Due to the relevance of the research topic, the author draws attention to the quality issues of the products manufactured today. The article gives an example of a real enterprise operating in Khmelnytskyi region, reveals the issues of improving the quality of products, as well as the organization of management staff and specialists for successful operation of the enterprise. Attention is paid to the importance and ramifications of the tasks facing the enterprise and their mandatory implementation. It is indicated that this company has a quality management system, which covers 12 processes. Each of these processes is important for the production of quality products and encourages their production to increase the quality level of products. The solution of this problem will lead to strengthening of market positions and continuous customer satisfaction on the basis of increase in consumer value of the enterprise's products.*

**Key words:** *quality, products, level, issues, enterprise.*

**JEL Classification:** L26, L84

**UDC:** 65.01:005 (477)

### **1. Introduction**

Formulation of the problem. At each stage of development of social production there are specific requirements for product quality. In the early stages of industrial development, the main requirements for quality were accuracy and durability. Quality requirements are the expression of certain needs or their translation into a set of quantitatively or qualitatively established requirements for the characteristics of the object to enable their implementation and verification. Quality indicators are quantitatively or qualitatively established specific requirements for the characteristics of the object, which allow their implementation and verification [2].

When conducting technical assessments, the definition of "quality" is used variously, namely - when comparing objects in order to identify the degree of superiority, i.e. relative quality; in quantitative statistical evaluation - the level of quality; when conducting an accurate technical assessment - a measure of quality.

### **2. Analysis of recent research and publications**

Theoretical-methodological and economic-organizational aspects of product quality assurance are reflected in the works of leading national and foreign economists: I. Ansoff, Z. S. Geiler, D.S. Demydenko, B.E. Lastovetskyi, L.A. Matveieva, V.S. Ponomarenko, V.M. Sokolenko, A. Subeto, A. Feigenbaum, Z. Yu. Khamdamov, D. Harrington and others. However, scientific and technical progress is not standing still, and the problem of quality is also in motion. Therefore, there is a constant need to adapt it to the requirements of the time. That accounts for the relevance of the chosen topic, determines its purpose and specific objectives.

### **3. Setting objectives.**

The purpose of the article is to study the issue of improving the quality of manufactured products.

#### **4. Presentation of the main results**

The internal hierarchy of quality is formed within the organization which forms the basis of the so-called quality pyramid reflecting the impact of quality on society in general [1].

Product quality and its improvement has always been a topical issue of the enterprise. The same issue has arisen since the early 1970s at the Krasyliv Aggregate Plant in the Khmelnytskyi region. At that time, the company had a comprehensive product quality management system. In 2004, the company developed and implemented a quality management system based on the "process approach", which allowed ensuring the continuity of management at the junction of individual processes within the system, as well as their combination and interaction. Who managed this process? The answer to this question was - senior management - Chairman – General Manager of the company, who formulates policies and objectives in the field of quality, provides processes with the necessary resources and is responsible for implementing quality policies and achieving short-term goals that should meet strategic goals.

The main document that regulates and establishes the policy in the field of quality at the "Krasyliv Aggregate Plant" Co is the quality manual. This document contains a complete description of the elements of the quality system and the principles of their interaction within the enterprise. This guide contains the policy formulated by the company's management in the field of quality, quality objectives, approved organizational structure of production, defines responsibilities, powers and procedures, as well as processes and resources that ensure the implementation of quality management and compliance with its requirements.

Management requirements are mandatory for all divisions of Krasyliv Aggregate Plant, and apply to processes related to the design, manufacture and sale of products, as well as the processes of setting up, operating and improving the quality system.

This document was developed and controlled by the quality department, agreed with the heads of structural units of the enterprise and chief specialists, approved by the General Manager and put into effect by order of the enterprise. The main role of quality policy is to highlight the aspirations of the company to manage the enterprise and processes on the basis of goals and principles in the field of quality, and the main task - involvement of all the company's employees in the process of quality improvement in order to ensure constant demand for the company's products.

The policy in the field of quality is promulgated with the help of factory radio in all divisions of the enterprise; its role and value are discussed and explained at the production meeting to all employees of the Krasyliv Aggregate Plant. The quality policy is open to all consumers, suppliers and other stakeholders. For this purpose, it is presented as a separate document.

The purpose of the quality policy of the Krasyliv Aggregate Plant is to strengthen market positions and continuously ensure customer satisfaction by increasing the consumer value of products.

This goal is achieved by the staff of the enterprise when solving the following tasks: development and implementation of a modern quality management system; reconstruction of foundry production with the introduction of advanced technological processes; introduction of modern control methods and measuring equipment; modernization of technological equipment in procurement and machining sections; continuous professional development of the company's staff; improving the processes and management structure of the enterprise.

The quality of the company's products necessarily begins with jobs and is continued by the heads of divisions, thus ensuring the effectiveness of the activities of the division headed by them and the involvement of each employee in the activities of the Policy.

The company's management authorizes a quality management system aimed at implementing the Quality Policy and achieving the stated goal, and the company's policy reveals the content of the function in the field of quality and ensures a stable financial situation to guarantee the competitiveness of products, well-being of its employees and shareholders.

The Krasyliv Aggregate Plant Co has established production quality management facilities at the production stage and the main provisions for production management. Senior management of the enterprise brings to the attention of the whole team the importance of satisfying the needs of the consumer, as well as regulatory and legal requirements. Quality Commissioner - The Chief Engineer is responsible for fulfilling this obligation, promoting an understanding of consumer requirements

throughout the enterprise.

Top management defines the purpose and objectives of the quality management system. They are documented and announced in the form of quality policy and quality objectives. The Chairman of the Board, namely the General Manager, periodically reviews the effectiveness of the quality management system to ensure its suitability, efficiency, and adequacy to the conditions of the enterprise.

Analysis is used to assess the current status and level of compliance with the requirements of the quality management system, on the basis of which the chairman – General Manager, initiates actions to further improve the system. Top management is required to provide the resources needed to implement and improve the quality management system.

The basis of the company's policy in the field of quality is to meet consumer demands in terms of product quality, range, volume and timing of its delivery, while ensuring the profitability of the enterprise, satisfaction of factory staff and continuous improvement of quality management system.

The Krasyliv Aggregate Plant monitors product quality levels through a grid of processes that are subject to constant analysis by senior management. The structure of this grid is quite problematic, because most processes interact with each other.

To ensure adequate process management and organization of interaction between the processes described in the stereotypes of the enterprise, certain company's employees are appointed to oversee the above operations. These company's employees are responsible for the operation, they provide unambiguous judgment for all participants in the process as to their responsibilities and rights; organize interaction in solving problems involving several functional units of the enterprise.

In general, the effective application of the quality management system based on the "process approach" is the responsibility of the quality commissioner - chief engineer, who implements the organization of process control by conducting internal tests and informs the CEO about the consequences of such tests.

The developed processes are documented in the quality manual, standards, technological processes, and technological instructions. The quality system implemented at the enterprise is aimed at broad satisfaction of demands and expectations of buyers

Therefore, special management methods are applied to the processes that directly affect the quality of products whose manufacture is outsourced to other companies (suppliers).

The company management has identified the main processes that create additional value, as well as processes that ensure the functioning of the main processes and have a direct impact on the financial and economic performance of the company and the quality of products manufactured by it. The process means the interaction of people, machines, material and procedures aimed at providing a specific service or manufacturing a specific product. The inputs to the process are usually the outputs of other processes. Processes are usually planned and implemented in a managed environment to add value. Any type of activity can be represented as a process.

Documents describing the processes used by the company contain: requirements for input data; requirements for output data; sequence of working stages and operations; data on process participants (structural subdivisions of the company); control points in the course of the process; data on the owners or managers of the process; indicators for evaluation of results of specific operations are established

Documentation of the quality management system is represented by the following types of documents: Policy and goals in the field of quality; quality manual; quality management system procedures containing description and requirements for work processes, standards and other normative documents, design documentation, technological and working instructions, consumer documentation, supplier documentation, quality reports (plans, schedules, protocols, acts, cards, invoices, journals and other quality records).

In general, the process in the company is determined by a special feature: consumer orientation. This process begins and ends with the consumer. The organizational chart corresponds to the structure in which the processes become operational.

Chairman of the Board - General Manager of the company is responsible for planning and applying the processes of monitoring, measurement, analysis and improvement at Krasyliv Aggregate Plant. Deputy Managers in the relevant areas organize the collection of objective data and evaluate the

activities of subordinate services and departments

Heads of departments monitor, measure and analyze data on the effectiveness of authorizing the quality management system in departments. Measurement and control operations are aimed at guaranteeing and verifying the conformity of the product as defined in the specifications to the agreements (contracts), technological documentation, and standards of the company.

The enterprise systematically measures and monitors compliance with the requirements of technological discipline, implementation of plans for production and marketing, procurement, compliance with labor and environmental protection requirements, use of material and financial resources and other indicators.

At production meetings, Chairman of the Board – General Manager, deputy managers, chief specialists and heads of structural units control the performance of the processes used by the company, for example: quality of supplies; quality of products made by the company; implementation of production and supply plans; work of the company on purchase and sale of the products; execution of the company and divisions' budget compliance with the requirements of labor protection, industrial sanitation; unplanned downtime of equipment, compliance with the tax payment schedules; training of company personnel; implementation of quality plans, etc. The processes of the quality management system are regularly reviewed by senior management to identify any possible failures or breakdowns, as well as opportunities for improvement.

The following processes of the quality management system exist at Krasyliv Aggregate Plant:

1. Analysis of agreements (contracts), regulated by company standards STP 7.2.1.-72 -551. Deputy Business Manager is responsible for the process. The purpose of the process is to reduce consumer risk and prevent their unreasonable requirements after delivery. Indicators for assessing the process: the ratio of the number of realized customer requests to the total number of requests received by the company; the number of changes in agreements (contracts) at the initiative of the company; consumer satisfaction data.

2. Analysis of the quality management system by senior management, regulated by STP 5.6.1. - 39 - 555. - Chairman of the Board – General Manager of the company is responsible for the process. Objectives of the process include systematic assessment of the suitability, adequacy, effectiveness, and efficiency of the QMS, taking into account quality policies and objectives. Indicators for process evaluation are effectiveness and efficiency of measures that have been developed based on the results of analysis by senior management

3. Procurement management is regulated by STP 7.4.1-58-561, STP 7.4-46-232, STP 7.4-58-155, STP 7.4-91-576. Deputy Business and Production Manager is responsible for the process. The purpose of the process is to ensure interaction with suppliers, which allows to maintain the quality of purchased products at the level of requirements proposed by «Krasyliv Aggregate Plant». Indicators for process evaluation include number of orders executed on time; number of accepted orders; number of claims on the quality of raw materials for each supplier; ensured compliance of purchased products during storage in warehouses.

4. Management of financial resources is regulated by STP 6.1-60-101. Deputy Business Manager is responsible for the process. The purpose of the process is to provide the economic activity of the plant with financial resources. A comprehensive indicator for measuring the process, which includes: the state and use of own working capital; condition and use of credit funds; observance of financial discipline by each structural subdivision and the company as a whole.

5. Planning and production are regulated by STP 7.5-61-450, STP 6.1-59-165, STP 7.5.1-63-574. Deputy Production Manager is responsible for the process. The purpose of the process includes fulfillment of orders within the terms stipulated by agreements (contracts). Indicators for measuring the process: implementation of the production plan in terms of volume, range and timing; the percentage of non-compliant products in total output; load factors of technological equipment; unscheduled downtime of equipment; fulfillment of product shipment terms; volumes of work in progress; losses due to complaints

6. Monitoring and control of technological processes and products are regulated by STP 8.2-45-373, STP 8.3-45-374, STP 8.2-80-520. Chief engineer, deputy quality manager - head of technical



control department is responsible for the process. The purpose of the process is to obtain objective data on the implementation of the established requirements for technological processes and products. Indicators for measuring the process include the number of violations of technological discipline; the number of claims and customer complaints.

7. Metrological support is regulated by STP 7.6-48-134, STP 7.3-48-478, STP 7.6-47-191, STP 7.6-48-256. Head of production control laboratory is responsible for the process. The purpose of the process is to ensure the suitability of measuring and testing instruments for measuring the quality of processes and products. Indicators for measuring the process include the number of cases of absence of the necessary SIT in production; the degree of compliance with the schedule of inspection, calibration; the number of cases of use of unsuitable SIT in production.

8. Delivery of products to the customer is regulated by STP 7.2-94-167 Technological instructions. Head of the financial and sales department, heads of shops ARE Responsible for the process. The purpose of the process is timely delivery of products to the customer, preservation of product quality achieved in the manufacture and in the process of its transportation. Indicators for measuring the process include compliance with agreements (contracts) for the supply of products by product list, completeness, quality, availability of shipping documentation; no storage violations of finished products (identification, handling of products, condition of packaging, storage and protection against damage); timely consideration of claims and prompt application of measures to rectify them.

9. Consumer satisfaction assessment is regulated by STP 8.2.1-49-558, STP 8.4-75-455. Deputy Business Manager is responsible for the process. The purpose of the process is to increase the number of customers. Indicators for measuring the process include the number of claims, consumer complaints; dynamics of the number of consumers working with the enterprise: 2 years, 3 years, 5 years and over 5 years; dynamics of supply volumes; the number of requests received by the company.

10. Maintenance and repair of equipment is regulated by STP 6.3-57-168, STP 6.3-57-568, STP 7.5-57-578. Deputy Chief Engineer for Equipment and Technical Re-equipment is responsible for the process. The purpose of the process is to ensure the efficiency and suitability of technological equipment for the manufacture of products that meet the established requirements. Indicators for measuring the process include implementation of the maintenance and repair plan: a) on time; b) by duration; the number of equipment failures in the repair period; timeliness of drawing up and execution of the schedule of periodic check of the equipment for technological accuracy.

11. Staff training is regulated by STP 6.2.2-67-554. Deputy Personnel, Regime and Social Affairs Manager is responsible for the process. The purpose of the process is to provide support and development of staff competence in accordance with the needs of the company. Indicators for measuring the process include data on the implementation of plans, training schedules; evaluation of training effectiveness; the number of employees studying by category, type of educational institution and mode of study.

12. Internal audit is regulated by STP 8.2.2-39-549. Chief engineer, quality commissioner is responsible for the process. The purpose of the process is to establish compliance of all operations of the plant with the policy and objectives in the field of quality, as well as the requirements of the documentation. Indicators for measuring the process include the number of detected deviations; the effectiveness of measures to eliminate deviations identified during internal audits; providing the possibility of conducting an analysis of the quality management system by senior management on the basis of data obtained during internal audits.

The quality system gives each employee freedom of action, as well as defines the powers and responsibilities within the requirements set out in job descriptions and in the regulations for structural units. Chairman of the Board – General Manager of Krasyliv Aggregate Plant designs the company's development strategy, the concept of maximum return on investment and the company's policy in the field of quality management, he is responsible for its implementation and ensuring the functioning of the quality system with the necessary resources. He is responsible for the results of all operations of the company.

Quality Commissioner - Chief Engineer manages the technical support of production activities of "Krasyliv Aggregate Plant", he is responsible for developing plans to improve the quality of products,

organization of scientific, design and technological support of production to achieve and maintain the required contract product quality. He also manages the development and implementation of measures for the introduction of quality management system, standards and indicators governing product quality. Manages the work on the development and improvement of the quality system of "Krasyliv Aggregate Plant", provides internal audits of the quality management system in the company .

He has the authority and is responsible for the following tasks: implementation, support and continuous improvement of the quality management system; providing operational information to the Chairman of the Board – General Manager of Krasyliv Aggregate Plant on the functioning of the quality system in order to assess its effectiveness and take corrective action; ensuring understanding of consumer requirements at all levels of enterprise management; coordination of relations with external organizations on issues related to the quality of products and services.

All heads of structural units are to some extent responsible for product quality, so deputy quality manager (head of technical control department) is responsible for the organization, condition and improvement of technical control in the company, correct and timely execution of documents certifying compliance with updated rules; conducting incoming control of purchased products.

He provides operational control throughout all stages of the production process, quality control and completeness of finished products, etc.. The duties of Deputy Production Manager include managing the activities of the company for the operational regulation of production, ensuring the rhythm of production, providing production with technical documentation, equipment, tools, materials, components, transport, loading and unloading means and is responsible for the implementation of the production program and product quality.

Deputy Quality Manager - Head of the Technical Control Department has the authority to interact with consumers to consider their proposals, complaints and claims. Head of the legal service has the authority to legally ensure interaction with consumers. The study of consumer requirements includes all aspects related to products and related services that may affect the satisfaction of consumer requirements and expectations.

The study of consumer requirements includes all aspects related to products and corresponding services that may affect the satisfaction of consumer requirements and expectations. The needs and expectations of the consumer are determined and checked in the process of order analysis, installation, service work and author's supervision. Information on consumer needs and expectations is analyzed and prepared from various sources: consumer research and direct contacts with consumers in the process of studying agreements (contracts); consumer research and direct contacts with consumers in the process of exhibitions and other forms of advertising.

These sources include the following data: consumer requirements stated in agreements (contracts); consumer complaints and claims; consumer feedback on the company's website; reports on the results provided by chief of installation and chief of adjustment section, welding works at installation of machines and equipment, works related to reconstruction and modernization of machines and equipment in order to extend their service life; reports on service of machines and equipment covered by warranty and in the post-warranty periods; reports on the author's supervision submitted during the performance of chief of installation and service work. Collection and analysis of information on the degree of consumer satisfaction is carried out in accordance with STP 8.2.1-49-558 "Identification of consumer satisfaction".

## **5. Conclusions**

Thus, at the presented company work on the maintenance of production quality level by all employees headed by the top management is in place . The company's staff constantly monitors the weak points of product quality and makes adjustments to the relevant documentation, which, accordingly, leads to a positive effect.

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**ANALYSIS OF FINANCIAL AND ECONOMIC SUSTAINABILITY OF  
ENTERPRISES BASED ON THE USE OF ACCOUNTING AND ANALYTICAL  
INSTRUMENTS**

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**Abstract.** *Analysis of financial stability is part of the analysis of the financial condition of the company. Financial stability determines the long-term solvency of the enterprise. The problems of financial stability analysis are caused by the features of financial statements, different approaches to the concept of "capital", contradictions in the interests of internal managers and external lenders, which affect the interpretation of indicators. The article investigates and develops methodological approaches to ensure the financial and economic stability of enterprises based on the use of accounting and analytical tools. Theoretical provisions and practical recommendations for increasing the financial and economic stability of PJSC "Zaporizhstal" to ensure its competitive advantages are substantiated.*

**Key words:** bank, financial stability, competitiveness, indicators, profitability, liquidity

**JEL Classification:** O012, O021, O022

**UDK 334.72:336.7:338.2**

## **1. Introduction**

With the transition to a market economy, the range of problems related to the sustainability of enterprises has expanded. There are many different types of enterprises that differ in scale, management structure. The conditions of a market economy presuppose the existence of competition, through the mechanism of which there is a strict selection of the most stable and promising enterprises that have the ability to function effectively and strengthen their market position. The company is required to increase production efficiency, product competitiveness through the introduction of scientific and technological progress, effective forms of management and production management. An important role in the implementation of this task is given to the analysis of economic activity of enterprises, research and management of their financial and economic stability.

## **2. Analysis of recent researches and publications**

Theoretical foundations and practical methods of ensuring the financial stability of enterprises are reflected in the works of many domestic and foreign scientists, in particular: E. Altman, M.S. Abryutina, I.O. Blanca, W.H. Beaver, I.T. Balabanova, O.I. Baranovsky, F.F. Butynets, M.I. Bakanova, L. Bernstein, M.D. Bilyk, O.G. White, O.M. Volkova, T.V. Golovko, A. Gropeli, I.S. Drobot, V.A. Dubrova, O.R. Kvasovsky, V.V. Kostetskoho, O.V. Kneisler, A.P. Kovaleva, A.I. Kovalchuk, M.Y. Korobova, R. Lysa, L.A. Lakhtionova, E.V. Pavlovskaya, N.O. Rusak, G.V. Savitskaya, V.K. Savchuk, R.S. Stoyanova, N. Holt, A.V. Chupisa, V.V. Chepurko, A.D. Sheremet and other scientists.

However, many issues related to ensuring the financial and economic stability of enterprises remain unexplored and debatable, both in theoretical and applied aspects.

### **3. The main objective.**

Development of methodological approaches to ensure the financial and economic stability of enterprises based on the use of accounting and analytical tools.

### **4. Research results**

At the present stage of transformation of society, when the share of human capital in the total national wealth of the country grows, and the development of enterprises becomes possible only with the creation of new knowledge and production of high-tech products with high consumer qualities, the issue of financial stability becomes the main condition for innovation. The strategy of enterprise development in the era of cognitive economy requires significant long-term investments, which in the absence of financial stability of the enterprise becomes unrealistic. In the conditions of crisis phenomena the long-term solvency of the enterprise directly depends on financial stability.

The development of a financial strategy to ensure the financial stability of the enterprise should be associated with the formation of strategic financial goals, which are determined taking into account the threats of loss of financial stability of the enterprise and ways to prevent them.

The formation of a strategy to ensure the financial stability of the enterprise should be based on corporate development strategies to improve capital management and cash flow in the long run. Decisive is the main strategy, the focus of which affects the content of steady state management functions.

Given the life cycle of enterprises, the strategy of financial stability and the method of its implementation should be such that the enterprise could at each point of maturity have a new stage of emergence of competitive advantages. Therefore, at present, special techniques are used to develop the financial strategy of the enterprise.

Approbation of the main ones was carried out by us according to PJSC "Zaporizhstal" in order to establish the possibility of their application to develop a strategy to ensure the financial stability of enterprises:

1. Matrix of financial strategies of J. Franchon and I. Romane.
2. Matrix of financial strategies, which is formed on the basis of economic value added and internal and sustainable growth rates of the enterprise.

The matrix of financial strategies of J. Franchon and I. Romane is based on the calculation of three coefficients:

- the result of economic activity;
- the result of financial activities; the result of financial and economic activities.

The matrix helps to predict the "critical path" of the enterprise for the future, to outline the allowable limits of financial risk and to identify the threshold of the enterprise.

Squares 1, 2 and 3 are the equilibrium zone. Above the diagonal (squares 4, 5, 6) is the zone of success, in which the values of indicators are positive and there is a creation of liquidity.

Net cash flow is consistently positive, financial risk is minimal. Under the diagonal (squares 7, 8, 9) is the deficit zone, it is the consumption of liquidity and the values of the indicators are negative.

Consider the possible provisions of the enterprise on the matrix of financial strategy and possible ways to change them.

- ✓ Square 1. The father of the family. The growth rate of turnover is lower than possible. There are reserves. The transition to squares 4, 2 and 7 is possible.
- ✓ Square 2. Stable equilibrium. In this situation, the company is in a state of financial equilibrium and has the largest number of possible options for changing the financial situation: squares 1, 4, 7, 5, 3, 8.
- ✓ Square 3. Unstable equilibrium. The situation is characterized by the lack of own free funds and the use of attracted capital. The situation can be observed after the implementation of the investment project. Possible ways out 8, 2 and 5.
- ✓ Square 4. Rentier. Availability of free funds for projects using borrowed capital. Go to squares 1, 2, 7.
- ✓ Square 5. Attack. Excess own funds allows you to expand your market segment. Go to 2 and 6.

- ✓ Square 6. Maternal society. Excess liquid funds. The company has the ability to create and fund subsidiaries, moving to 4 or 5.
- ✓ Square 7. Episodic deficit. Deficit of liquid funds due to mismatch of terms of receipt and expenditure of funds. Go to 1, 2, 8.
- ✓ Square 8. Dilemma. There is a shortage of liquidity, which is partially covered by borrowing. Go to 2, 7, 9.
- ✓ Square 9. Crisis. Crisis state of the enterprise. The need to reduce all investments or break up the company. The need for financial support. It is possible to go to 8 or 7.

However, it is necessary to note the negative trends that may create difficulties in the future. PJSC "Zaporizhstal" significantly lacks its own working capital. Depreciation of fixed assets may soon cross the critical line and put the company in front of the problem of survival. Thus, the current financial condition of the enterprise conceals various actions of financial risks.

The result of financial and economic activities of PJSC "Zaporizhstal" in 2018 was positive, so it falls into the area of the diagonal - the zone of rejection of borrowed resources.

This situation is typical for the first square of the matrix of the strategy to ensure the financial stability of the enterprise (Figure 1).

	RFD « 0	RFD ≈ 0	RFD » 0
RGD » 0	Square 1 «Father of the family»	Square 4 «Rentier»	Square 6 «Maternal society»
RGD ≈ 0	Square 7 «Episodic deficit»	Square 2 «Stable balance»	Square 5 «Attack»
RGD « 0	Square 9 «Crisis»	Square 8 «Dilemma»	Square 3 «Unstable balance»

Figure 1: Matrix of strategy for ensuring financial and economic stability of PJSC "Zaporizhstal"

This provision is called "Father of the family". The growth rate of turnover is lower than possible. There are reserves. It is possible to move to squares 4, 2 and 7. The company is at the stage of "slowing down" the development of financial and economic activities. Since the company is at the stage of inhibiting the development of financial and economic activities, the priority area of such development, which ensures the implementation of the financial strategy is the formation of a sufficient level of financial security of the enterprise.

In order to improve the financial condition of PJSC "Zaporizhstal", it is necessary to pay attention to the management of receivables and payables (Table 1).

Table 1: Measures aimed at increasing the financial stability of PJSC «Zaporizhstal»

Activities	Directions
1. Strengthening control and analysis of receivables	Development of an effective method of providing commercial credit to customers and collection of funds
2. Factoring operations	Acceleration of turnover and collection of receivables
3. Spontaneous financing	Encouraging customers to speed up payment for their services, attracting new customers
4. Creating a reserve for doubtful debts	Preventing losses due to financial difficulties for customers
5. Making short-term financial investments at the expense of retained earnings	Getting extra income

To exit the enterprise from square 1 and move to a position, for example, square 2 "Stable equilibrium" or square 4 "Rentier", the following measures can be recommended:

1. Further reduction of receivables. To this end, the following should be done:



- tighter control over the state of settlements with buyers on overdue (overdue) debts;
  - if possible, focus on a larger number of buyers to reduce the risk of non-payment by one or more buyers;
  - monitor the ratio of receivables and payables, as the excess of accounts payable over receivables leads to insolvency of the enterprise;
2. Increasing the company's own funds by attracting investment.
  3. Review the structure of financial management, which can give a more efficient use of financial resources.
  4. Restore fixed assets.
  5. Plan your activities and make a profit from it.
  6. Pay attention to the increase in short-term liabilities, as this may lead to a decrease in financing and reliability to creditors, which can lead to bankruptcy.

The use of this matrix allows the company to adequately make decisions on the integrated use of all financial resources aimed at achieving the goals of financial strategy. Within the proposed matrix, we can consider the problem of the ratio of goals and resources of enterprise development in dynamics, providing the opportunity to formulate financial strategy, priority areas of development, ensuring its implementation and modifying financial strategy by changing important parameters of enterprise operation.

The EVA indicator is very important in the process of finding ways to ensure the financial stability of the enterprise, because if EVA grows from year to year, the owner experiences an increase and increase in capital. If the growth rate of EVA begins to fall, it should cause concern to the owner. If EVA has become negative, you need to look for ways to correct the situation.

The calculated indicators show that PJSC "Zaporizhstal" during 2017-2018 in the matrix of financial strategies occupied the lower left square, which is characterized by the destruction of the value of the enterprise in the presence of excess cash. At the same time, 2017 is characterized by a change in the position of the company in the matrix in the upper left square, which is characterized by moderate development of the company, which allows the company to increase and maintain growth rates from its own resources.

Thus, from the standpoint of ensuring the financial development of the enterprise, the most desirable is the transition to square 4 according to the matrix of financial strategies of J. Franchon and I. Romane, which is characterized by an increase in production.

Based on the above, PJSC "Zaporizhstal" can recommend a strategy of gradual development, which is typical for most companies. This type of strategy involves directing the business entity to gradually increase the volume of activity, increase profitability and improve its basic financial and production-economic indicators and characteristics, ensuring a stable financial position (Figure 2).

1. Use excess funds for accelerated growth. 2. Implementation of new projects, purchase of existing enterprises. 3. Direct the excess funds to pay the owners.	Creation cost $EVA > 0$	1. Reduce income deductions. 2. Attract additional capital: issue of shares, obtaining loans. 3. Reduce the growth rate.
Excess cash < SGR		Cash shortage > SGR
1. Distribute part of the money, the rest to direct to increase profitability. 2. Review the structure of capital, reduce its value. 3. If the measures taken do not work, go out of business.	Destruction cost $EVA < 0$	1. Change the strategy, restructure the business. 2. Reengineer all business processes. 3. If the measures taken do not work, go out of business.

Figure 2: Matrix of financial strategies and growth rate of PJSC "Zaporizhstal"

As a result of the analysis of the financial stability of the enterprise, it was found that the stability of the enterprise in 2018 was normal, and during 2017 it was in crisis. At the same time, negative trends were also identified, leading to a further weakening of financial stability.

Analysis and management of receivables involves control over the turnover of funds in the calculations. Accelerating the turnover of funds in the dynamics is seen as a positive trend. The general scheme of control over receivables, as a rule, includes several stages:

Stage 1. The critical level of receivables is set; all settlement documents related to debts exceeding the critical level are subject to mandatory verification.

Stage 2. From the settlement documents the control sample is carried out.

Stage 3. The reality of the amounts of receivables in the selected documents is checked. In particular, letters may be sent to contractors with a request to confirm the reality of the amount stated in the document.

One of the key problems of the company today is the problem of cash deficit, ie highly liquid assets. This is due to the active provision of commercial credit to customers and the lack of strict control over the collection of commercial loans.

The company has significant internal reserves and mechanisms that allow you to manage receivables more efficiently and obtain additional working capital. To effectively manage receivables, the company must follow the following recommendations:

- 1) control the status of settlements with customers and timely file claims;
- 2) focus on as many customers as possible in order to reduce the risk of non-payment by one or more large consumers;
- 3) monitor the compliance of accounts payable and receivable.

The main directions of the policy of accelerating and increasing the efficiency of settlements are the use of factoring operations and spontaneous financing [2, p. 32; 31, c. 21].

Table 2 presents the conditions for providing factoring services by the servicing bank for PJSC "Zaporizhstal".

Table 2: Bank tariffs for factoring services

Service	Tariff
Factoring financing, %	19
Accounts receivable management, %	0
Document processing, %	1,5

It is expected that in the forecast year there will be an increase in sales of 33% due to the expansion of the market, attracting new customers on a regular basis and expanding the range of products.

In the table 3 calculate the limit of financing, costs and the formation of additional income when using the factoring of PJSC "Zaporizhstal" in the forecast period.

Table 3: Analysis of the effectiveness of the use of factoring "Zaporizhstal" in the forecast period

Indicator	Result
Average monthly trade turnover, thousand UAH	22970,0
Deferred payment under the contract for services, days	15
Total funding limit, thousand UAH	11480,0
Amount of funding, %	90
Factoring financing, %	1,584
Factoring commission, thousand UAH	2450,0
Document processing fee, %	0,125
Document processing fee, thousand UAH	19,0
Total factoring costs, thousand UAH	2470,0
Profitability of sales, %	2,63
The ratio of gross profit to cost, %	0,23
Additional income for 15 days, thousand UAH	170,0
Additional income for the year, thousand UAH	4250,0

As can be seen from table 3, the annual income from the use of factoring less costs for its implementation will be 4250.0 thousand UAH, which confirms the effectiveness of its use in the studied enterprise.

Due to the use of factoring, the average annual receivables for products, goods, works, services will decrease by 1268.0 thousand. UAH, the number of turnovers made by it for the year will increase by 2453.0, and the repayment period will be reduced to 1 day.

Solving the problem of reducing receivables for products, goods, works, services requires a flexible combination of both strict measures to collect it, and methods of incentives for regular customers. In practice, for such a combination, the method of spontaneous financing is used - providing discounts to buyers for reducing payment terms. Spontaneous financing is beneficial for both the supplier and the buyer. Moreover, it allows you to get some indirect benefits: improves the liquidity of the balance sheet and all financial and economic performance indicators of the enterprise; a positive image of the company that cares about its customers is formed; spontaneous financing, as a method of financial management, helps to reduce receivables.

### **5. Conclusions**

Strategic management of financial stability should take into account not only the type of financial policy, but also the type of financial stability that is characteristic of the company at a given time. Areas of ensuring financial stability tactical accounting and analytical tools include the choice of target structure of working capital financing, establishing principles for optimizing cost management policy (reasonableness, minimization, planning), which allows to clarify measures to achieve the target financial stability of enterprises.

Determining the position of the enterprise using the matrix of financial strategies of J. Franchon and I. Romane and the matrix of financial strategies formed on the basis of EVA and internal and sustainable growth of the enterprise, we came to the conclusion that the company can recommend a strategy of gradual development. The financial aspect of such a strategy is to determine the optimal level of the ratio of borrowed and own funds, increase the level of profitability of products by reducing its cost, increasing the turnover of working capital and more.

It is recommended to apply the method of spontaneous financing to clients with relatively small receivables. Sales of products to these customers are periodic, irregular, so the best incentive to speed up payments for them will be to provide discounts for bills before the critical deadline. It will also be one of the ways for the company to attract customers to work on a regular basis.

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**WAYS TO INTRODUCE INNOVATIVE FORMS  
EURO-REGIONAL COOPERATION BETWEEN UKRAINE AND THE COUNTRIES  
OF THE EUROPEAN UNION**

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**Annotation.** *Innovative cooperation at the present stage contributes to and will continue to contribute to the modernization of the Euroregions and bring them to a new technological level. But this requires attracting significant investment resources, without which the latest technologies cannot be implemented. In addition, the innovative model of Euro-regional cooperation concerns the development of political and cultural ties between countries, the expansion of human contacts. The implementation of these tasks provides that the innovative model of cooperation will help transform border territories into integrated, mutually complementary areas with a high level of socio-economic development and improve the quality of life of citizens of the countries involved in such cooperation.*

**Keyword:** *European Union, innovation, integration, Euroregion, cross-border cooperation.*

**JEL Classification:** R11, R12

**UDC:** 330.341.1:332.1+339.92

**1. Introduction.**

In the context of globalization and European integration processes facing the regions of Ukraine, there are challenges for the intensive development of new methods and techniques of management, the use of innovative mechanisms and tools to stimulate the socio-economic development of territories that have proven themselves in the world practice. All this makes it necessary to search for innovative approaches to the formation of new effective strategies for Euro-regional development. Formation and use of innovative potential of Euro-regional development is one of the conditions for effective solution of social and economic problems, optimal use of resources available at the local level, use of the potential of the internal market, activation of business and public initiatives, introduction of effective mechanisms and tools to stimulate regional development.

Despite some positive dynamics in the development of Euro-regional activities between Ukraine and the European Union (EU), problematic aspects of cooperation today are: difficulties in implementing projects by local communities through inconsistency in the system of public administration of Euro-regional cooperation and limited financial support, organizational and institutional obstacles to the implementation of regional and local development and European integration programs, insufficient testing of innovative forms of cooperation, lack of qualified specialists for project preparation, lack of effective joint development strategies between Ukraine and the EU member States related to regional and local strategic program documents, asymmetries in the development of road transport, transport and logistics, trade and logistics and border infrastructure of the border regions of Ukraine and the EU.

The implementation of Euro-regional cooperation projects depends to a large extent on the decisions taken in the center. A small amount of authority of regional and local authorities and local self-government of Ukraine actually deprives the regions of organizational and financial resources to solve problems and challenges, including in the field of international cooperation, and does not allow

Ukrainian regions to develop Euro - regional and cross-border cooperation at the level of local communities in full and in accordance with the capabilities of foreign partners.

These types of cooperation contribute to attracting financial resources from EU structural funds for the implementation of joint projects of border adjacent regions in the South-West of **Ukraine**. The key principle is to provide financial support for cross-border business initiatives in the form of clusters, industrial parks and further infrastructure development.

## **2. Analysis of recent researches and publications**

A number of scientific works by P. Belenky, I. Budnikevich, Z. Varnalia, M. Dolishnego, M. Kizim, L. Kovalskaya, V. Luchik, S. Shultz, and others are devoted to the peculiarities of organizing and implementing innovative activities in the field of Euro-regional cooperation, identifying problems and analyzing factors that hinder the development of innovation in this area. It can be argued that on the basis of these works, today there is a formation of a scientific direction that studies the transformation of socio-economic relations, forms and types of entrepreneurship, and new ways to manage these processes. Since the methodological basis in this direction is in the process of formation, this causes the need for a deep scientific development of this issue. In this context, the least developed aspects are the definition of specific forms, mechanisms and features of Euro-regional development in terms of reflecting the national, sectoral and geographical specifics of the regions involved in such forms of cooperation.

## **3. Purpose of the article.**

The main purpose of the article is to identify ways to introduce innovative forms of Euro-regional cooperation between Ukraine and the countries of the European Union.

## **4. Research results.**

The development of innovative forms of cross-border cooperation leads to a common Euro-regional market, which is a system of interaction of subjects of international economic relations at the regional level, in the context of which there is an economic exchange and joint use of material, financial and human resources within a particular Euroregion. At the same time, the presence of borders is offset by the construction of structures of the organization of economic space, the potential of which is much higher due to the need for effective use of new factors of production: knowledge, information and innovative technologies. This determines the economic potential of the Euroregion's resources and its possible impact on more General integration processes within a particular Euroregion. For this purpose, a flexible specialization and adaptability to innovation should be formed, which will determine the competitiveness of the Euroregion. The implementation of the strategy of Euro-regional cooperation in the conditions of effective markets can, in our opinion, reduce the impact of factors that form global instability and transnational threats, which is reflected in table 1.

This also applies to institutional challenges caused by the current instability in the world energy markets as a result of the deal OPEC+ and pandemic COVID-19 (which involves conducting qualitatively new systemic interdisciplinary research). As shown by the COVID-19 pandemic, many state institutions, not to mention inter-territorial institutions, were not prepared for such a scenario, which led to the closure of borders and the curtailment of Euro-regional activities during the pandemic, which resulted in significant losses to the parties.

Table 1. Transnational threats and possible solutions in the context of Euro-regional development

Threats	Ways of solution
Lack of development of Euroregional cooperation institutions	The decision of the general Euroregional problems through joint efforts in the region
Low level of involvement of business structures, non-governmental institutions and public organizations in Euroregional cooperation	Implementation of grant and investment policies from both Ukraine and the EU
Lack of a systematic and long-term approach to organizing Euro-regional cooperation	Development of a network of Euro-regional cooperation that ensures development in various spheres of society

While the EU's main focus is on stimulating innovative forms of economic activity in order to increase the competitiveness of border territories in the process of deepening the international division of labor, the Ukrainian side in modern conditions focuses mainly on solving current social problems and removing local barriers to the cross-border movement of goods and services. As a result, the level of innovative development of production, transport and logistics, marketing, information and communication and engineering infrastructure in the border regions of Poland, Slovakia and Hungary bordering Ukraine is significantly higher than in the border regions of Ukraine. This not only limits the potential for cross-border convergence, but also causes the spread of divergent processes, both in the market and economic, as well as in the socio-psychological and socio-political planes [1]. The latter is not given sufficient attention, which largely causes the effect of rejecting the idea of cross-border cooperation itself.

Globalization as an objective process is developing, including through regional integration. In this regard, there is a need to ensure the security not so much of national economies as of regional unions that are undergoing a process of joint adaptation. The analysis of the structure of international relations shows that within the borders of regional associations of States, international regional security institutions are being formed, the material basis of which is an economic subsystem.

The integration model of cross-border regionalism can provide an answer to the question of prospects for Ukraine's membership in the EU, which is considered as the main goal of these international relations. Given the lack of consensus on Ukraine's membership in the EU and the existence of a number of reasons that do not contribute to solving this issue in the short term, Ukraine now faces the task of forming a model of cooperation with the EU that would facilitate further movement Ukraine belongs to this most advanced international integration Association to date .

However, despite this, in Ukraine, due to the imperfect legal framework and information support, such innovative forms of Euro-regional cooperation as Euro-regional clusters, cross-border industrial parks and associations of Euro-regional cooperation are poorly applied.

Analyzing the mechanisms of influence of the main components of institutional support on the spread of innovation processes in the Euroregions between Ukraine and the EU, priority attention should be focused on the activities of institutions aimed at deepening cross-border cooperation between the neighboring border territories of Ukraine and neighboring EU member States. Unfortunately, the effectiveness of these institutions is still quite low, and the quality of the tasks assigned to them does not meet the requirements of the time.

It should be noted that, despite certain positive changes that have taken place in the institutional and legal framework for cross-border cooperation between Ukraine and the EU in recent years, the problems of Euro-regional cooperation between Ukraine and the EU member States remain relevant.

Therefore, financial support for cooperation should be considered as a tool that, when attracting a relatively small part of its own funds, makes it possible to attract external financial resources and obtain a significant socio-economic effect in the border region. However, financial support for joint projects on cross-border cooperation from the government and local authorities in Ukraine is very weak due to the inefficient mechanism of centralized formation of financial and budgetary support for cooperation. Often the relevance of applications is lost until the actual funding is received.

Economic prerequisites for effective use of such forms of Euroregional cooperation in the border area of Ukraine with the EU is advantageous geopolitical location of Ukraine at the intersection of the Eurasian transport and trade routes; demand, development and introduction of new technologies from scratch; the availability of skilled manpower and high unemployment in the border regions; the possibility of attracting additional EU funds for infrastructure development.

Constraints to the development of innovative forms of Euro-regional cooperation in Ukraine include: lack of investment and innovation mechanisms (targeted financing, direct financial assistance, subventions, etc.); imperfect legal and institutional support for the formation and functioning of new forms of cooperation; lack of partnership skills and orientation of domestic enterprises in international commodity and financial markets; low level of awareness of participants; imperfect business climate [3]. There is also a lack of research on the interaction of national business cultures of countries that are entering (may enter) into Euro-regional cooperation; in this context, only a few developments have been made in Ukrainian economic science [4].



In our opinion, it would be appropriate to develop and implement a system of the following measures to solve the identified problems.

1. Formation of a system of economic (tax, credit, customs, etc.) incentives for the implementation of innovative activities by business entities, in particular this includes activities related to the use of intellectual property rights.

2. Identification of "traps" between the links of the innovation process, building a branched and balanced innovation infrastructure to eliminate them.

3. Improvement of mechanisms of interaction and communication between participants of the innovation process, support and promotion of new organizational forms of their cooperation.

4. Provision of human resources, including talented specialists of scientific and educational organizations, industrial and small innovative enterprises, development of the system of professional training and retraining of personnel for the innovation sphere.

5. Strengthening the innovative potential of small innovative-active enterprises and their integration into the European system of scientific and production cooperation.

All this makes the formation and implementation of cross-border cooperation policy relevant as an instrument of international cooperation strategy. The implementation of this task produces a number of extremely necessary measures to establish communication links between different segments of cross-border cooperation; adopt and implement joint strategic documents on the development of cross-border cooperation; create an institutional environment for the development of cross-border clusters and implement a National Strategy for the formation and maintenance of cross-border clusters; development Of a program for the development of border trade; improving the functioning of border infrastructure.

## **5. Conclusions**

At the moment, the Ukrainian regions are characterized by the following situation: first, widespread improvement of the institutional environment in the regions is unlikely, the regional authorities have almost no incentives for this and continue to hope for state support or artificial institutional advantages in the form of special zones and other regimes; second, numerous examples show that the role of institutions as incentives for development is still secondary, the advantages of resource provision, favorable geographical location and agglomeration remain more significant.

The experience of developed countries shows that the introduction of impact mechanisms aimed at strengthening the scientific component of higher education, including the development of University science, can provide fundamentally new incentives for regional development. A significant expansion of the powers and economic opportunities of local governments in creating regional innovative forms of territorial organization of productive forces will allow them to actively influence the innovation capacity of regions through economic levers in order to gradually enter the innovation trajectory of development. The best way to develop the innovation component of the country's economy is to create a network of technoparks and territorial centers ("policies") that help attract private businesses to Finance research and development and introduce new technologies into production. Innovation activities should be based on the effective use of intellectual and industrial potential of the regions, promote the commercialization of knowledge and technology, and, accordingly, the formation of an innovative infrastructure that would act as the main source of introduction of high technologies in the production and commercial process.

**The prospects for further research** in this area are due to the fact that for a country that sets itself the goal of ensuring economic growth, the use of the existing innovative potential of the regions is of particular importance. The solution of this problem requires the activation of scientific research on issues related to improving the quality of use of innovative potential, primarily in border regions.

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## **ANALYSIS OF ECONOMIC GROWTH OF INDUSTRIAL PRODUCTION IN UKRAINE AND PROBLEMS OF ITS SUPPORT**

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**Abstrac.** *The author of the article substantiates that the formation of a modern economy involves achieving sustainable economic growth. Given the exceptional role of industry in the economy of Ukraine and the negative trends of its development in recent years, the scientific problem solved in this study is statistical and economic analysis of all sectors of industrial production in order to clarify their condition and make recommendations to increase competitiveness. Thus, this study further developed the economic analysis of the dynamics of industries based on the methods of general theory of statistics and financial mathematics, which in contrast to existing allows for cross-sectoral comparisons to determine competitiveness factors and centers of economic growth.*

**Key Words:** *economic growth, industrial production, indices of industrial production, social production.*

**JEL Classification:** O011, O014, O019, O020

**UDK 338.2 (477)**

### **1. Introduction**

The formation of a modern economy involves achieving sustainable economic growth. Stimulating economic growth, maintaining its pace at a stable and optimal level is one of the most important long-term goals of economic policy of the government of any country in recent decades. The negative factors that exist in Ukraine today - deep disparities, reduced production, inflation and unemployment, declining living standards, etc. - significantly delay the formation of an effective economic system and its ability to self-regulate. In this context, finding sources of economic growth and accelerating it becomes a priority.

### **2. Analysis of recent researches and publications**

The constant scientific interest in the problem of ensuring the competitiveness of industries is caused by their significant impact on the economy of Ukraine as a whole. Attention to this issue in their work was paid by such domestic scientists as: Ivanov Y.B., Kyzym M.O., Klimenko Y.L., Matyushenko I.Y., Obolentseva L.V., Pushkarchuk I.M., Romusik Y.B and others [1-5]. Thus, according to 2013-2018, the share of industrial production in total output changed from 48,7% to 45,1%. However, despite its reduction by – 3,6%, industrial enterprises today continue to play a crucial role in the economic development of the state.

### **3. The main objectives.**

Given the exceptional role of industry in the economy of Ukraine and the negative trends of its development in recent years, a scientific problem that needs to be addressed in this study is a statistical and economic analysis of the dynamics of all sectors of industrial production to clarify their condition and make recommendations to increase competitiveness.

#### 4. Research results

The methods of the general theory of statistics were used to study the structure of the studied phenomenon and the analysis of time series, as well as financial mathematics to eliminate the inflation factor while bringing the cost indicators to the level of the base year.

According to the current classifier of economic activities, NACE-2010 [6], industries include:

- mining and quarrying;
- processing industry;
- supply of electricity, gas, steam and air conditioning;
- water supply, sewerage and waste management.

Including 2018, the bodies of the State Statistical Reporting published information on the state and development of industry in Ukraine according to the above list of industries.

However, as of mid-2020, a significant amount of public statistical reporting, covering the period up to and including 2019, did not contain information on the results of management of water supply, sewerage and waste management [7]. At the methodological level, this complicates the analysis of the dynamics of industrial production and interpretation of its results, as there is a change in the base of comparison. Therefore, this feature of statistical accounting must be taken into account in further research.

As of the beginning of 2019, the largest share in the industry was the products of the processing industry – 72.3%; mining – 15.1%; electricity, gas and steam supply – 11.4%; water supply and drainage – 1.3%. The magnitude of the corresponding structural shifts was estimated by the coefficient of average linear growth of particles, which during 2013-2018 was 0.85%. This means that in recent years, industrial production in Ukraine has had an almost stable structure that has hardly changed over time.

Special attention needs to be paid to the processing industry, the share of which in 2018 was the highest. Its most influential components were the food industry, metallurgy, mechanical engineering and the production of non-metallic mineral products, as evidenced by figure 1.

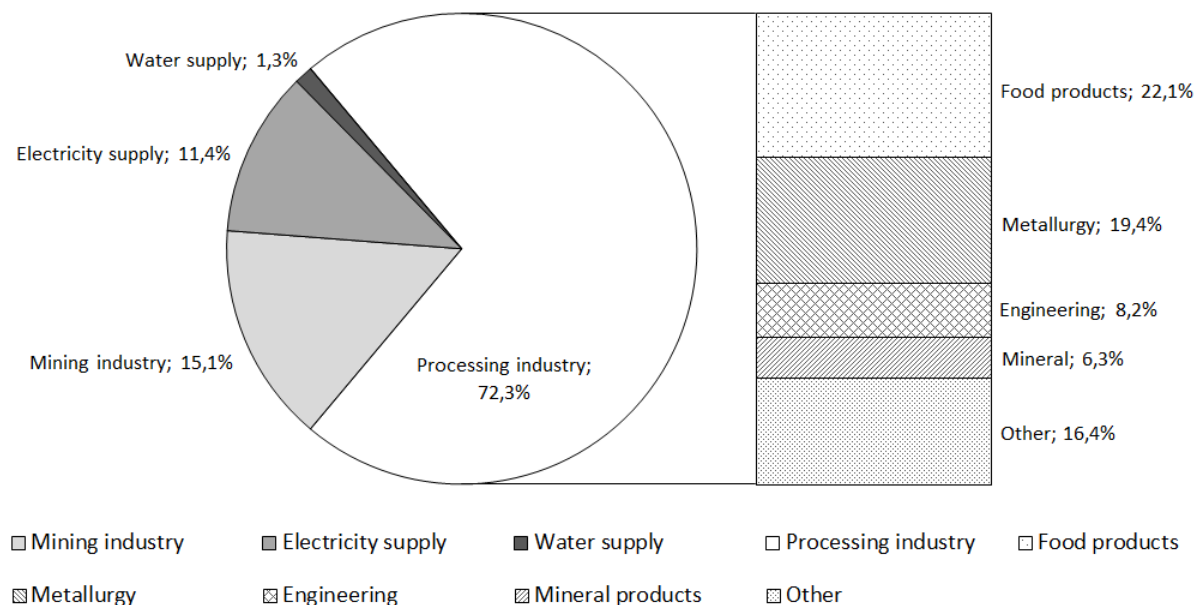


Figure 1: The structure of industrial production according to 2018

The pie chart on the left in figure 1 characterizes the sectoral structure of industrial production. The corresponding histogram on the right shows the composition of the processing industry, other products of which included: textile (1.4%), coke and oil refining (3.8%), chemical (2.8%), pharmaceutical (1.3%), furniture and wood products (7.0%).

The second largest producer is mining and quarrying, which consists of the extraction of hard and brown coal (3.3%), crude oil and natural gas (5.8%), metal ores (5.0%), other minerals and quarrying (1.1%).

Thus, it can be noted that the industry of Ukraine is represented by a wide range of enterprises that meet both the needs of the population in consumer goods and the needs of the real sector of the economy in natural resources and means of production. Given its high impact on the country's GDP, the next stage of the study should be an analysis of the dynamics of key indicators and identify existing trends in their development.

The main indicator that characterizes the state of Ukrainian industry is the annual industry indices of industrial production, calculated by the State Statistics Service according to the methodology in accordance with international standards. In contrast to the volume of output, these indicators no longer contain an inflationary factor, which is positive. The dynamics of the relevant indices during 2013-2019 are given in the Table 1.

Table 1: Indices of industrial production according to 2013-2019,  
% to the previous year

Branch	2013	2014	2015	2016	2017	2018	2019
Industry	95,7	89,9	87,7	104,0	101,1	103,0	99,5
1. Mining industry	100,8	86,3	89,8	101,1	96,5	103,4	98,4
1.1 coal mining	97,6	69,5	63,7	105,6	83,2	106,1	96,9
1.2 oil and gas extraction	96,3	98,3	96,9	99,1	101,8	102,5	100,3
1.3 extraction of metal ores	104,6	93,4	92,5	101,2	91,5	104,4	97,1
1.4 extraction of minerals, quarry development	103,0	95,6	86,5	113,3	110,2	101,2	91,6
2. Processing industry	92,7	90,7	86,9	105,6	105,2	102,9	100,9
2.1 food production	95,0	102,5	89,1	107,4	106,3	98,7	103,3
2.2 textile production	94,1	98,6	96,5	107,9	109,7	96,6	92,5
2.3 manufacture of wood products, printing	102,7	96,0	77,4	98,7	108,8	102,2	94,8
2.4 coke production, oil refining	89,2	78,7	82,7	106,8	93,4	106,8	103,1
2.5 production of chemical products	80,7	85,8	81,9	103,2	102,3	115,3	112,9
2.6 pharmaceutical production	111,8	101,9	91,9	110,4	103,6	95,0	103,7
2.7 production of mineral products	97,4	91,2	95,0	111,1	105,3	100,8	106,7
2.8 metallurgical production	94,7	85,5	86,4	105,0	97,4	100,8	98,6
2.9 engineering	86,4	79,4	85,2	101,8	111,7	112,4	97,8
2.10 production of furniture and other products	90,9	93,0	83,0	106,2	111,9	110,4	103,0
3. Supply of electricity, gas, steam	98,9	93,4	87,0	103,1	94,0	103,0	95,6

As can be seen from table 1, in recent years, the development of industrial production in Ukraine has been characterized by volatile dynamics and the presence of deep crisis phenomena:

- during 2013-2015, Ukraine experienced an economic downturn, which directly affected the decline in output in all industries without exception. During these years, industrial production decreased by a total of – 24.5%, including due to the temporarily occupied territories;
- from 2016 to 2018, industrial enterprises and the economy as a whole began to recover at a slow pace. As a result, industrial production during this period increased by + 8.3%;
- in 2019, the positive trend of economic growth changed in the opposite direction. As a result, the industry again lost – 0.5% of annual output.

Summarizing the above, in 2019 industrial production in Ukraine was only 81.3% of the level of 2012. The dynamics of development of mining and processing industries, as well as the supply of electricity, gas and steam almost fully met these trends. This clearly confirms the urgency of the

problem of ensuring sustainable economic development based on increasing the competitiveness of the domestic production sector.

The volatile dynamics of the targets does not allow us to estimate their average annual growth rates, as such relative indicators will not reflect the general trend in the short run due to high uncertainty. Therefore, in order to determine those types of economic activity that suffered the most from the recession of 2013-2015, we calculated the total growth rate of industrial production over the entire time interval under study. The results of these calculations are shown in Figure 2.

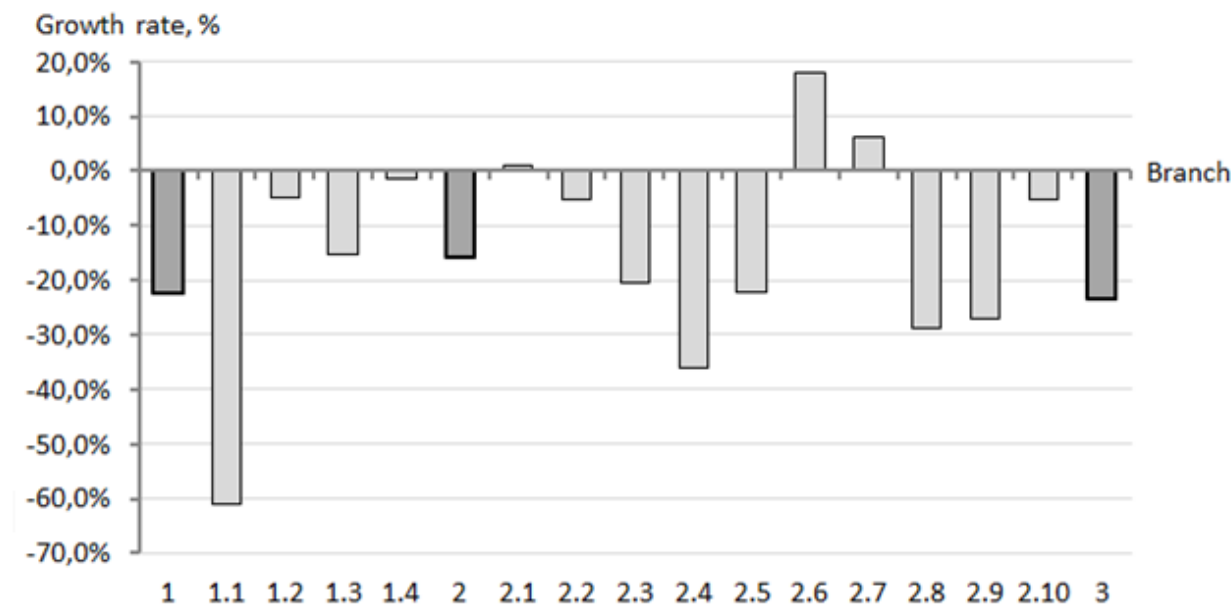


Figure 2: The total growth rate of industrial production during 2013-2019

Designation of types of economic activity on the horizontal axis, figure 2, coincides with the corresponding numbering in table 1. As we can see, the biggest decline took place in the enterprises: mining of hard and brown coal (-61.0%); coke production and oil refining (-36.2%); metallurgy (-28.9%); mechanical engineering (-26.9%); electricity, gas and steam supply (-23.3%); chemical industry (-22.1%) and manufacture of wood and printing products (-20.6%).

Industries that maintained output at a constant level or with the lowest losses during 2013-2019 include: oil and gas extraction (-4.9%), other minerals and quarrying (-1.4%); food industry (+1.0%); textile production (-5.3%) and other products (-5.2%).

Only enterprises producing pharmaceutical (+18.0%) and non-metallic mineral products (+6.2%) had an overall positive trend. However, due to their low share, they did not have a significant impact on the combined industry performance.

Thus, given this situation, the beginning of a new decline in industrial production in 2019, after a short period of growth causes in the expert community reasonable estimates of the possibility of further recession. That is why it is necessary to conduct a more detailed analysis of the dynamics of industrial production indices during 2019. In table 2 shows the quarterly data of the cumulative total for these indices.

The data in table 2 allow us to determine the time period and types of economic activity with the largest reduction in production in relative terms:

- during the first quarter, industry as a whole was characterized by a constant volume of output. This result was achieved due to the fact that the reduction in the supply of electricity, gas and steam by - 6.7% was offset by the corresponding growth of the extractive industry by + 2.6% and the processing industry by + 0.8%;

- in the second quarter, total industrial output increased by + 1.4% compared to the first quarter. Moreover, all industries, table 2, increased production, which is positive;
- the third quarter was characterized by a slowdown in economic growth to a stable level. The exception was the extractive industry, which saw a decrease in production by – 1.9%;
- in the fourth quarter there was a sharp decline in industrial production by -1.7%, as a result of which, according to the results of all 2019, there was a negative dynamics of the target. The leaders in the reduction of business activity for this period were: mining of metal ores (-4.3%) and coal (-4.1%); metallurgical production (-3.3%); electricity and gas supply (-2.4%). At the same time, in some areas of activity there was an economic recovery: the production of chemical products increased by +4.0%; coke and oil refining - by +3.2%; manufacture of wood products and printing - by +1.6%.

Table 2. Cumulative indices of industrial products according to 2019  
at the end of each quarter, %

Branch	I quarter	I-II quarter	I-III quarter	I-IV quarter
Industry	99,9	101,3	101,2	99,5
1. Mining industry	102,6	102,9	101,0	98,4
1.1 coal mining	108,6	105,0	101,0	96,9
1.2 oil and gas extraction	104,8	104,2	101,7	100,3
1.3 extraction of metal ores	98,4	101,5	101,4	97,1
1.4 extraction of minerals, quarry development	93,2	94,1	91,5	91,6
2. Processing industry	100,8	101,8	102,1	100,9
2.1 food production	104,9	105,2	105,4	103,3
2.2 textile production	89,7	91,6	92,3	92,5
2.3 manufacture of wood products, printing	89,6	91,5	93,2	94,8
2.4 coke production, oil refining	101,8	101,1	99,9	103,1
2.5 production of chemical products	92,4	105,0	108,9	112,9
2.6 pharmaceutical production	108,4	108,0	104,9	103,7
2.7 production of mineral products	112,8	107,3	107,4	106,7
2.8 metallurgical production	102,4	103,4	101,9	98,6
2.9 engineering	96,3	97,0	98,5	97,8
2.10 production of furniture and other products	98,0	101,4	104,5	103,0
3. Supply of electricity, gas, steam	93,3	97,0	98,0	95,6

In annual terms, the largest decrease was in mining and quarrying (-8.4%), as well as in textile production (-7.5%). At the same time, the largest increase was observed in the production of chemical (+12.9%) and non-metallic mineral products (+6.7%).

Given the trends that took place during 2013-2019 in industrial production, the problem of efficient use of resources, in particular, labor, comes to the fore. The protracted demographic and socio-economic crisis has led to a rapid decline in Ukraine's population. The number of able-bodied people, some of whom are migrant workers in CIS countries, is correspondingly declining.

Thus, in 2013 the number of employees throughout the economy of Ukraine was 8279.4 thousand people, and in 2018 – 6959,8 thousand people. Thus, the total reduction in their number over these years was -15.9%. In industry, the number of employees for the same period decreased from 2859,4 thousand people to 2102,5 thousand people, or -26.5%. The largest losses of labor resources, at the level of -50.7%, occurred in the mining industry, including due to the temporarily occupied territories.

Thus, the growth of labor productivity is a necessary condition for maintaining the existing volume of industrial production and increase its competitiveness. Estimated data on its dynamics in 2013-2018 are given in table 3.



Table 3. Dynamics of labor productivity in industry according to 2013-2018

Branch	Labor productivity in 2013, thousand UAH	Growth rate according to data 2013-2018		Growth rate of labor productivity, %
		industrial production	number of employees	
1	2	3	4	5
Industry	434,2	0,854	0,735	+16,1
1. Mining industry	388,0	0,782	0,493	+58,6
1.1 coal mining	242,8	0,413	0,278	+48,5
1.2 oil and gas extraction	652,0	0,985	0,811	+21,5
1.3 extraction of metal ores	866,5	0,835	0,898	-7,0
1.4 extraction of minerals, quarry development	304,8	1,045	0,754	+38,5
2. Processing industry	456,5	0,901	0,795	+13,3
2.1 food production	586,7	1,029	0,817	+26,0
2.2 textile production	109,4	1,088	1,048	+3,8
2.3 manufacture of wood products, printing	350,0	0,815	0,987	-17,4
2.4 coke production, oil refining	1462,6	0,693	0,437	+58,6
2.5 production of chemical products	586,3	0,855	0,647	+32,3
2.6 pharmaceutical production	542,2	1,018	1,073	-5,2
2.7 production of mineral products	366,4	1,022	0,852	+19,9
2.8 metallurgical production	713,6	0,762	0,697	+9,3
2.9 engineering	284,2	0,865	0,721	+20,0
2.10 production of furniture and other products	214,8	1,013	0,925	+9,5
3. Supply of electricity, gas, steam	381,3	0,811	0,727	+11,6

In column (2) of table 3 shows the annual estimated labor productivity in the prices of the basic 2013, per employee. In general, in industry, this figure was 434,2 thousand UAH. and exceeded the average economic level, equal to 313,2 thousand UAH. The lowest labor productivity took place in textile production (109,4 thousand UAH), furniture production (214,8 thousand UAH) and coal mining (242,8 thousand UAH).

Columns (3) - (4) calculate, respectively, the total growth rate of industrial production and the number of employees for the period 2013-2018. The calculations of column (3) are based on the indices of industrial production, table 1, which eliminates the inflation factor. For most types of economic activity, the growth rate of these indicators does not exceed 1, which indicates a decrease in their levels. Moreover, in industry, the rate of loss of quantitative composition of labor resources (-26.5%) far exceeded the rate of decline in production (-14.6%), which led to an increase in productivity by + 16.1%, column (5).

As can be seen from table 3, the rapid reduction in the number of employees is a serious problem not only in industrial production, but also at the level of the whole economy, where this annual increase was -3.4%. The situation is improved only by the fact that the main disposal of labor took place in 2014-2015 due to the temporary occupation of parts of Donetsk and Luhansk regions and the Crimea.

## 5. Conclusions.

Thus, in Ukraine for a long time remained inefficient structure of social production, aimed at consumption and primary processing of resources. The lack of modern technologies did not allow to obtain high added value through the production of innovative products. Such

an economy is unable to function for a long time in the context of global trade liberalization. The analysis showed that the temporary occupation of the south-eastern territories of Ukraine in 2014-2015 caused significant losses in the extraction of hard and brown coal, production of coke and petroleum products, mechanical engineering, chemical industry, etc. The return to the trajectory of slow economic growth in 2016-2018 was accompanied by a gradual recovery of all industries except mining. However, it proved to be unstable. Artificial government support for domestic producers of industrial goods, including through protectionism, will only preserve the accumulated problems of the real sector of the economy, which does not contribute to the growth of its competitiveness in the long run. Given the lack of sufficient domestic capital investment and the lack of modern technologies, the main way out of this crisis should be free access of foreign investment to the Ukrainian market and the fight against existing monopolies.

No less important is the prospect of a rapid decline in the working population. That is why the growth of labor productivity must occur at a faster pace.

Thus, in this study the economic analysis of the dynamics of industries based on the methods of general theory of statistics and financial mathematics was further developed, which, in contrast to existing ones, allows cross-sectoral comparisons to determine competitiveness factors and centers of economic growth.

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**ASSYMETRY IN THE HIRED LABOUR REMUNERATION AND  
PRODUCTIVITY IN UKRAINE**

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**Abstract:** *The article examines existing problems in the present asymmetry as relates to the labour remuneration and labour productivity of hired workers in Ukraine. Considered are factors and reasons for the labour compensation asymmetry as well as aspects of a worker's contribution into product manufacturing within the economic system of the country. Methodological approaches are developed for the evaluation of maximum productivity of hired labour on the basis of the Cobb-Douglas production function as an instrument of correlation between product output and labour with capital.*

*Conclusions are substantiated that further proceeding with low labour payment standards and vague correlation between remuneration and labour productivity will serve as a key de-motivation factor negatively influencing further development of economic and labour activity which will directly contribute to the increased migration processes in the country.*

**Keywords:** *labour remuneration, labour productivity, labour compensation, workforce, cost of labour, asymmetry.*

**JEL Classification: J 31**

**UDC: 331.1 (477)**

Under traditional market economy any product of labour is comprised of two different income parts: profit on capital and labour remuneration. This means that the size of compensation for the labour directly depends on the agreement between a working individual and employer, with the latter in most cases having much more stronger negotiation position. However, increasing productivity of an employee in the process of product manufacturing does not necessarily result in the immediate and adequate wage increase. In fact, wage dynamics is rather stipulated by distribution proportions of production results between a worker, employer and a third party - the state, which also has to receive its portion of revenue in the form of paid taxes on production and import.

Any asymmetry in hired labour remuneration and productivity results directly from the existence of social risks as relates to general human development. The most severe problem here remains to be a deliberate lowering of labour remuneration which had been inherited by Ukraine from its old administrative-planned economic system with its low level of wages, high volumes of social expenditures and strictly regulated prices for goods and services. Under transitional economy, the desire to remain somewhat competitive on the world market in the situation of a very high energy and material inefficiency has resulted in continuing the practice of low labour cost. However, at present this very factor can no longer guarantee any competitive advantage, but rather transforms into enormous obstacle for economic growth and human development [1, c. 222-223].

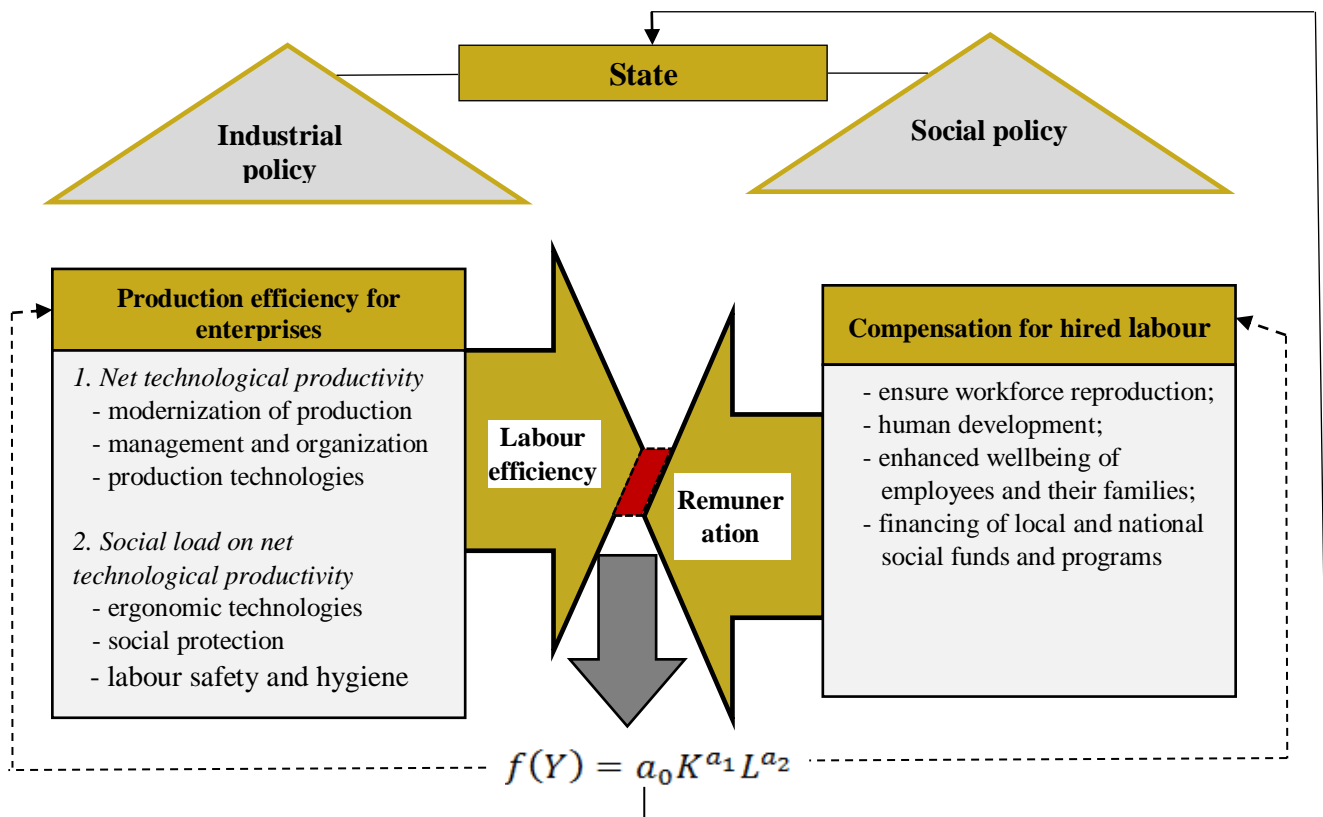
According to the principles of economic theory, the hired labour wages should reflect the marginal income of employees' work. If one employee becomes very production efficient he should obviously enjoy high marginal income since any additional hour of his work will result in significant

increase of production output. Hence, more efficient workers should enjoy higher wages as compared to less efficient ones. Therefore, if employer decides to pay to a highly efficient worker lesser than marginal income from his labour, the chance arises that any other company could easily increase its profit by simply proposing higher wage to such efficient working individual by hiring him over.

Moreover, labour cost per unit of production reflects direct connection between productivity and amount of labour spent for product manufacturing, and thus labour cost should encompass not only wage or remuneration but also all other related expenses incurred by employers, i.e. contributions to the social insurance system. Any increase of labour cost per unit of production indicates growth of remuneration for labour input into such production, yet on the other hand if such increase exceeds labour efficiency and productivity growth this can easily jeopardize competitiveness of the country unless duly compensated by the reduction of other associates expenses.

There is also immediate correlation between the extent of wage increase and labour productivity dynamics: higher labour productivity growth provides for more expansive possibilities to increase wages at the enterprise, which enables such enterprises to ensure extensive reproduction and produce enough products with least expenses while at the same time being able to increase amounts of material stimulus.

The economic context of wages, as an integral part of workforce cost, lies in the need for employer to ensure not only its timely payment but also honouring all other social payments related to employment, including professional training and re-training, refreshment courses for employees, etc. If employer can guarantee comprehensive reproduction of workforce, this adequately stimulates workers to demonstrate higher efficiency. Furthermore, increased expenses by employer for labour force will inevitably lead to introduction of labour-saving technologies thus providing technological basis for increased local and general social labour productivity (Picture 1).



Picture 1. Asymmetry in labour remuneration and productivity

Modern market economy dictates that it is not enough to consider labour productivity as a mere instrument to produce maximum volume of products per unit of time, but more importantly it represents the ability to produce higher quality products or completely innovative products. However,

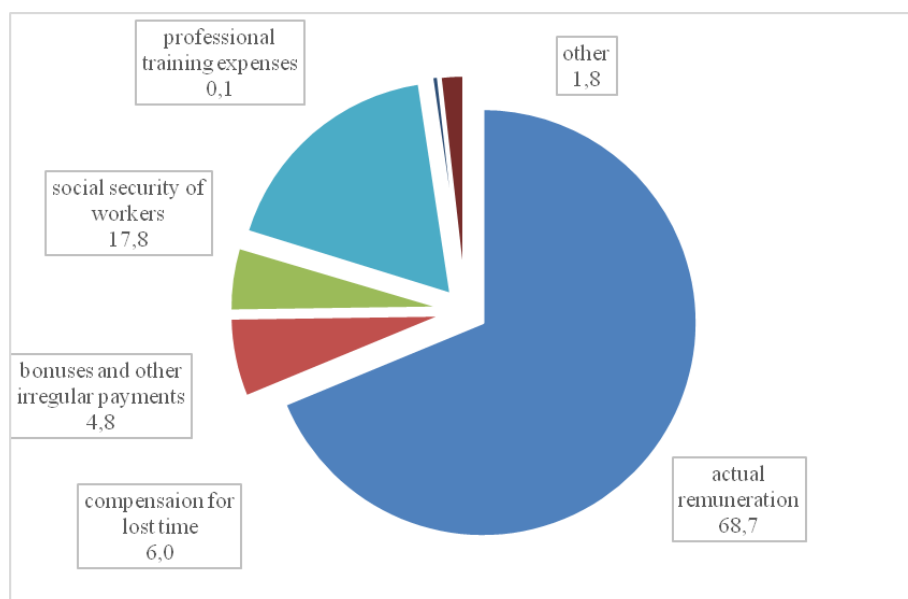
even this approach toward labour productivity should not be idealized since it ensures economic efficiency criteria only from the employer's standpoint when labour expenses constitute just a portion of total expenses and this creates grounds for possible asymmetry in labour remuneration and productivity (low level or reduction of such expenses can be stipulated by low wage rates).

Moreover, it would not be completely correct to compare productivity with real wages received with application of various deflators when determining the cost of workforce for an enterprise. Based on this, it is therefore necessary to distinguish between the real wage for producer, which reflects workforce cost changes on the part of the enterprise, and real wage for consumer which results from the change in the purchasing power of remuneration from the standpoint of all hired workers. Thus, to obtain more accurate evaluation of the correlation between labour productivity and wage increase dynamics it is necessary to use data on changes in actual wages for the producer.

Ensuring rapid pace of labour productivity growth dictates the need to eliminate asymmetry in the sphere of labour remuneration and productivity because there is always a possibility to lose stimulating effect of remuneration. Increased stimulatory role of wages should therefore be based on the strategy aimed at ensuring simultaneous growth of productivity, output and labour remuneration.

In general, the actual situation in Ukraine is that even full employment of family members does not always guarantee sufficient income in such families. For instance, current statistics states that 79% of families which are considered to be poor have at least one employed member. This can be explained by a relatively low level of labour remuneration in Ukraine resulting from low labour productivity especially due to the continuous usage of outdated and inefficient equipment and resource-consuming production technologies.

The analysis of factories' expenses on workforce per sectors of economic activities can only be made on the basis of selective survey data available from the State Statistics Committee of Ukraine which are performed once every four years. The very absence of more accurate and timely data as well as lack of possibility to compare indicators' changes dynamics makes it extremely difficult to obtain solid and comparable data on enterprises' expenses for workforce. Yet, even the available data on distribution of expenses at enterprises for workforce in 2018 demonstrates insignificant, or even negligible, funding by employers for professional-qualification re-training of personnel (0,1 % of total amount) which admittedly constitutes an important pre-condition for labour productivity increase (Picture 2).



Picture 2. Structure of enterprises' expenses for workforce in Ukraine in 2018i, % [2]

Crisis that hit most of the Ukrainian enterprises in 2014-2015 resulted in the need to find alternative possibilities to save and limit expenses (first of all, it led to rapid growth of wages' backlog,

applying the practice of part-time employment as well as reduced finding for professional re-training of personnel). All that allows us to make a conclusion that the situation with distribution of expenses for workforce at enterprises over the period of 2010-2013 had considerably worsened in the country. Such financial difficulties at enterprises were even further compounded by the obligations of timely payments to suppliers, thus the only obvious option to resolve this problem quickly was to pile up the wage backlog. Evidently, any possibilities for increase of labour productivity, let alone labour remuneration, had become extremely limited.

At macro level the labour cost dynamics per unit of production generally reflects the change of structural portion of hired labour remuneration component in GDP - actually this presents the correlation between labour cost (including social security contributions) and GDP size. Analysis of the labour remuneration component changes in GDP as well as marginal labour productivity demonstrates its increase - from 40,8% in 2014 to 43,1% in 2018, with simultaneous reduction of employers' contributions to social security fund - from 26,6% to 17,8%.

This clearly demonstrates increasing gap between real wages for consumers and real wages for producers, which also proves to be true for the Ukrainian economy. Therefore, all this considerably complicates efforts to ensure adequate correlation between growth pace of labour productivity and remuneration because the existing methodological discrepancy leads to increased margin of error in the process of evaluation of such indicators. As a result of such situation, improvement of methodological basis for evaluating the correlation between labour productivity and remuneration becomes a priority in the context of distinguishing real wages from the standpoints of producer and consumer. No less important, however, remain efforts to determine adequate proportions as relates to the growth pace of labour productivity and remuneration.

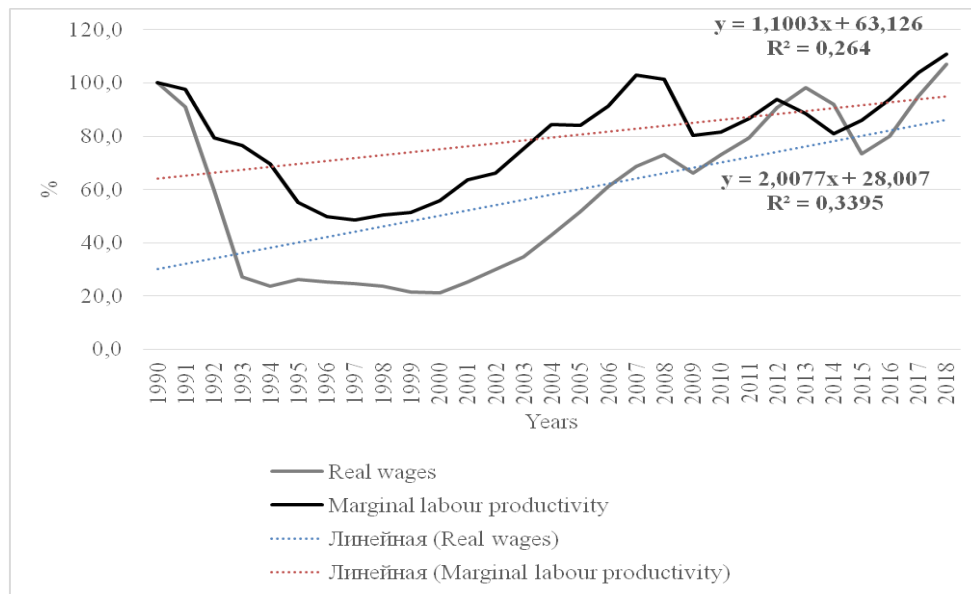
In order to establish asymmetry in the sphere of labour remuneration and productivity we have developed methodological approaches toward evaluation of marginal productivity of hired workers on the basis of the Cobb-Douglas production function as a research instrument to identify connection between product manufacturing and labour with capital. This enabled us to create a function for the national economy of Ukraine (1990-2018) in comparative prices, which has the following expression:

$$Y = 6175,1 \times K^{0,4825} \times L^{0,2906}$$

This function demonstrates that the parameter which characterizes quantitative impact of the volume of capital investments into Ukrainian economy on dynamics of its development, together with the parameter which characterizes quantitative impact of the number of employed by national economy in Ukraine on dynamics of its economic growth constitute 0,4825 and 0,2906 respectively. This means that 1% increase of capital investment will provide production output growth of approximately 48,2%, while increase in employment - by 29,1%. In other words, there is a direct dependence of the production output in Ukraine on dynamics of capital investments and employment level in the national economy. Furthermore, based on the works of modern American economists D. Akerberg, K. Caves and G. Frazer [3] we can state that if  $\alpha + \beta < 1$  this means that production output grows slower than increase of  $K$  and  $L$  factors, and thus the economic growth is non-present (or perhaps other important factors had been overlooked).

Moreover, this allows to calculate average labour productivity in the Ukrainian economy as per key sectors of economic activity (industrial and agricultural production, construction) as a reflection of the extent of employee's contribution into product manufacturing. So, the comparison of average labour productivity and real wage over the time-period of conducted research demonstrates that in parallel with the drop of real wages also observed was the drop in average labour productivity of hired workers in Ukraine. However, the drop in the size of disposable income during crisis years of 1992-1995, 2008-2009 and 2014-2015 was significantly larger than the drop in average labour productivity in the country's economy.

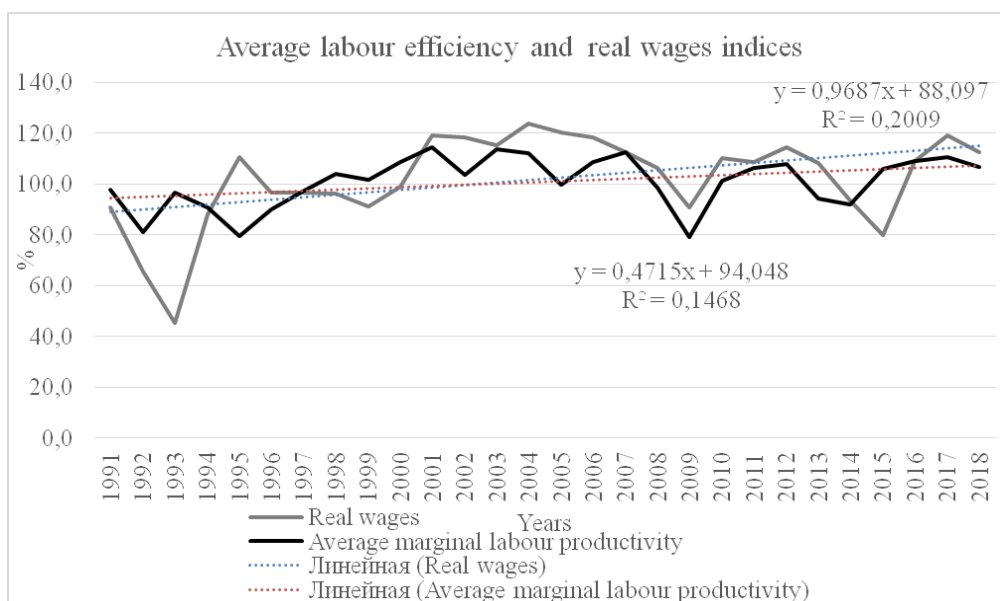




Picture 3. Marginal labour productivity and real wages in economy of the country, %, 1990 = 100%

This explains why enterprises were unable to provide higher level of labour remuneration, as indeed upon the drop in demand for goods and services such enterprises can maintain necessary level of labour productivity only through reductions in employment pro rata such drops in demand. If factories continue paying wages to all its employees, then reduced productivity will cause loss of profit, smaller wages or both at the same time. Still, many Ukrainian enterprises continue laying off their employees which results in higher unemployment rate. Analysis shows that the drop in Ukrainian GDP had been faster compared to unemployment growth during crisis years of 2008-2009 and 2014-2015 due to the fall in marginal labour productivity.

So, the key reason behind low labour remuneration in Ukraine is the low labour productivity of hired workers. Thus, over the period from 2001 until 2018 the average labour efficiency grew 1,6 times while real wages increased by 4,2 times (Picture 4), meaning that the pace of wage growth had been much higher than the pace of average labour productivity growth.



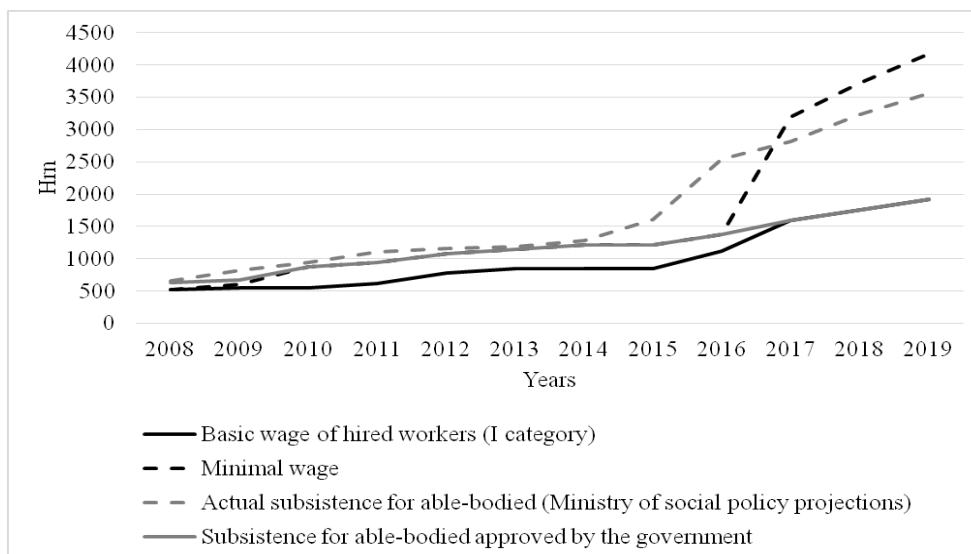
Picture 4. Pace of average marginal labour productivity in economy and real wages in Ukraine

Concerning the extent of asymmetry between labour productivity and remuneration there exist different points of view and explanations. Generally, increase of nominal wage by more than growth rate of labour productivity plus inflation leads to increased labour consumption per unit of production being manufactured. Also, increase of real wages not supported by respective labour productivity growth creates conditions for macroeconomic instability. Under other equal conditions, the long-term macroeconomic stability can be achieved only if wages grow in direct correlation to the labour productivity growth.

The world experience underlines the need to ensure parallel growth of both labour remuneration and labour productivity. In EU countries overall labour productivity growth outpaces remuneration growth, and dynamics of wages can be faster than labour productivity dynamics only in specific exceptional cases and for short time periods. In Ukraine, for instance, now such situation is stipulated by the need to compensate for losses in real income incurred by working personnel over the period of hyperinflation in 1990s, especially with consideration of the fact that the level of wages has been very low and lagging far behind not only the wage level in EU countries but also in some CIS countries.

The pace of wage growth can be faster than that of labour productivity as a result of changes in the size of material expenses or other elements of product cost or operational expenditures. This becomes possible upon reduction of material expenses or other elements related to the cost of the product with respective increase of wage component aimed at ensuring that the price of product does not go up. The main purpose here is to be able to increase wages on the basis of labour productivity growth within such limits that would ensure reduction of labour expenses per unit of products which then allows for greater growth of labour productivity compared to the growth of remuneration. This would help achieve higher labour productivity and remuneration with current effective prices or even with such prices going down. To attain this goal additional investments should be attracted and innovative activities expanded [4, P. 90].

However, to ensure relative symmetry between remuneration growth and growth of labour productivity in the country it is required that the minimal wage be capable of performing stimulatory function and become a guarantor of social security of hired personnel, thus it should be higher than actual hand-to-mouth subsistence. As per EU standards the size of minimal wage should be 2,5 times the size of subsistence which, regrettably, is far from true in Ukraine [5, P. 84] (Picture 5).

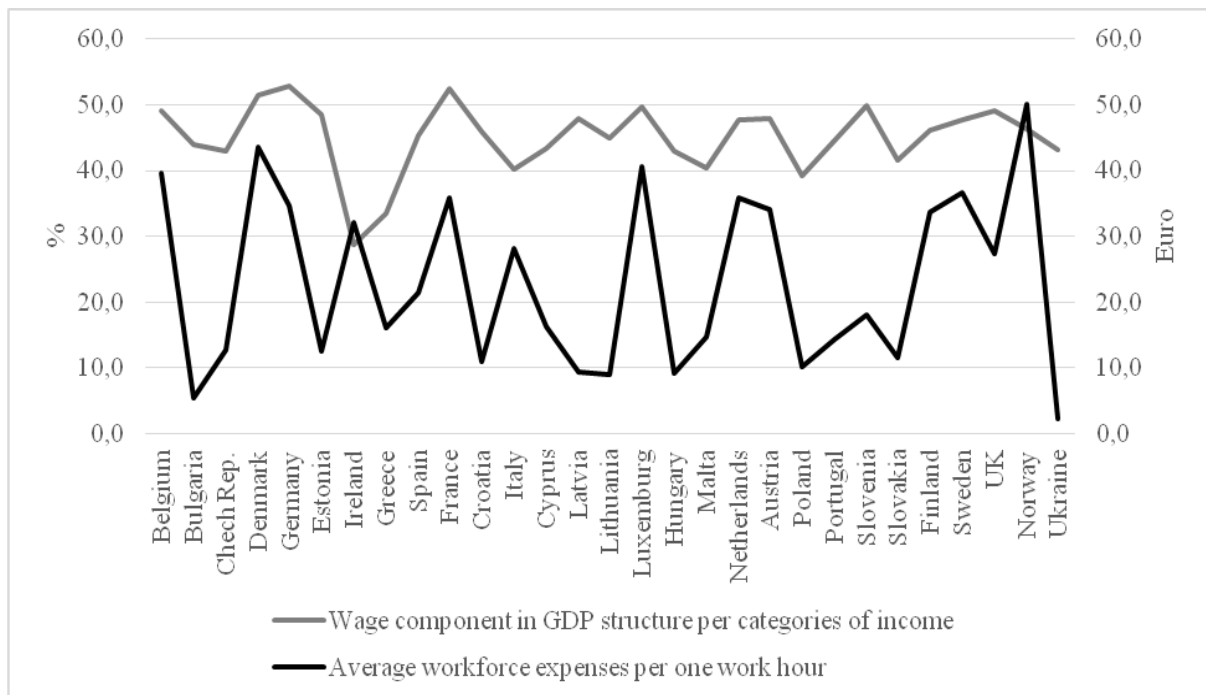


Picture 5. Dynamics of changes in the state standards of Ukraine

Analysis of labour productivity indicators per sector of economic activities allows us to state that low productivity stipulates low labour remuneration of hired personnel and vice versa - low wages (as basis for social contribution payments by employers and formation of wage fund for hired

workers) leads to low productivity, since it limits the size of created added value. For instance, in the spheres of education and health protection, where facilities mostly exclusively belong to public area, over 85% of total added value go to wages. And as a result of low wages (in education - 20,6%, and in health - 34,0% lesser than average level in the country) these types of activities produce one of the lowest rates of labour productivity. Obviously, we have to take into consideration the specifics of such types of activities: non-market character of services, low component of material expenses, etc. Same specifics becomes even more true for the state administration, however here we observe completely different correlations: component of remuneration in total added value is highest among all types of economic activities (93,6%), and therefore wages are among highest (by about 43,2% more than average) and labour productivity is also close to average rates for the economy. Yet the highest rate of productivity (three times the level of average in the economy) is demonstrated by financial activities where wages are the highest (almost two times higher than average in the country) and gross income constitutes almost 55% of total added value.

From the point of view of neo-classical growth theories, increase of labour productivity is considered an endogenous indicator which is determined by the dynamics of aggregate demand and real wages. With prolonged low or even zero wage growth the labour productivity falls as investments into research and development become irrelevant along with increased capital intensity of production and introduction of labour-saving technologies. The study conducted across selected OECD countries has shown that the growth of real wages by 1% brings labour productivity growth of 0,3%, and in some countries (France, Germany, Netherlands, Great Britain, USA, Scandinavian countries) - by 0,38% [6, p. 4-5].



Picture 6. Hired workers wage component in the structure of GDP as per income categories and average expenses for workforce per one work hour in Ukraine and other EU countries in 2018

Structuring of GDP per income categories demonstrates that generally modern distribution proportions in Ukraine are similar to those in most countries of the Europe (Picture 6), however with relatively high rate of wages component in GDP the average workforce expenses per one work hour remain at the lowest level (in 2018 those were just meagre 2,3 Euro).

To a large extent the hired workers wage component is maintained at a high level due to the largest rate of social contributions paid by employers which provides almost a quarter of total volume

of labour remuneration. So, according to the World Bank data Ukraine remains an obvious leader among the 10 countries subject to monitoring both as per volume of tax burden on labour as well as the amount of taxes and obligatory contributions which should be paid by the companies out of their wage funds (Table 1).

Table 1. Size of the tax burden

Country	General tax rate (% of profit)	Labour taxes and payments (% of profit)	Labour taxes portion in general rate (%)
<b>Ukraine</b>	37,8	<b>24,8</b>	65,6
Georgia	16,4	0,0	0,0
Peru	35,6	11,0	30,8
Bulgaria	27,1	20,2	74,5
Serbia	39,7	20,2	50,9
Bolivia	22,7	18,8	22,5
Guatemala	35,2	14,3	40,6
Paraguay	35,0	18,6	53,1
Armenia	18,5	0,0	0,0
Indonesia	30,0	11,5	38,3

Source: [7]

Moreover, lineal approximation of the connection of real wages and marginal productivity with the lead of one of parameters confirms that greater interconnection has dependence on employers obtaining increased productivity first and then raising labour compensation to hired personnel.

Problems of labour remuneration and protection of employees' income become especially serious in the situation of global recession. Traditionally, in Ukraine greater attention has always been paid to the remuneration problems in public sphere, however in the so called real sector of economy, where wages are generally higher than average, the situation also happens to be very difficult. As the experience of 2008-2009 and 2014-2015 crises has demonstrated, the negative effect was mostly observed in industry and construction spheres. Specifics of labour remuneration in these types of economic activities lies in the fact that the amount of remuneration for labour is in most cases directly dependent on output results (especially under piece-rate pay system). But nowadays this output mostly depends on the used technologies and equipment rather than qualification and efficiency of an employee. So for instance, wear and tear of assets in industry is generally around 69,4%, in processing industry - 76,4% [8, p. 5]; which means that the outdated equipment and technology very much limit possibilities for productivity growth in the real sector.

Currently, discussions are being held at many international forums to determine ways to fight "great recession" by either giving preference to severe austerity measures (including reducing of wages) or attempt restoring growth by stimulating consumer demand and employment with increased wages for employees. ILO experts maintain that under existing budgetary and household debt burden in many countries, which make obtaining new loans very difficult, any limitations on wage growth and labour market deregulation would not be able to support sustainable economic recovery but rather lead to prolonged stagnation in production and labour productivity. Thus, real wages can and should grow, however this process should be closely connected to a balanced macroeconomic policy, notably low interest rates and progressive taxation schedule for high-profit groups [6, p. 20-21].

Preserving significant wage differentiation as one of the most severe social shocks of covariance type is directly connected with the absence of correlation between the level of labour income received and professional-qualification level of employees [9]. The low standards of labour remuneration enable employers to avoid any efforts aimed at modernization of technical and technological base as well as ignore introduction of any innovations aimed at reducing material and energy consumption. So, in the structure of operational expenses from sold product (works, services) the portion of expenses for labour remuneration together with deductions to social funds constitutes

meagre 9%, while the component of the cost of goods and services purchased for re-sale and resold without any additional processing reaches 53%, with material expenses at 27%. As a result, almost 60% of the output goes to the intermediate consumption.

In general, it has to be noted that the impact of labour remuneration as a factor of many social risks becomes multifaceted and spreads in different directions; it is therefore not only limited to the labour sphere but rather embraces the entire human development risk system. Low labour remuneration as well as its excessive and unsubstantiated differentiation contributes greatly to increased social inequality and leads to marginalization of low-paid workers thus causing social instability. Also, growing mobility resulting from the search for better pay leads to migration losses among the population as well as depopulation of areas with less vibrant economies.

Continuing with the low labour remuneration standards and weak connection between wages and labour productivity will de-motivate economic growth and labour activity as well as stimulate migration processes. This can also aggravate social shocks of dynamic type related to the outflow of the most productive part of the population which would eventually negatively impact the quality of human capital [10]. *(When classifying shocks by the time of their occurrence it is possible to distinguish static and dynamic social shocks, with the reasons for the latter being, first of all, existing differences in the leverage of unions as relates to the social-labour relations as well as differences in the tendency of inflation-unemployment connection shifts which stipulates different speed of wage increase).*

Lack of effective coordination as relates to determining adequate wage is resulting from the absence of institutionalized information system with regard to prices in the labour market, i.e. information about the level of wages in various groups of workers. Such information remains "private data" for some companies and has not been translated into a "public benefit". Special reviews of wages being conducted by the Ukrainian consulting companies can not fill this informational gap as those are mainly based on very small and specific selections. As a result, some employers were able to significantly overpay their personnel by setting their wages well above the market level, while others - greatly underpay their employees. This inevitably expands asymmetry in the sphere of labour remuneration as well as in worker's contribution into product manufacturing.

All that creates a sort of deadlock when without such information disclosure it is impossible to ensure coordination in establishing labour remuneration, while the very lack of such coordination prevents necessary informational transparency. Employers who fear losing most productive of their employees consider it is better not to share such information with the others and keep it classified. However, by hiding such rate signals from each other they in fact deprive the labour market of needed pricing transparency, without which its operation would never be efficient.

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## **PENSION INSURANCE AND ITS DEVELOPMENT IN UKRAINE AND MOLDOVA**

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**Abstract:** *Varieties of pension insurance are considered: joint pension insurance, funded pension insurance, compulsory pension insurance, voluntary pension insurance. The world strategies, models and levels of pension insurance are considered. Each state has chosen its path of building a pension system based on its own demographic and socio-economic characteristics of development. Nevertheless, the main tasks of any pension system are to protect against poverty and to provide a pension that could guarantee a decent standard of living for the pensioner. The analysis of pension insurance and its development in Ukraine and Moldova is carried out. The analysis suggests that joint pension insurance alone cannot cope with the provision of an aging population of countries. The conclusion is drawn on the insufficient development of voluntary funded pension insurance in the studied countries and the need to introduce mandatory funded pension insurance. An author's model of the formation of an optimal pension insurance system is proposed, which describes the problems, their solutions and the purpose of pension insurance.*

**Keywords:** joint pension insurance, funded pension insurance, compulsory pension insurance, voluntary pension insurance, pension funds, life insurance companies, banks.

**JEL Classification:** F65, H55, G22

**UDC:** 369.5:368.914 (477+478)

### **1. Introduction**

In world practice, the main criteria for the effectiveness of the pension system are: sufficiency, financial stability, reliability and acceptability of costs. Now 9% of the world population is retired by age. By 2070, according to the UN, this figure will reach 20%. Pension systems around the world are facing unprecedented life expectancy and growing pressure on public resources to pay older people [8]. That is why, in order to guarantee a decent standard of living, one needs to analyze pension insurance in different countries. The development of Ukrainian and Moldovan pension insurance requires further reform of the pension systems of the studied states. Pension reforms are driven by an aging population, which leads to a shortage of pension funds.

### **2. Analysis of recent researches and publications**

The problems of reforming the pension insurance system against the background of modern trends in socio-economic development are becoming increasingly important. In this sense, the works of such scientists are of interest: Datsenko V. V. [5], Evtushenko N. M., Puchko A. O., Tsaruk A. Yu. [7], Zhmurko I. V. [8], Zubik S. P. [10], Kyrylenko O. P., Malinyak B. S., Petrushka O. V. [22], Konina M. O., Reha K. Z. [12], Levaeva L. Yu., Kucherenko M. A. [13], Petrushka O. V. [20], Prokopenko V. Yu., Mishenko V. S. [21], Slobodyanyuk N. O., Reha K. Kh., Bragina O. O. [24], Chugunov I. Ya., Nasibova O. V. [25], Shcherbakova V. I. [26].

### **3. Paper's objective**

Paper's objective – to research the problems and development trends of Ukrainian and Moldovan pension insurance.

### **4. Research Content**

Pension insurance is joint and cumulative. Joint pension insurance provides for compulsory pension for people who have reached retirement age at the expense of working citizens (always compulsory). Accumulative pension insurance is compulsory and voluntary. Voluntary pension

insurance is based on the voluntary participation of citizens in the deduction of funds from their salaries to pension funds, insurance companies or banks (Figure 1) [11].

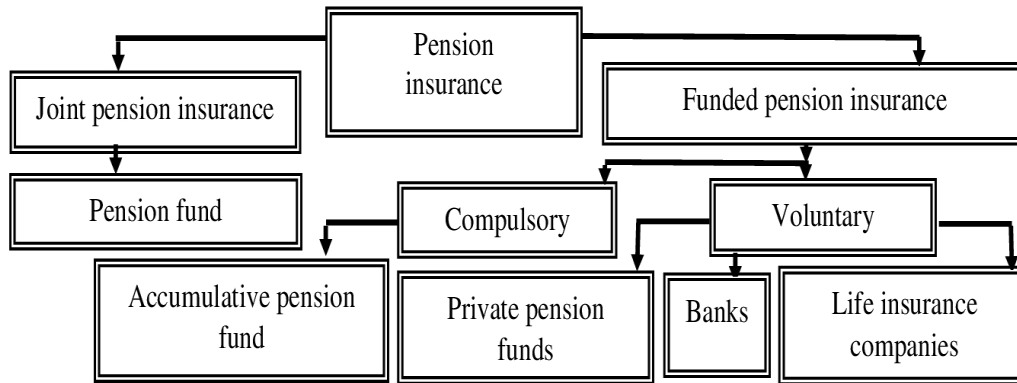


Figure 1: Pension insurance

Source: developed by the author.

The problem of effective formation and implementation of state policy in the field of pension provision has always been and remains relevant, because the most important component of the welfare of citizens, which demonstrates the true desire of the state to adhere to the principles of humanism. software. This right is realized through the provision of pensions, that is monthly cash payments for the purpose of material security of citizens due to the occurrence of social risk.

However, in recent years due to the unfavorable demographic situation in Ukraine, declining employment, inadequate wages, increasing the ratio between employees and retirees in favor of the latter, the existing solidarity pension system has been unable to quickly and fully meet modern needs [22].

In most countries of the world there were the same problems as in Ukraine. But thanks to pension reform, they have achieved successful results. Each state has chosen its path of building a pension system based on its own demographic and socio-economic characteristics of development. Nevertheless, the main tasks of any pension system are to protect against poverty and to provide a pension that could guarantee a decent standard of living for the pensioner. For a more detailed consideration, we analyze the strategies and models of pension insurance in different countries (Table 1).

Table 1. Pension insurance strategies and models

Strategy	Model	Pension system levels		
		1	2	3
Solidarity	Soviet	State pension (jointly)	–	–
Jointly-accumulative	Russian-Polish	State pension (joint)	Compulsory insurance	Accumulative (corporate, personal)
Accumulative and solidary	American	State pension (joint)	Labor (corporate)	Accumulative (personal)
	German (production)			
Conditionally accumulative	Japanese	Basic pension	Additional state and corporate	–
Accumulative	Chilean	Mandatory funded pension	Compulsory insurance	–
	Kazakh	Compulsory funded pension in the state pension fund	Voluntary accumulative pension	–

Source: [8].



The Ukrainian authorities have decided that the Russian-Polish model of the pension system will be implemented in our country. Today, there is almost no use of solidarity and accumulation strategy in its purest form, as most states are supporters of a mixed strategy. Therefore, the leadership of Ukraine plans to use the solidarity-accumulation model, in which all three levels will operate [8]. Despite the fact that the operation of the accumulative system of state pension insurance was provided for by the Law of Ukraine "On Compulsory State Pension Insurance" of July 9, 2003, it has not been introduced since then.

In Ukraine, the share of pension spending in budget revenues in 2018 was the highest in the world and amounted to just over 18% of GDP. In 2019, budget expenditures on pensions increased by another 27.2 billion UAH compared to the previous year, reaching 166.5 billion UAH. We are also leaders in Europe's highest percentage of contributions to the Pension Fund, in the amount of 35% of total wages [4]. In both Ukraine and Moldova, compulsory pension insurance is represented by joint pension insurance (Table 2).

Table 2. The main indicators of joint pension insurance in Ukraine and Moldova

Indicator	Country	
	Ukraine	Moldova
Retirement age, years:		
men	60	63
women	60	59 (from 2028 – 63)
Work experience, years:		
men	27 (from 2028 – 35)	34
women	27 (from 2028 – 35)	32 (from 2024 – 34)
Minimum pension, euro	56,7	57,9
Average pension, euro	104,9	94,4
Maximum pension, euro	566,7	The size is not limited (they plan to install 1 788).

Source: [3; 6; 19; 23].

As for Ukraine, our state, like most European countries, has taken the path of increasing the retirement age (up to 60 years) and insurance experience (up to 35 years). In Moldova, the retirement age is also being increased, for men it is already higher than the Ukrainian by 3 years, and for women it will become that in 2028. As for the length of service in which a citizen can count on a pension, in Ukraine it is 27 in 2020. 27, but it will gradually grow and in 2028 will be 35 years old. In Moldova, the minimum length of service is already in 2020, 34 years for men and 32 years for women.

Table 3. The main indicators of voluntary funded pension insurance in Ukraine and Moldova

Indicator	Country	
	Ukraine	Moldova
Private pension funds		
Number of established funds, pieces	65	3
The number of operating funds, pieces	65	0
Life insurance		
Number of life insurance companies, pieces	22	1
The share of life insurance in the total amount of insurance premiums received, %	13	7
Bank deposits		
Average interest rate in national currency for individuals, %	10,87	4,86
Average interest rate in foreign currency for individuals, %	1,23	1,01

Source: [1; 2; 14; 15; 16; 17].

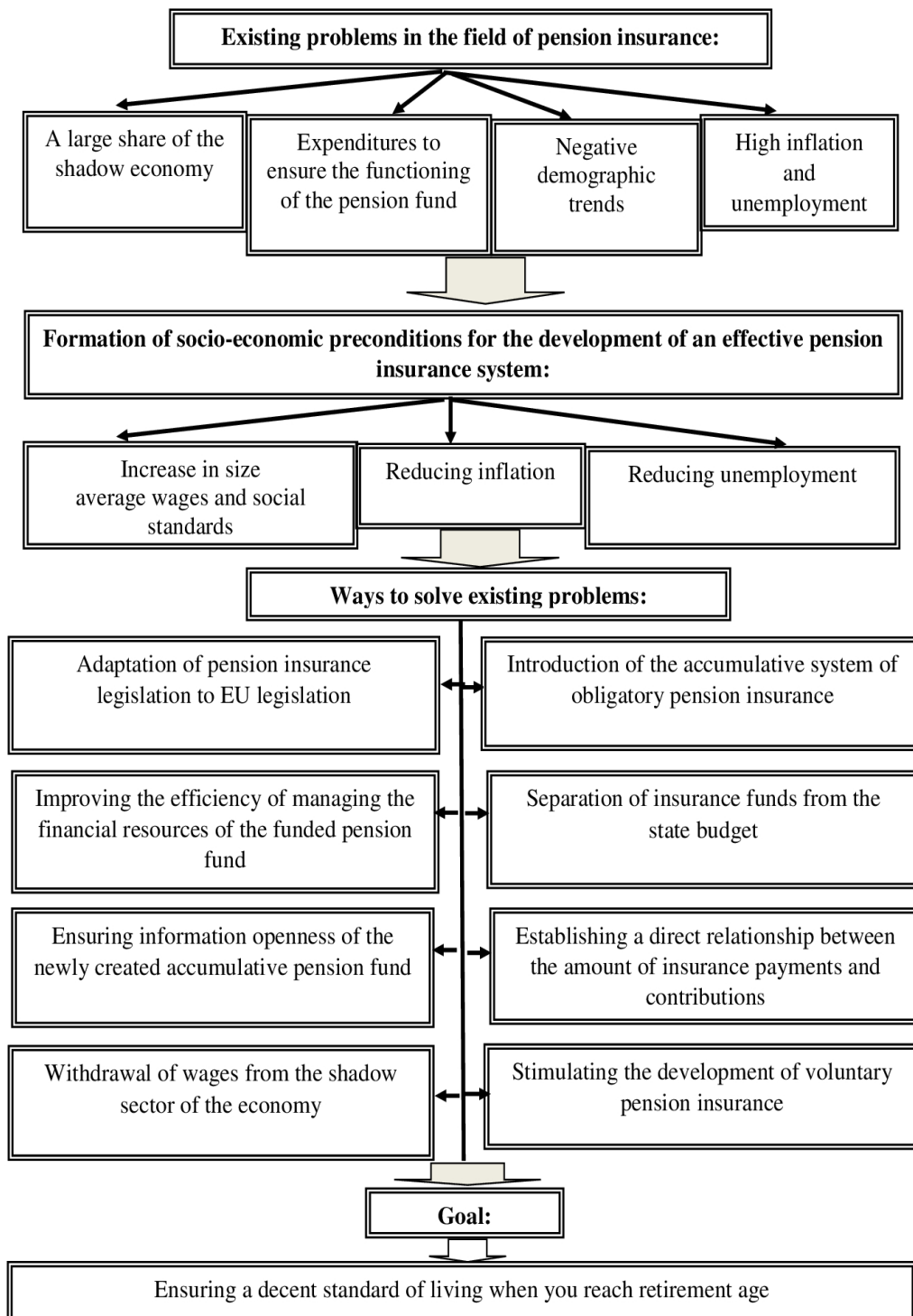


Figure 2. Model of formation of the optimal pension insurance system

Source: developed by the author.

In Ukraine, the launch of mandatory funded pension insurance has again been postponed, and this will lead to the fact that the state budget will not be able to contain such a large number of pensioners, and even pay the minimum that pensioners receive today. In addition, according to experts, a third of the country's able-bodied population (about 6 million people) work without work

books, without paying taxes and pension contributions. The same number of workers get paid in envelopes. Thus, more than half of working Ukrainians shy away from paying contributions to the Pension Fund [4]. At the same time, evading contributions, most people do not save money for old age, but rely on a joint pension insurance system.

In Moldova, over the past 10 years, the possibility of creating compulsory private pension funds has been studied as an instrument for generating additional income for state pensions, but they have not been created [1].

In the countries studied, joint pension insurance supplements voluntary funded pension insurance (Table 3).

An analysis of Table 3 suggests that three private pension funds are officially established in Moldova, but none of them work. In Ukraine, the situation is slightly better: the number of private pension funds is 65, but at the same time the number of concluded pension contracts amounted to only 77.1 thousand in 2019, pension contributions amounted to 83.75 million euros, and payments - 36.72 million Euro. As for life insurance, in Ukraine the share of life insurance in the total amount of insurance premiums received is insignificant and amounts to 13%, in Moldova this figure is even lower - 7%. Despite the reduction in interest rates on deposits, they remain the most popular tool for accumulating funds for old age in the studied countries.

Given the low level of development of voluntary pension insurance and the crisis of the joint system, the solution to problems in the field of pension insurance in Ukraine and Moldova may be the introduction of mandatory funded pension insurance, which, under favorable conditions, can stimulate savings, investment and contribute to economic growth in the country.

As a result of the above arguments, below is a model of forming an optimal pension insurance system (Figure 2).

## 5. Conclusions

Successful implementation of mandatory funded pension insurance in Ukraine requires at least three to five years of serious reforms in the regulation and development of capital markets. Today, financial markets are not able to offer financial instruments that would ensure the profitability of future retirees [17]. But no matter what problems stand in the way of developing pension insurance, the problem of low pensions and shadow wages can be solved only by introducing the second level of pension insurance - funded mandatory pension insurance. And for this you need to have a growing economy, a stable national currency and freedom.

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## PECULIARITIES OF TECHNICAL MEANS OF MEAT PROCESSING INDUSTRY IN UKRAINE

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**Abstract.** *The state of meat and meat products production in Ukraine is described and analyzed. The influence of these parameters on the formation of the machinery and equipment fleet of the domestic meat industry, as well as the possibility and feasibility of providing this industry with food technology of Ukrainian production, is evaluated. The prospect of domestic machine building for meat production is to identify fairly narrow segments of equipment of medium technical complexity (for example, very well-developed top designs), which should be improved to maintain its own niche in the domestic equipment market and possible entry into the markets of other countries. But for the technically sophisticated meat cutting equipment (bowl cutters and emulsifiers), powerful casing fillers, automatic brine injectors, etc. it's advisable to import until our machine building enterprises reach such a technical level that would really make it possible to produce equipment that is competitive on the world market. Mastery of innovative solutions in the field of equipment for the meat industry is facilitated by properly organized technical regulation, in particular the standardization and harmonization of national standards with international and European ones.*

**Keywords:** *meat and meat products, technological equipment, innovation, standards, harmonization of national standards, food industry.*

**JEL Classification:** L66, O31

**UDC:** 338.439.4: 311.172 (477)

### 1. Introduction

Despite the widespread prevalence of equipment for the food and processing industry at numerous enterprises of this profile, the issue of updating the machinery and equipment fleet and technical improvement of such equipment has been outside the field of view of scientists and specialists for years, negatively affecting the development of the domestic industry in the above-mentioned industrial sectors. The reality is that the main export products to Ukraine continue to be agricultural raw materials and low-processed products - respectively, the main focus and most of the

investments are directed to this sector, but investments in machine building are declining. On the other hand, sales of finished foods or high value-added food raw materials on foreign markets would significantly improve the financial situation of processing and food enterprises, and would have the necessary funds for innovative updating of applied technologies and specialized equipment. However, so far there has been a dominance of foreign specialized equipment at domestic enterprises - both high-tech models and machines and apparatuses of medium and low complexity, the production of which has already been mastered, can be quickly mastered at the enterprises of the domestic machine-building complex.

## **2. Recent research and publications analysis**

Nowadays, the concept of a "food system" is gaining ground, which covers all processes related to the cultivation, collection, processing, packaging, transportation, marketing, consumption and disposal of food and packaging. One of the important components of this concept is food production [1, 2]. The food system distinguishes certain types of industrial activity, the results of which determine the level of food security in the country. In this sense, the meat processing industry is an important component of the production unit of the food system [3], which is characterized by a variety of technological processes and specialized equipment used for the purpose of their implementation [4-7], including those intended for small meat processing enterprises in farms [8]. In addition to the traditional equipment for the primary processing of slaughter animals and the production of meat products, in the modern practice of the meat industry, a number of innovative physical and biotechnological methods are used [9-11], which are selected for application based on various technical and technological criteria, the main of which is energy efficiency [12, 13]. Without the involvement of innovative technologies and appropriate means of production, it is impossible to achieve progress in the food industry, in particular its industry such as meat and meat processing industry [14, 15].

## **3. Purpose of the article**

The purpose of this article is analysis the current state of the meat and meat processing industry of Ukraine and justification, based on the indicated condition, opportunities and prospects for the development of the production of specialized technological equipment for the meat industry at domestic machine-building capacities, the main areas of innovation, as well as technical regulation in this area.

## **4. Results and discussion**

Despite significant fluctuations in the number of flocks of slaughter animals and poultry in recent years, amounts of slaughter and primary processing of animals in Ukraine remain significant. According to the State Statistics Committee of Ukraine, in 2018 meat production in Ukraine amounted to 2355 thousand tons in slaughter mass. Five years ago, in 2014, the value of this indicator amounted to 2360 thousand tons. Therefore, since 2014, meat production in the country decreased by only 0.2%, that is, practically unchanged.

The volume of beef and veal production in 2018 in Ukraine amounted to 359 thousand tons, therefore, there is a decrease compared to 2014, in which the value of this indicator amounted to 413 thousand tons of beef and veal meat in slaughter mass. In 2018, the share of beef and veal in the total meat produced in Ukraine was only 17.5%. In 2000, this parameter reached 45.4%, and the reasons for such a significant reduction in beef and veal are the shortage of bovine animals, exchange rate fluctuations, as well as the unstable economic situation in the domestic and foreign markets. In 2018, pork production amounted to 703 thousand tons, which is less than in 2014, when 743 thousand tons of pork were produced in slaughter weight. In 2018, the share of pork in the total volume of meat produced in the country amounted to 29.9%, second only to the volumes of poultry meat production (for comparison: in 2000, the share of pork in the total volume of raw meat was 40.7%). For five years, the volumes of mutton and goat meat production have not changed. And in 2014, and in 2018. The value of this parameter was 14 thousand tons in slaughter weight. Accordingly, the share of lamb and goat meat in the total meat production has changed - 0.6%, which is slightly less than in 2000,

when this indicator reached a value of 1%. In 2014, 12 thousand tons of horse meat were produced, in 2018 the value of this parameter decreased significantly - 8 thousand tons (the share in the total meat production is 0.3%).

The inheritance from the Soviet Union to independent Ukraine left a distorted structure of the machine-building complex, when enterprises that produced technological equipment for equipping food, including meat, processing enterprises, both in equipping and in personnel qualifications, and in technical level were always inferior to machine-building enterprises that they produced defense products, as well as aviation equipment, various machine tools, etc. Machine-building enterprises for the food industry (Poltava meat-processing machine-building plant, Donetsk food-processing machine-building plant, Cherkasy food-processing machine-building plant, etc.), however, they produced reliable and efficient technological equipment, which was appreciated practitioners of the meat industry and was in stable demand in the USSR and other countries. Today, several domestic machine-building enterprises produce food, in particular meat-processing equipment - these are Poltavamash OJSC, and DUCO-TECHNIK LLC (Dnipro), and NPP Tekhinserv LLC (Dnipro), etc. However, while the majority of machines and devices used in Ukraine for slaughter and primary processing of animals, as well as for the production of meat products, imported to our country. Most often, financially less powerful, small and medium-sized meat processing enterprises are equipped not with new, but with renewed meat processing equipment, which was previously used at enterprises in Germany, the Netherlands, Poland and other countries of Western and Central Europe. Some German, Austrian, Polish, Spanish and other West European manufacturers of meat processing equipment have their representative offices in Ukraine, other foreign engineering companies prefer to work through commissioning enterprises specializing in the complex construction and equipping of new and reconstruction of existing meat industry enterprises. Commissioning enterprises and firms organize the import of equipment from foreign manufacturers, including the restoration of machines that were in use. The profile of the activity of about 15 domestic enterprises (LLC "Matimex-Ukraine", LLC "FoodPlant", LLC "Schaller-Kyiv", etc.) is precisely the import and implementation of equipment for slaughter shops and meat processing enterprises, as well as technological design, assistance in mastering technological processes, development of normative and technological documentation, staff training, supply of food ingredients and supplies etc.

Previously, various technological equipment for slaughter and primary processing of animals, to a large extent, were domestic-made immobilization boxes, conveyor systems, and hide removal equipment, although they were too oversized and metal-containing, were successfully used at domestic enterprises and exported to other countries. Now the current trend is the concentration of animal slaughter in small enterprises, determines the demand for simple universal machines that do not require large production facilities. In Ukraine, technological equipment of this profile is produced by OJSC Poltavamash, LLC Mega-Tech (Yarmolintsy, Khmelnytsky Region), and some other enterprises. Specialized technological equipment for this purpose is also imported from Poland, Austria, Denmark, the Netherlands, Germany and other countries.

Over the past years, Ukraine has not lost its relevance in the trend towards an increase in the share of poultry meat in the total volume of raw meat, which, according to slaughter mass, in 2018 amounted to 53.5%, which is 4.7 times higher than the value of this parameter in 2000. This forced the meat product manufacturers to significantly work on updating the technologies used, since traditional recipes for sausages and other meat processing products provide for only limited use of poultry meat. In 2018, 1259 thousand tons of poultry meat were produced in slaughter mass, which is significantly higher than the 2014 indicator (1165 thousand tons). Since 2014, domestic producers of poultry meat have been operating in the capacious and promising market of the European Union, exporting to the Netherlands, Germany, Romania, Ireland, Estonia and others. Ukrainian poultry meat is also in great demand in important solvent markets in the Middle East. During 2018, 12 thousand tons of rabbit meat were produced - in slaughter mass, which amounted to only 0.5% of the total meat produced in Ukraine for slaughtered animals and poultry, with the fate of rabbit meat produced by households being preferred. A slight decrease in the production of this type of meat is observed, since in 2014 the value of this parameter amounted to 13 thousand.



In 2018, 248 thousand tons of sausage products were produced in Ukraine, less than in 2014, when 260 thousand tons of these products were produced. The structure of the main products for the indicated group is as follows: 2014 - cooked sausages, frankfurters, sardellas - 171 thousand tons, half-smoked sausages - 47 thousand tons, cooked smoked, semi-dry, raw and raw smoked sausages 25 thousand tons; 2018, 168 thousand tons, 41 thousand tons and 24 thousand tons respectively. The general dynamics of the production of meat products in Ukraine is shown in Fig. 1.

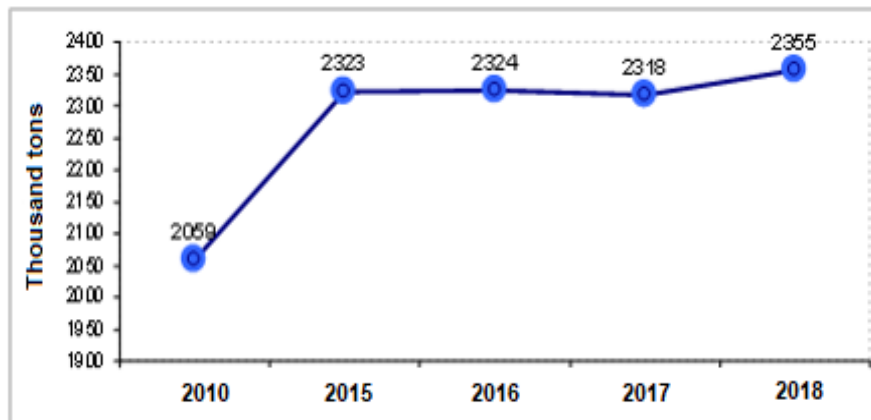


Figure 1. Meat products output in Ukraine [16]

Source: developed according to the State Statistics Service of Ukraine

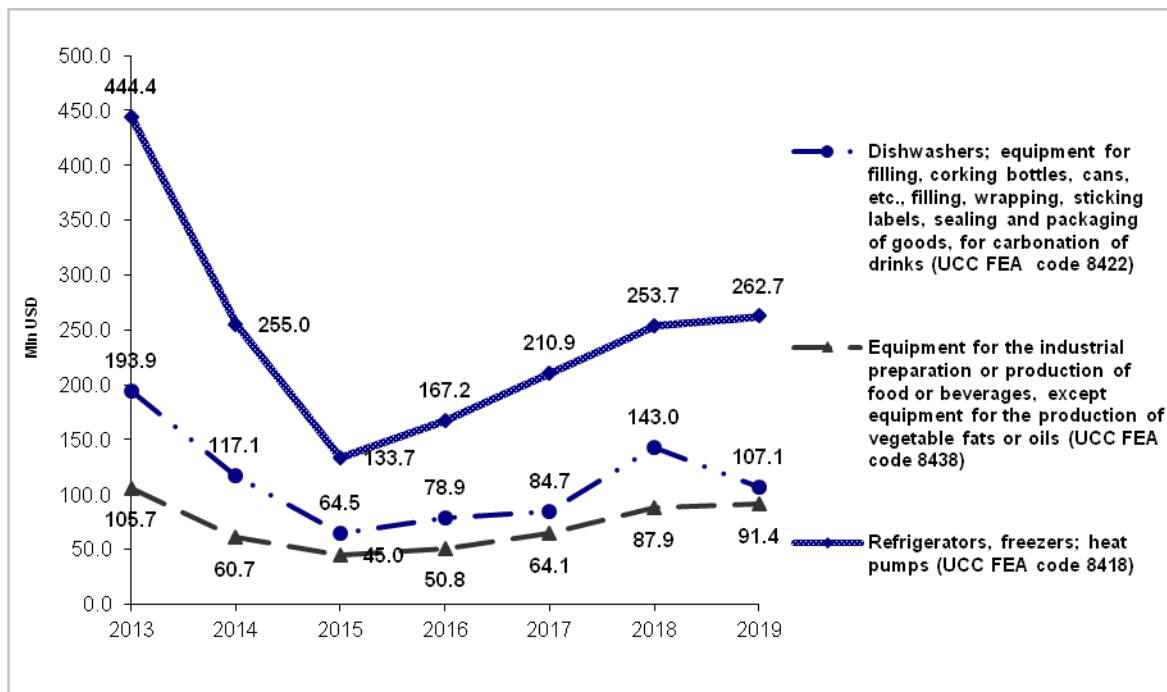


Fig. 2. Dynamics of imports of equipment for the food industry, million US dollars

Source: Customs statistics (<http://sfs.gov.ua/ms/f11>)

In Ukraine, there are several manufacturers of equipment for the thermal and climatic processing of meat products (DUKO-TECHNIK LLC, Poltavamash OJSC, NPP Tekhinserv LLC, RPE Inzhemash LLC), however, the overwhelming market share of equipment was taken by foreign

manufacturers. The leading positions in the domestic market of equipment for the production of semi-finished dumplings are occupied by Italian, Chinese and Taiwanese manufacturers. However, some types of equipment used in this production are produced by Belopillia Machine-Building Plant LLC and Smila Machine-Building Plant OJSC. Sophisticated modern equipment for packing meat and meat products (trailers, thermoformers, etc.) has not yet been produced in Ukraine - unlike vacuum-packing devices or shrink tanks that are simple in design. It should also be noted that the Ukrainian market of meat processing equipment does not go unnoticed by Turkish and, above all, Chinese machine builders who offer machines for all sectors of the meat industry - from slaughtering animals to packaging finished products.

In Ukraine, there are machine-building enterprises, which are large manufacturers of specialized technological equipment for industrial poultry farming and poultry processing. First of all, it is OJSC Poltavamash and OJSC Plant Nizhynsilmarsh. However, large industrial poultry processing enterprises are sufficiently solvent to afford the purchase of new equipment from the best world manufacturers - Dutch, French, German, etc. The need for equipment for slaughter and primary rabbit processing is satisfied through semi-amateur constructive solutions and unsystematic imports from China, Spain, Hungary, Belarus and other countries.

An analysis of the foreign trade in equipment for the processing of agricultural raw materials in 2019 indicates an increase in import operations over the past five years (Fig. 2), while the value of imports continues to significantly exceed exports (Fig. 3). All this points to the significant potential of Ukraine in providing the food industry with high-performance equipment in case of innovation.

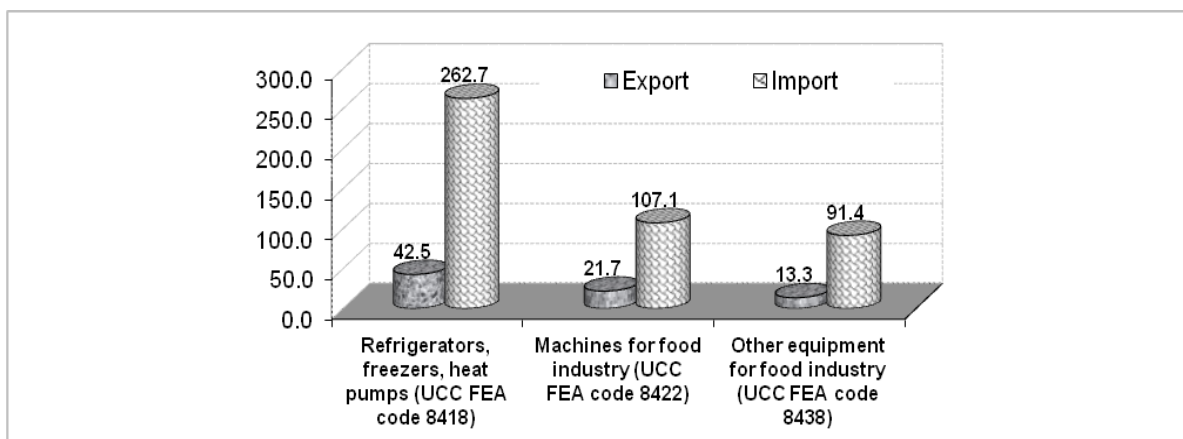


Fig. 3. Foreign trade in equipment for the food industry in 2019, million US dollars

Source: Customs statistics (<http://sfs.gov.ua/ms/f11>)

Since a significant share of meat raw materials used in Ukraine is import, there is a significant need for efficient equipment for defrosting imported meat delivered frozen - in the form of cuts or meat blocks. In modern meat processing practice, frozen meat is defrosted by processing in the air special defroster chambers equipped with automatic heating, humidification and forced air circulation systems, or (at small meat processing plants) by thawing in a stream of water. Working defrosting chambers are usually organized in adapted rooms and equipped with various heating and ventilation equipment, however, there are also offers on the market of specialized devices for this purpose made by Dutch, Finnish, French, and other companies.

Properly organized technical regulation, in particular standardization at various levels, including national one, contributes to innovative solutions in the field of equipment for the food, in particular meat, industry. In general, standardization is a collective activity aimed at establishing and implementing standards to determine the requirements that products, products, services, procedures must meet, and the main purpose of standardization is to resolve conflicts that may arise when implementing repetitive situations, as well as unification of criteria by introducing a common terminology in a certain field of practical activity [17, 18]. It is especially important, in this sense, to

ensure the proper harmonization of domestic national standards with international and European ones. A small part of the array of meat and meat product standards and a predominant share of equipment standards for the food and processing industry are now harmonized. Basically, the last group is made up of harmonized, in accordance with the Agreement on Association of Ukraine with the EU [19], European standards EN on safety and hygiene of the specified equipment - this information is given in table. 1.

Table 1. Quantity and harmonization rate of the national standards of Ukraine according to state classification codes 67.120 and 67.260 (adopted from [20])

Nomenclature group of standards according to the official classification	Number of standards*		Harmonization rate, %
	Overall	Incl. harmonized**	
67.120 Meat, meat products and other animal products	184	26	14,1
67.260 Plants and appliances for food industry	91	75	82,4

\* Standards having national power (DSTU, GOST, etc.)

\*\* National and existing in Ukraine interstate standards harmonized with European and international (DSTU EN, DSTU ISO, GOST ISO, etc.)

## 5. Conclusions

So, it can be stated that for certain positions of technological equipment for slaughter and primary processing of slaughtered animals, as well as for the production of meat products, domestic enterprises produce reliable and used equipment that is in demand in Ukraine and the countries of the former Soviet Union: equipment for the primary processing of animals and poultry, meat grinders, thermal and climatic equipment, etc. As for the segment of cheaper equipment, in this segment we observe significant activity of Belarusian, Turkish and Chinese manufacturers. We believe that the prospect of domestic machine-building for meat production is to identify fairly narrow segments of equipment of medium technical complexity (for example, very well-developed meat grinders designs), which should be improved to maintain its own niche in the domestic equipment market and possible entry into the markets of other countries. But it's technically sophisticated meat cutting equipment (vacuum cutters and emulsifiers), vacuum casing fillers, automatic brine injectors, etc. it's advisable to import so far - until our machine-building enterprises reach such a technical level that would really make it possible to produce equipment that is competitive on the world market. At the same time, in the case of innovative modernization of machine-building enterprises, domestic equipment will not yield to the best foreign models in metal consumption and reliability, level of control systems and the like.

The mastery of innovative solutions in the field of equipment for the food, in particular meat, industry is promoted by properly organized technical regulation, in particular standardization and harmonization of national standards with international and European ones.

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**ECONOMIC ASSESSMENT OF EQUIPMENT APPLICATION  
IN MODEL MEAT FARMS IN THE LIVESTOCK INDUSTRY  
OF THE WEST KAZAKHSTAN REGION**

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**Abstract:** *Based on the purpose of the study - to develop recommendations on the introduction and use of new technologies and equipment in beef cattle breeding, allowing the most complete use of the biological characteristics of animal meat breeds to reduce labor-intensive work on feeding and keeping, the research objects were selected - two livestock farms. According to the results of studies on these farms, the necessary instruments and equipment were purchased - latches, scanner readers, "smart" RFID tags, electronic scales, electric hedges, electric drinkers with electric heating, a wind-solar power station, automated machines, plants, apparatus and equipment for cooking and distribution of feed, providing a source of electricity for watering animals and for other technological, veterinary and livestock events. As a result of the calculations, it can be concluded that the introduction of new equipment allowed to reduce the cost by 675.45 thousand tenge. Additional capital investments in the amount of 15212 thousand tenge to increase the level of automation of technological processes in the basic economy will pay off in more than 2 years.*

*The increase in capital investments and current material and monetary costs should be paid off by increasing productivity, ensuring stable sales of products, reducing costs per unit of production and increasing its profitability.*

**Keywords:** *meat cattle breeding, technology, machinery, equipment, agriculture, model farm, "smart farms", digitalization of agro-industrial complex, animal husbandry, efficiency of meat cattle breeding*

**JEL classification:** L66, O14, Q16, Q18

**UDC:** 338.432: 636.03:004 (574)

### **1. Introduction**

In the Republic of Kazakhstan's livestock industry, one of the tools is the introduction of modern resource-saving technologies for feeding, keeping, and improving meat breeds used exclusively for the production of high-quality beef.

In recent years, the Republic has paid considerable attention to the development of beef cattle breeding, the transfer of the industry to an innovative development path that allows maximum use and improvement of the genetic potential of bred livestock breeds. At the same time, these technologies require a certain set of technical equipment that allows for automation and digitalization of technological processes.

In Kazakhstan, the main number of cattle is concentrated in the farms of the population, which provide most of the products of cattle breeding. Using low-yielding livestock, they also use low-yielding traditional livestock raising technologies. In this regard, Kazakhstan's science is faced with the urgent task of studying regional practices of cattle breeding, taking into account existing programs for the development of the industry, increasing the productivity of livestock and the production of environmentally friendly and safe products.

## **2. Purpose of research**

The purpose of our research is to develop recommendations on the use of new technologies and equipment in the meat cattle breeding of the Republic. To achieve this goal, the following tasks were solved: we collected, processed and analyzed official statistics on beef cattle breeding, studied official documentation on this issue; selected farms that were later used to create "model" cattle farms on their basis; equipped the selected farms with appropriate equipment, trained employees in the elements of the technology being implemented, and the use of new equipment; we determined the effectiveness of the technology being implemented.

## **3. Conditions, materials, and methods**

Based on the purpose of the work – to develop recommendations for the introduction and use of new technologies and equipment in meat cattle breeding, allowing the most complete use of the biological characteristics of meat breeds to reduce labor – intensive work on feeding and maintenance, the research objects were selected-two livestock farms specializing in the cultivation of meat breeds of cattle. One of them is a livestock farm "Ural agricultural experimental station" LLP in the West Kazakhstan region, specializing in breeding and growing beef cattle of the Hereford breed. The second farm is the farm of an individual entrepreneur Amanbekova A. E. the Farm operates under the name "IE" Amanbekova A. E.", located in the Kostanay district of the Kostanay region. The farm specializes in raising beef cattle of the Aberdeen-Angus breed (200 heads).

In order to ensure the prevention of infectious, invasive and mass non-infectious diseases of animals on the created model farms, veterinary and preventive measures were carried out. The purpose of these measures is to identify the provision of farms with veterinary and sanitary facilities and technological systems for veterinary and preventive measures.

An epizootic survey was conducted on the model farms to determine the conditions of keeping, organization and implementation of anti-epizootic measures that contribute to the prevention of the occurrence and spread of infectious pathologies among the animal population.

At the next stage of the work, studies were conducted on the selected farms on the availability of equipment to provide elements of the implemented technology of beef cattle breeding, in particular, for managing the herd, providing energy and water supply, for weighing and identifying livestock and other technological processes in the cattle farm. These studies allowed us to identify the degree of provision of farms with technological equipment and determine the necessary technical resources for creating model farms.

According to the results of the research, the necessary devices and equipment were purchased at the farms. In particular, new technological equipment and devices were purchased - retainers, scanner-readers, smart " RFID tags, electronic scales, electric fences, electric-heated car waterers, wind and solar power plants, automated machines, installations, devices and equipment for preparing and distributing feed, providing a source of electricity for watering animals and for other technological, veterinary and zootechnical events. They were necessary to provide elements of technology for growing beef cattle in model farms, as well as a comprehensive study of the impact of technologies for raising livestock on the final result of the studied farms. As a result of these measures, the total cost of the production potential of the model farm "Ural agricultural experiment station" LLP

amounted to 89662.00 thousand tenge, of which 74450.00 thousand tenge own funds, 15212.0 thousand tenge-attracted funds for the project. The total cost of the production potential of the model farm of IE "Amanbekova" was 108862,0 thousand. tenge, of which 93650,0 thousand tenge own funds, 15212,0 thousand tenge-attracted funds for the project.

At the final stage, based on the analysis and generalization of the data obtained, the efficiency of model farms was calculated, and recommendations were developed for spreading the experience of creating such farms in the Republic, where technological processes are carried out on the basis of modern technologies that will guarantee a consistently high quality of environmentally friendly and safe products.

#### **4. Results and discussions**

Today, one of the most urgent problems in the development of agro-industrial sectors is a low level of labor productivity due to low automation and digitalization of production processes. The need to meet the demand for livestock products in the domestic market of the Republic of Kazakhstan, as well as to increase the export resources of livestock products, puts before the Kazakh science and practice the task of developing, scientific justification and introduction of modern technologies for the production of low-cost, environmentally friendly, competitive products in the industry. These technologies should be resource-saving and aimed at maximizing the use and improvement of the genetic potential of farmed animals, be adapted to the specific natural and economic conditions of the regions of the Republic. Also, the development and application of energy-saving technologies in the industry will improve the impact of production on the environment, reduce the cost of material resources, and effectively use the available land and water resources. The introduction of technologies for creating winter cultural pastures in model farms will increase the efficiency of agricultural land use.

Numerous studies show that in the modern world, one of the ways to intensify the development of beef cattle breeding is the transfer and adaptation of modern technologies [1, 2].

Our research shows that the presence of significant areas of agricultural land in the Republic of Kazakhstan – arable land, hayfields, pastures, as well as agro – climatic specifics, allow agricultural production, in particular, animal husbandry, to develop in all regions of the country.

Modern agriculture of the country provides more than 4% of GDP (in 2018, the share of the industry's products amounted to 4.4% of the national GDP). In the structure of gross agricultural output in 2018, the share of livestock products accounted for 45.6%, for example, in 1990, livestock provided 62% of the country's agricultural output [3].

In the Republic, as the basis for the development of animal husbandry, its priority task is to modernize the industry, transfer it to an innovative path of development. One of the tools of modernization is the introduction of modern digital, information and intellectual technologies in the agricultural sectors [4].

The results of studying the dynamics of indicators for the development of cattle breeding in the Republic for 1991-2018 indicate that until the end of the 90s, the number of livestock and meat production in the Republic decreased. For the years 1991-1999, the number of cattle in the Republic decreased by 2.4 times, and despite the fact that since 2000 their number has increased significantly in 2018 it was only 74.5% of the number of cattle in 1991.

The structure of meat production by categories of producers has changed. Thus, in 1991, agricultural enterprises contained 67.1 % of livestock and produced 66.6 % of cattle meat. Farms of the population provided 30.1% of livestock and produced 33.3% of beef produced in the Republic.

In 2018, the main number of cattle in the Republic – 56.5%, was kept in households of the population. This category of farms provided 58.4% of the country's beef production. Another category of commodity producers – individual entrepreneurs and farms and farms contained 33.7% of livestock and produced 20.6% of beef [3]. The distribution of cattle herds by categories of producers in the Republic in 2014-2018 is shown in table 1.

Indicators of the number of cattle in the farms of the population in the regions of the Republic are different: thus, in the West Kazakhstan region, 35.2% of the population is contained in farms, 55.3% in Kostanay, and 46.8% of the number of cattle in the region in Karaganda. As a rule,

households use low-productivity livestock based on primitive technologies. Manufactured products are not competitive not only in the external market, but often in the domestic market as well.

Table 1-Structure of distribution of cattle herds and meat production by categories of farms in the Republic of Kazakhstan, %

Category of farms	2014 y.	2015 y.	2016 y.	2017 y.	2018 y.
Number of cattle					
Farms of all categories	100,0	100,0	100,0	100,0	100,0
Including: agricultural enterprises	7,6	8,2	9,1	9,8	10,0
Small interpreneurs	27,5	29,0	31,7	32,9	33,7
households	64,9	62,8	59,2	57,3	56,5
Meat production					
Farms of all categories	100,0	100,0	100,0	100,0	100,0
Including: agricultural enterprises	17,0	17,4	18,1	19,7	20,6
Small interpreneurs	15,8	17,4	18,9	20,4	21,0
households	67,2	65,2	63,0	59,9	58,4

Low-income households are almost unable to use even certain elements of modern resource-saving technologies for a number of reasons, such as their high cost (artificial insemination, constant veterinary control, etc.), lack of knowledge and skills in their use, etc. This leads to underutilization of the genetic potential of species and breeds of farm animals bred in the Republic, in particular cattle, reducing the quality and volume of production.

When creating model farms, it was assumed that the technology of beef cattle breeding is the science of methods of feeding, keeping, and improving meat breeds used exclusively for the production of high-quality beef. To characterize the implemented technology, we used indicators of the target standard for reproduction of the main herd, indicators of turnover and structure of the herd, indicators that characterize the way of keeping, feeding animals, and managing the herd [1].

Representatives of livestock breeds raised in model farms have a set of the following genetic advantages: comoleness, adaptability to climate, ease of calving, precocity (occurs at 12 months) and a pronounced maternal instinct. The animals of these breeds are given a primary role in the breed transformation, since they are able to transmit their best qualities to their offspring. Weight of calves at birth is 30 kg; weight at weaning at 7 months-184 kg; average daily weight gain-823 g; weight at 12 months-295; slaughter yield-58%.

The conducted research has revealed that in the Republic, with insufficient technical equipment of farms, the indicators of productivity and reproduction of the herd remain low. For example, an important point in the management of beef cattle is the effectiveness of the operation "cow-calf". In beef cattle breeding, the critical feature after which production becomes inefficient is the yield of calves less than 75-80 heads for every 100 available cows or 80-85 calves from 100 cows and heifers [1]. In the Republic according to official statistics in 2018 on average, 78 calves were received per 100 Queens, 66 calves in the West Kazakhstan region, and 61 calves in the Kostanay region [3].

In the created model farms, technological processes are carried out on the basis of the use of modern technologies: automated feed and water supply, the use of software for feeding and herd management, which will guarantee a consistently high quality of products. These technologies provide the farmer with an additional effect, allowing to ensure prompt decision-making and increase the efficiency of the organization and management of the farm [5].

Research has shown that overspending of resources is an important problem when raising and fattening cattle. The largest overspending occurs when using feed and labor resources, which reduces production efficiency. Therefore, even in established model farms, resource-saving measures are necessary.



The introduction of new machinery and equipment for organizing technological processes in model livestock farms has led to an increase in the indicators of stock availability and stock availability of the economy, as well as a reduction in the number of employees. Table 2 shows the assessment of the production potential of the model economy of the IE "Amanbekova" (table 2).

Table 2-Economic assessment of the production potential of the model economy of IE "Amanbekova"

№	Name	Unit	Evaluation		Rate of change, %
			basic economy	model farm	
1	Number of employees	human	4	3	-25,00
2	The area of farmland	ha	2774,00	2774,00	0
3	Average annual cost of material and technical means	Thousand tenge	93650,00	108862,00	16,24
4	Labor capital strength	Thousand tenge / human	23412,50	36287,33	54,99
5	Fund availability	Thousand tenge / human	33,76	39,24	16,24

Thus, the indicator of labor stock availability in the model farm "Amanbekova" increased by 54.99% and amounted to 36287.33 thousand tenge, the indicator of stock availability increased by 16.24%.

In animal husbandry, the development and implementation of automation tools is carried out according to different technological processes: preparation and distribution of feed, watering, water supply, manure cleaning, primary processing of products.

To assess the economic efficiency of the new technology comparison of indicators "before" and "after" implementation of appropriate equipment and the indexes of efficiency of the introduction of new equipment.

The calculation of the efficiency of capital investment in the modernization of the basic economy of IE "Amanbekova" is presented in table 3.

Table 3-Comparative economic assessment of the effectiveness of the introduction of new equipment in the IE "Amanbekova"

№	Indicators	Unit	Value		Rate of change, %
			before the introduction	after implementation	
1	Investment in new equipment	thousand tenge	-	15212,00	-
2	Labour productivity	thousand tenge	4201,46	6078,27	44,67
3	Costs per 1 head of young animals	thousand tenge	159,80	149,24	-6,60
4	Return on investment	years	-	2,64	-
5	The planned cost reduction from the introduction	thousand tenge	-	675,45	-
6	Annual economic benefit	thousand tenge	-	5756,33	-

The planned cost reduction from the introduction of new equipment was determined by the formula:

$$\Delta C = (C_{\text{б}} - C_{\text{п}}) \times B \Pi_{\text{п}}$$

where

Сб, Спр - cost of a unit of production for the basic and project versions, respectively, thousands tenge;

ВПпр - sales of products according to the project version.

Resulteing as:

$$\Delta C = (159,80 - 149,24) * 64 = 675,45 \text{ thousand tenge}$$

The annual economic effect of new equipment and technology was determined by the formula:

$$\mathcal{E}_r = (3\mathcal{C}_{\text{бз}} - 3\mathcal{H}_{\text{ов}}) \mathcal{N}_{\text{ов}} = [(C_{\text{бз}} + E_{\text{н}}K_{\text{бз}}) - (C_{\text{ов}} + E_{\text{н}}K_{\text{ов}})] \mathcal{N}_{\text{ов}}$$

where

$\mathcal{E}_r$  – economic effect of new equipment, thousand tenge;

$3\mathcal{C}_{\text{бз}}$  – the given costs for production of a unit of production using the basic version of equipment and technology, thousand tenge;

$3\mathcal{H}_{\text{ов}}$  – the cost of production using new equipment or technology, thousand tenge;

$\mathcal{N}_{\text{ов}}$  – the annual volume of production using new equipment and technology, units;

$C_{\text{бз}}$  – cost of production of the basic version, thousand tenge;

$C_{\text{ов}}$  – cost of production based on new equipment and technology, thousand tenge;

$K_{\text{бз}}$  – capital investment per unit of production of the basic version, thousand tenge;

$K_{\text{ов}}$  – capital investment per unit of production based on new equipment and technology, thousand tenge;

$E_{\text{н}}$  – normative coefficient of effectiveness.

Resulteing as:

$$\mathcal{E}_r = (159,80 - 149,24) + 0,06 * 15212,00 * 64 = 5756,33 \text{ thousand tenge}$$

Finally, the Project Payback Perriod is calculated by

$$T = \frac{k_g}{\mathcal{E}_r}$$

where

T - project payback period, years,

$K_g$  - capital investments, thousand tenge

$\mathcal{E}_r$  - annual economic effect from the introduction of equipment, thousand tenge.

As a result of the calculations, it can be concluded that the introduction of new equipment allowed to reduce the cost by 675.45 thousand tenge. Additional capital investments in the amount of 15212 thousand tenge to increase the level of automation of technological processes in the basic economy will pay off in more than 2 years.

Despite the high financial costs for the introduction of resource-saving systems of technical means in meat cattle breeding, this is the only way to develop effective meat cattle breeding in the regions of the Republic. The source of missing financial resources for rural producers can be the implementation of technical support with a differentiated selection of machines and equipment for model farms in the regions, with the calculated determination of the need for appropriate equipment of different cost and class [6].

In addition, in modern Kazakhstan, the main volumes of cattle meat are supplied by households, individual entrepreneurs, as well as small peasant or farm farms, which, for the most part, use simplified (extensive) technologies of cattle breeding [7].

It should be noted that over the past decade, the state has adopted a number of programs aimed at developing the country's agro-industrial complex. Among the activities carried out under these programs were measures aimed at the development of livestock industries, in particular, cattle breeding, through the creation of commodity farms based on the use of modern technologies [8].

### **5. Conclusions**

Thus, the introduction of new technologies that make maximum use of the biological characteristics of meat breeds for the production of competitive meat, reducing labor-intensive work on feeding and keeping animals, and improving the genetic potential of used livestock require the purchase of modern equipment. This requires an increase in capital investment and current material and monetary costs. Without them, it is impossible to ensure the implementation of the elements of technology for maximum use of the genetic potential of livestock, the most important of which are the following. Normalized animal feeding - for this purpose, automatic stations must be installed in the barns, which will ensure a differentiated distribution of the most expensive concentrated feed. The normalized distribution of animal feed will increase productivity by 12-15% and reduce the consumption of feed resources by 10-12 percent. It is important to ensure the development and implementation of energy-saving and environmentally friendly technologies adapted to specific local conditions and automated complexes of machines for cleaning manure from livestock premises, transporting it to storage and processing sites.

An increase in capital investment and current material and monetary costs should be paid for by increasing productivity, ensuring sustainable sales of products, reducing unit costs and increasing its profitability.

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## **THE CURRENT STATE AND PROBLEMS OF DEVELOPMENT OF THE AGRO-INDUSTRIAL COMPLEX IN AKTOBE REGION**

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**Abstract:** *The resource potential of the agricultural sector is of paramount importance in the formation of the specialization of the region, region, district. Production involves a certain combination and combination of elements of the resource potential. The level and effectiveness of specialization of agricultural producers depend on how the structure of the resource potential corresponds to its functional purpose, taking into account spatial and temporal characteristics. The factors of the effective functioning of agricultural enterprises are mutually beneficial economic relations between agricultural, processing enterprises and trade.*

**Keywords:** *Resource, potential agricultural sector, region, production, products, agriculture, commodity producer processing enterprises.*

**JEL classification:** Q18

**UDC:** 338.4:631.1(574)

### **1. Introduction**

The agro-industrial sector has become one of the most important sectors of the country's economy, providing the population with food products of their own production, and industry with raw materials.

The urgent task of the modern development of the agro-industrial complex is the balance of all its' links. The agro-industrial complex includes sectors that have close economic and industrial relations, specializing in the production of agricultural products, their processing and storage, as well as providing agriculture and the processing industry with means of production.

### **2. Recent research and publications analysis**

In recent years much attention has been paid to the study of priority areas for the effective functioning of the branches of the 3 agricultural sectors in market conditions. Various aspects of the formation of a streamlined economic mechanism for the functioning of the processing industry are reflected in the scientific works of leading scientists and economists of the CIS countries: Abalkina L.I., Altukhova A.I., Dobrynina V.A., Serova E.V., Karpova V.A., Orlova S.A., Smirnova T.V., Ushacheva I.G., Petrenko I.I., Samsonova O.I., Kaysheva V.G., Kayumova F.K. and many others. The economic justification of ways to increase the industry's efficiency in Kazakhstan is reflected in the scientific works of Kaliev G.A., Esirkepov T.A., Seydakhmetov A.S., Nurpeisova A.K., Akimova G.U. and others.

Despite the vast volume of research, the problems of the formation of a competitive industry in Kazakhstan remain undeveloped and a simultaneous comprehensive study of the direction of its development is not carried out taking into account the specific features of its individual regions.

### **3. The purpose of the research**

The purpose of the article is to justify the conditions for the organization of agricultural production in the Aktobe region.

### **4. Results and discussion**

The main directions of Kazakhstan's agrarian and food policy provide the solution of strategic tasks in the agro-industrial complex by accelerating the restoration of grain production, pursuing a

structural policy providing for promoting the competitiveness of domestic producers, pursuing a unified land, technological, personnel, financial policy, and information support.

Among the priority state measures to overcome the decline in agricultural production, it is envisaged: to contribute to improving the technical equipment of agriculture, developing long-term investment lending to agriculture, leasing and insurance activities, creating conditions for attracting private investment in agriculture, creating a civilized land market with the aim of transferring land to efficiently managed entities, effective integration structures, information and consultation system.

The main directions of stabilization and development of the agricultural sector are:

- development of the production potential of the agro-industrial complex at a qualitatively new scientific and technical level that meets the requirements of modern agricultural technologies;
- selection of effective forms of management, reform and financial recovery of insolvent enterprises;
- the concentration of state support in priority areas for the development of agro-industrial production, such as pedigree breeding in livestock farming, elite seed production, material and technical re-equipment of agricultural production; measures for the conservation of soil fertility.

The agro-industrial complex of the Aktobe region is a combination of industries that ensure the production of agricultural products, their harvesting, processing, and the release of food products from agricultural raw materials.

The total sown area of the Aktobe region over the last 9 years decreased by 8.7% (2019 in % compared with 2010) (Table 1).

Table 1. The area of agricultural land, thousand hectares

Index	Years			Rates of growth		
	2010	2015	2019	2015 in % to 2010	2015 in % to 2010	2015 in % to 2010
Total sown area, thousand hectares	848,3	501,4	778,3	59,1	91,7	155,2
Sown area of grain crops, thousand hectares	723,9	313,2	452,1	43,3	62,5	144,3
of them:						
- wheat	633,5	231,9	313,1	36,6	49,4	135,0
- barley	81,1	71,1	126,4	87,7	155,9	177,8
- oats	1,8	1,7	5,2	94,4	288,9	305,9
- millet	4,4	5,6	3,9	127,3	88,6	69,6
- rye	3,1	2,9	3,5	93,5	112,9	120,7
Oil crops:	23,9	32,7	29,9	136,8	125,1	91,4
-sunflower	23,9	32,7	29,9	136,8	125,1	91,4
Vegetables	4,4	3,6	4,5	81,8	102,3	125,0
Gourds	0,3	0,6	1,2	200,0	400,0	200,0
Potatoes	8,2	5,4	6,3	65,9	76,8	116,7
Other seasonal crops	87,6	145,9	284,3	166,6	324,5	194,9
- of which: forage crops	76,6	144,2	279	188,3	364,2	193,5

The structure of sown areas of farms shows that grain crops (58.1%) and fodder (36.5%) occupy approximately the same area on average over 9 years. The rest falls on the share of industrial crops (5.4% - an average of 9 years).

Analyzing table 2, it can be seen that the productivity of grain crops in 2019 compared with 2010 has been increased: wheat, barley 3 times, oats 72.5%, millet, rye, sunflower 2 times. A decrease in yield is observed in the following crops: vegetables by 7%, melons by 27%, a decrease in yield for some types of crop production occurred due to adverse weather conditions during the spring field work (table 2).

Table 2. The yield of individual crops, centner / hectare

Index	Years			Rates of growth		
	2010	2015	2019	2015 in % to 2010	2015 in % to 2010	2015 in % to 2010
Cereals, total	2,4	5,6	8,4	233,3	350,0	150,0
of them:						
- wheat	2,4	5,8	8,2	241,7	341,7	141,4
- barley	2,4	4,9	9,1	204,2	379,2	185,7
- oats	4,0	4,5	6,9	112,5	172,5	153,3
- millet	4,3	2,7	9,1	62,8	211,6	337,0
- rye	2,9	6,2	7,8	213,8	269,0	125,8
Oil crops:						
-sunflower	2,4	2,5	5,4	104,2	225,0	216,0
Vegetables	187,9	174,7	167,8	93,0	89,3	96,1
Gourds	245,6	179,4	169,6	73,0	69,1	94,5
Potatoes	123,3	159,5	163,1	129,4	132,3	102,3

The volume of gross grain products of the Aktobe region in 2015 compared with 2010 and in 2019 compared with 2015 doubled, including the collection of gross wheat in 2015 compared with 2010 doubled. Compared to 2015, in 2019, it grew by only 95%, over this period, the sown area (over 9 years) decreased by 50.6%, but as a result of improved agricultural cultivation techniques, the productivity for this period increased by 3 times, therefore, the gross harvest of wheat is growing every year.

Table 3. Gross crop production, thousand tons

Index	Years			Rates of growth		
	2010	2015	2019	2015 in % to 2010	2015 in % to 2010	2015 in % to 2010
Gross harvest of grain crops, thousand tons	64,4	164,9	403,2	256,1	626,1	244,5
of them:						
- wheat	59,7	129,8	254,1	217,4	425,6	195,8
- barley	4,1	31,2	115	761,0	2804,9	368,6
- oats	0,7	0,7	3,6	97,2	500,0	514,3
- millet	0,1	0,9	3,5	900,0	3549,0	394,3
- rye	0,4	1,7	2,6	425,0	650,0	152,9
Oil crops:						
-sunflower	3	4	15,9	133,3	530,0	397,5
Vegetables	80	63,4	86,9	79,3	108,6	137,1
Gourds	8,6	11	20,5	127,9	238,4	186,4
Potatoes	102	84,5	102,5	82,8	100,5	121,3

Of grain crops, the gross yield of barley for this period increased several times, in 2015 compared to 2010, the gross yield increased 7 times, during this period the sown area decreased by 12.3%, but due to the introduction of water-saving technology, the yield increased 2 times, therefore, in the dynamics of the gross harvest, the growth rate remained, in 2019 compared to 2015, the gross harvest increased by 3 times, during this period the sown area increased by 77%, and the yield increased by 85.7%, the volume of gross harvest of oats, millet, rye has grown several times over 9 years, it is connected with the introduction of water-saving technology for the production of grain crops, also the gross harvest of industrial crops for this period increased, including oilseeds 5 times, melons 2 times, vegetables 8.6 %. To provide the population with vegetables, the area of greenhouses was increased to 7.7 hectares. The commissioned greenhouses currently provide 30% of the region's needs (Table 3).

The number of livestock and poultry in 2015 compared to 2010 for all types of animals in terms of the conditional number decreased by 13%, but nevertheless during this period the production of meat in live weight and slaughter weight increased by 12%, because for this period the average live weight of livestock for slaughter: cattle increased by 14%, sheep and goats - by 5%, pigs - by 14%, and in 2019 the number of livestock and poultry (in terms of livestock) increased in comparison with 2015 by 26%, during this period the average annual milk yield per cow increased by 3%, but due to an increase in cows milk production during this period increased by 11%, and egg production increased by 36% due to increase in population of birds by 15.3% (Table 4).

Table 4. Livestock and poultry (in terms of conditional livestock), thousand heads

Index	Years			Rates of growth		
	2010	2015	2019	2015 in % to 2010	2015 in % to 2010	2015 in % to 2010
Cattle stock	468,1	384,9	493,5	82,2	105,4	128,2
including cows	198,8	196,4	246,8	98,8	124,1	125,6
Sheep and goats	1 149,5	1 030,3	1 127	89,6	98,1	109,4
Pigs	78,3	41,3	58,4	52,7	74,6	141,4
Horses	73,6	96,1	144,3	130,6	196,0	150,1
Camels	16,6	15,9	17,8	95,8	107,2	111,9
Bird	1401,5	1136,3	1 310,5	81,1	93,5	115,3

The development of meat and milk production stimulates an increase in the processing of agricultural products, so in 2019 compared with 2015 (over 9 years), the production of animal meat, fresh or chilled, increased 4 times, poultry, fresh or chilled, frozen 3 times, sausages and similar products from meat 2 times, the production of pasta and similar flour products increased by 2 times. And also during this period, the volumes of production of the following types of processed products decreased, these are: processed and canned vegetables decreased by 74.3%, refined sunflower oil by 58.4% (this is 28% of the capacity of processing enterprises), although the gross volume for this period sunflower production increased 5 times, and gross vegetable production increased by 8%. The decrease in the production of processed products of vegetables and refined sunflower oil is due to the fact that the price of domestic products cannot compete with imported goods.

Despite the increase in agricultural production volumes, the processing level and capacities of the processing enterprises of the Aktobe region remain not fully utilized, this is due primarily to the fact that the purchase prices for raw materials are low and the prices of finished products of the processing enterprises are not competitive with imported products. The competitiveness of processed products is determined by high consumer demand, modern technology and equipment, training, well-developed marketing infrastructure, environmental friendliness of raw materials and the introduction of management systems in production and competitive prices for manufactured products.

In total, gross agricultural output in 2015 compared to 2010 increased 2 times, and in 2019 compared to 2015 increased by 66%, agricultural labor productivity in 2015 increased compared to 2010, and in 2019 compared to 2015 grew 2 times, this is due to the growth in agricultural production.



### **5. Conclusions**

In general, in the Aktobe region in the crop and livestock sectors, the rapidly developing areas include oats, sunflower, vegetables, melons, potatoes, meat, milk, eggs, and the slow-growing industries: wheat, barley, millet, wool, and skins. In the production of processed and food products, the rapidly developing areas include the production of pasta, processed milk, the production of sausages, the unstable developing industries include prepared and canned meat products, processed and canned vegetables, and refined sunflower oil.

For further improvement of the development of the agro-industrial complex, it is necessary:

- to introduce of moisture-saving technologies into agricultural production;
- to ensure food security in the region through the use of their own rural lands, pastures, etc .;
- to carry out events to exchange experiences with foreign countries with similar climatic conditions and introduce innovative developments in agricultural production.

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**DEVELOPMENT OF THE AGRICULTURAL MARKET OF UKRAINE  
IN THE CONTEXT OF INTEGRATION PROCESSES**

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**Abstract:** *Determined the role of the agricultural sector in food self-sufficiency and formation of export flows, identified the fundamental trends of food consumptions and agro-food foreign trade. The methodological basis of the research is the system of general and special scientific methods. Empirical results, concerning the role of the agrarian corporate sector, have been obtained through retrospective analysis, grouping, benchmarking and generalization. The commodity structure research showed negative changes in value added. The share of unprocessed goods in trade increases due to a decrease in the share of processed products, which allows us to state the raw material orientation of Ukrainian agro-food exports. It was noted that attention should be focused on increasing the share of products with higher value added in agro-food exports. The prospects for increasing exports of organic products were outlined. The Ukrainian agro-food foreign trade is characterized by positive features, including an increase in value and volume of productions and exports, improved food self-sufficiency, surplus trade accretion and by negative ones, namely irrationality of the consumption structure, reduction of the share of processed products and semi-finished products in the agrarian trade structure.*

**Key Words:** *agro-food foreign trade, food security, competitiveness, commodity structure, export flows, integration processes*

**JEL Classification:** F15, Q11, Q17

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## **1. Introduction**

The agrarian sector and its most important component, agricultural production, in recent years have been among the most successful areas of the national economic complex of Ukraine. Thus, agriculture demonstrates significant rates of economic growth and high profitability, which increases its share in the macroeconomic results of the national economy. Although during the time of Ukrainian state independence (since 1991) the human and material resources of the agrarian sector have significantly decreased, the efficiency of their use has increased, the innovative component of agricultural production is growing dynamically. This allows the industry not only to fully ensure the food independence of the country, but also to play a key role in stabilizing macroeconomic indicators, which is especially noticeable in times of crisis.

Accordingly, the presence of Ukraine in the global food market is expanding. The export of agricultural and food products stably provides a significant positive balance of foreign trade and has recently formed half of the country's export earnings.

At the same time, along with obvious achievements, agri-food production and consumption in Ukraine are faced with many problems. The main ones include: structural imbalance in agricultural production; non-optimal structure of food consumption of the Ukrainian population by main

components, which poses a threat to national food security; high level of involvement of the agricultural sector in the global economy while preserving the predominantly raw materials orientation of agricultural exports and the resulting insufficient stability of financial assurance for producers during periods of unfavorable global conditions, etc.

## 2. Purpose of research

The impact of these problems on the state and prospects of development of the agricultural sector and food supply of Ukraine is supposed to be reflected in this paper, which **purpose** of is to determine the conformity of food needs of the domestic market to the recommended values and the role of agricultural production in its saturation, as well as to assess the export positions of the country's agricultural sector and the impact of global integration processes on its development.

## 3. The degree of investigation of the problem currently

Publications of domestic scientists, in particular Vlasova V., Kvasha S., Lupenko Yu., Pugacheva M., Seheda S., Zinchuk T. [1, 2, 4, 8, 17], are devoted to the current state, characteristic trends and opportunities for increasing agri-food exports of Ukraine, Paskhaver B., Sychevsky M. [7, 9] have investigated the problems of food security.

Considerable attention is paid to the study of the main directions of Ukraine's integration into the world economy and the consequences of integration processes for the domestic agri-food sector, in particular, such scientists as Ostashko T.A., Deineko L.V., Kobuta I.V. and etc. [3, 5, 6]. However, due to the diversity of the mentioned issue it can not be considered fully disclosed.

## 4. Results obtained and discussions

**Providing food needs of the domestic market of the country.** Food security is the ability of a society to ensure that people have access to healthy food. World statistical practice offers two threshold criteria for the minimum level of food security: food sufficiency is determined by its energy value and should not be less than 2,5 thousand kcal of daily ration per capita; availability of food, measured by the cost of food (a country with more than 60% of household budgets spent on food is considered as poor).

The dynamics of the indicator of food availability in Ukraine coincides with the historical trend of food sufficiency. In 1990, the average family spent 32% of income on food, in 2000 – 83%, in 2018 - 50.9%. For comparison: in the US, this figure is 10%.

The assessment of the state of food security gives the comparison of the actual level of food consumption with its normative indicators, which are approved by legislative documents (Table 1). So far, the average food consumption in the country has managed to overcome the barrier of minimum standards. At the same time, the average actual level of nutrition is significantly less than the rational norm.

Table 1: Consumption of main food-stuff in Ukraine, per capita in year, kg

Items	Standards of food consumption		
	Minimum <sup>1)</sup>	Rational <sup>2)</sup>	Actual in 2018
Bread-stuff products	95	101	99,5
Potatoes	96	124	139,4
Sugar	32	38	29,8
Oil	8	13	11,9
Eggs, pcs.	230	290	275
Meat and meat products	52	80	52,8
Milk and milk products	340	380	197,7
Fish and fish products	12	20	11,8
Vegetables and cucurbits crops	105	161	163,9
Fruits, berries and grapes	68	90	57,8
Total, kcal per day	2730	3373	2706

<sup>1)</sup> Approved by the Cabinet of Ministers of Ukraine of 14.04.2000 p.

<sup>2)</sup> Recommended by Ministry of Health of Ukraine.

Source: calculated using the data from the State Statistics Service of Ukraine.

Estimation of two sets of food energy sources: cheap (bread, potatoes, sugar, oil) and expensive (meat, fish, milk, eggs), where, in our estimation, in the first one, unit of energy value costs the consumer 4 times less than in the second one. Thus, due to the low purchasing power of the average consumer, he prefers cheap energy, for which actual consumption reaches or is slightly lower than the norm of rational nutrition. On the contrary, in terms of the set of expensive energy sources, the actual food consumption is much less than the rational norms. This indicates an unsatisfactory state of food security in Ukraine, as the average indicators of food consumption do not meet the standards of healthy eating, neither in volume nor in structure.

The reduction of food consumption occurred unevenly for different product groups. The most it affected products with high production costs and, accordingly, sales prices: meat, dairy and fish products, fruits, berries, grapes. Such change of the food consumption structure, namely, a significant decrease in the proportion of protein-vitamin products in the diets of the population, significantly reduced the overall level of physiological safety of the domestic food market. The physiological safety of the domestic market is low in terms of the ratio of plant and animal proteins in the diet, as well as in the presence of an appropriate amount of vitamins, minerals, and micronutrients necessary for the human body.

The analysis of such ratios indicates the irrationality of the consumption structure of the population of Ukraine. In 2018, the rational norms of potatoes and vegetables consumption were exceeded. During this period, the consumption of breadstuff products decreased, and as a positive trend, the excess of rational norms of consumption of vegetables should be noted. At the same time, the consumption of products such as meat, milk, fish, that is, the main suppliers of proteins for the human body, is significantly lower than rational norms. In 2018, in Ukraine, meat and meat products on average per person were consumed 34% less than the norm, milk and dairy products - 48%, fish - 41%.

The crisis of 2014-2015 led to a significant reduction of the national food market. Over these two years, food prices have risen up to 64%, so the household spending on food decreased by a third. Limited paying capacity demand is the main reason for the decline in production in the agri-food industry. In 2015, agricultural production decreased by almost 5%, food industry - by 11%, retail food trade - by almost 18%.

Results of 2016-2018 suggest that the "bottom" of the recession is behind. In 2019, agricultural production grew by 1.1%, food industry - by 3.9%, and retail food trade grew by 5.8%. Inflation of food market decreased slightly (from 111.1% in 2018 to 108.0% in 2019), but growth in real disposable income of the population was recorded (in Q3 2019, it amounted to 104.6% compared to the corresponding period of the previous year). Now Ukraine needs a strategy, which in the developed countries is named "quantitative easing policy" aimed at increasing the purchasing power of the population.

**Agricultural export potential of Ukraine.** In recent years, there has been a constant increase in the share of foreign exchange earnings from exports of domestic agricultural products. Last year, the agricultural sector provided 44% of all foreign trade revenues of the state (in 2009-2012, an average of 22%, in 2014 - 31%, and in 2016 - 42%). The volume of corresponding imports is almost four times lower, which steadily forms a positive balance of foreign trade balance of agri-food products (see Table 2).

Table 2: Dynamics of the foreign agri-food trade of Ukraine

Indicators	2005	2010	2013	2015	2018	2019
Exports, US\$ mio.	4307	9935	17024,3	14564,2	18611,8	22146,0
Imports, US\$ mio.	2684	5762	8184,0	3478,9	5055,5	5734,8
Balance, US\$ mio.	1623	4173	8840,3	11085,3	13556,4	16411,2
Share of food products and raw materials in total exports, %	12,3	19,0	26,8	38,2	39,3	44,2
Share of food products and raw materials in total import, %	7,4	9,5	10,7	9,3	8,8	9,4

Source: calculated using the data from the State Statistics Service of Ukraine.

The share of agri-food products in the country's total exports has now stabilized along with a steady increase in agri-food exports (in 2019 it increased by 4.9% compared to 2018). It should be noted that this was achieved through an increase of the physical volume of exports (the index of the physical volume of exports was 121.7%), as the price index of agri-food exports amounted to 97.5%, indicating a decrease in export prices in 2019. It indicates the long-term trend (six years in a row) of falling world food prices. Therefore, last year, domestic farmers only by increasing the physical volume of exports managed to get an additional 3.9 billion US dollars of export earnings.

Crop products and vegetable fats, primarily cereals and sunflower oil, generate almost 80% of export revenues in the agri-food group. The share of processed food products during 2005-2017 decreased from 30 to 15.9%. Among the reasons for this was the restriction on the import of agri-food products to the countries of the Eurasian Economic Union (EAEU), where they have traditionally been supplied. Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation formed this integration association on January 1, 2015. In 2017, agri-food exports to these countries amounted to 755.9 million dol. US dollars or 41% of the level of 2014, and in 2019 - 931.5 million US dollars (mainly due to exports to Belarus, which forms these volumes by 64.3%).

At present, the total volume of exports of processed food products is growing. In 2019, this growth was 6.7% compared to the previous year, but the share of this group of goods in agri-food exports after two years of growth decreased again and amounted to 14.5%.

The table 3 shows domestic agri-food exports by main importers (excluding EU countries). During 2011-2013, the main importer was the Russian Federation with a steady decline in its share in Ukrainian agri-food exports. In 2014, the Russian Federation more than halved food imports from Ukraine and ceased to be the largest importer of Ukrainian food. In 2015, the relevant trade flows decreased by 3.3 times, in 2016, due to the Russian Federation's embargo on food imports from Ukraine, they amounted to 93.0 million US dollars (4.8% of the level of 2013), in 2019 - 64.3 million US dollars.

Table 3: Dynamics of foreign agri-food trade of Ukraine with the biggest importing countries, \$ Mio

Countries	2011	2013	2014	2017	2018	2019
China	103,1	484,0	764,9	1015,3	1171,0	1953,4
Egypt	862,2	1524,3	1390,9	1257,9	888,7	1674,0
India	944,9	1079,4	1390,9	1953,4	1856,1	1545,5
Turkey	883,6	688,3	665,6	928,9	800,2	1543,9
Israel	268,4	443,5	377,6	411,2	337,0	456,0
Saudi Arabia	551,7	427,8	629,1	358,8	588,7	390,2
Iran	403,4	526,1	591,2	527,6	420,8	207,7
Russian Federation	2025,0	1941,1	911,8	102,3	92,2	64,3

Source: calculated using the data from the State Statistics Service of Ukraine.

Instead, the importance of China, India, Egypt, as well as other countries in Asia and North Africa as importers of domestic products is significantly increasing. The main market for Ukrainian agricultural products remains the Asian market, which slightly reduced its share in the structure of Ukrainian exports in 2019 to 42.2% from 45% in 2017. In 2019, the main partner Asian countries were India, Turkey and China. Currently, trade relations in the field of agri-food are intensifying with Indonesia, where agri-food exports during 2011-2019 increased from 16.3 to 561.8 million US dollars. In second place among the groups of exporting countries are the EU (a share of 33%), where the main partners are the Netherlands, Spain and Germany. The top three are closed by African countries, which in turn occupy 14.9%. The main African partners are Egypt, Tunisia and Morocco.

Despite the relatively low efficiency of the agricultural sector, low productivity compared to the world agricultural leaders, Ukraine takes significant place on world economic proportions in terms of gross agricultural production. Throughout the period of independence, Ukraine has consistently been among the top ten countries - world producers of barley, buckwheat, sunflower, potatoes, sugar beets, and now - among the top ten producers of wheat, corn, and milk are already included.

Particularly in recent years, Ukraine has been increasing fast the production of corn, rapeseed, and soybeans, which has affected its place among world producers.

Table 4: The share of Ukraine in world agricultural production indicators, %

Indicators	1992	2000	2005	2010	2014	2017	2019 expected*)
Wheat	3,5	1,7	3,0	2,6	3,3	3,6	3,8
Corn	0,5	0,6	1,0	1,4	2,8	2,3	3,2
Sunflower seed	9,7	13,1	15,4	21,5	24,5	29,0	29,9
Rapeseed	0,4	0,3	0,6	2,4	3,1	3,0	4,9
Soybeans	0,1	0,04	0,3	0,6	1,3	1,2	1,1

Source: Estimated according to the FAO

\*) Estimated according to the United States Department of Agriculture

Ukraine is also increasing its share in the world production of agro-food products with higher added value. In 2019, according to FAS USDA, Ukraine produced 32.8% of the global volume of sunflower oil, 6.1% - barley, 1.5% - milk. Accordingly, Ukraine is also a leading world exporter, in particular, of sunflower oil (1th place), corn (4th place), barley (2th place), rapeseed (2th place), wheat (5th place) and poultry meat (5th place) (table 5). Ukraine is also one of the twenty leading countries in the export of milk powder (8th place). In addition, Ukrainian agricultural exporters increased sales of honey by 1.5 times compared to 2013 and in 2018 took 8th place in the world with an export share of 4.4%.

Table 5: The share of Ukraine in world exports of agricultural production, %

Indicators	1992	2000	2005	2010	2013	2017	2019 expected*)
Barley	1,4	3,6	13,6	17,3	7,5	17,3	17,6
Corn	-	0,2	3,1	2,7	13,5	13,3	19,3
Sunflower seed	2,6	21,7	1,1	8,2	1,3	2,2	3,7
Rapeseed	0,2	0,7	2,1	7,0	11,1	8,5	20,0
Soybeans	0,03	0,02	0,3	0,2	1,4	1,9	1,6
Sunflower oil	3,7	15,3	21,3	37,6	37,8	55,8	54,8

Source: Estimated according to the FAO

\*) Estimated according to the United States Department of Agriculture

Ukraine has significant potential for increasing exports of agricultural and food products. At the same time, priority is given to increasing the share of processed foods with high added value in the overall structure of exports.

The organic market is attractive for production and export, since the profitability of such business in almost any of its segments is significantly higher than in the traditional agricultural one. According to the commercial service of the US Embassy in Ukraine, the average return on investment in Ukrainian organic farming is approximately 300%.

Research conducted by the Organic Movement Federation of Ukraine shows that the modern domestic consumer market for organic products in Ukraine began to develop from the beginning of the 2000s, amounting to: in 2004 - 100 thousand euros, 17.5 million euros in 2015, and in 2018 - 33.0 million euros. However, in terms of the volume of the domestic organic market of Ukraine, it occupies only twenty-fifth place in Europe. From each hectare of organic land in our country, the domestic market gets only 50 euros of products, while in Europe - 2345 euros. This is due to primarily export orientation of the organic production of Ukraine [16].

In the world livestock market, Ukraine does not play a significant role either as a manufacturer or as an exporter. For some time it was one of the ten largest importers of meat. At the same time, given the rather rapid development of the world meat and milk market, as well as the continued

growth of poultry farming, domestic producers will eventually have the prospect of taking their rightful place on the world livestock markets.

Increased yields and intensified production due to technological innovations will lead to increased production, even if the area of arable land remains unchanged. At the same time, new factors of uncertainty are emerging in addition to the usual risks faced by agriculture.

Further expansion and intensification in the livestock sector will lead to an increase in the use of crops for animal feed. High demand for animal products will stimulate the expansion of production in the livestock sector by increasing livestock. Combined with increased sales, this will stimulate demand for animal feed, with the share of fodder crops such as corn and soybeans expected to grow in the global crop structure. It is expected that in the next decade the growth of grain consumption for feed will exceed the growth of grain consumption for food.

This year an important factor that will affect the world and national economies is the COVID-19 pandemic, which has been felt by all sectors of the world economy. The world's leading companies are focused on how to adapt their activities to quarantine measures, save jobs and minimize their losses due to the recession. The consequences of the first months of COVID-19 for the Ukrainian economy were: reduction of GDP, complete or partial shutdown of enterprises, a sharp rise in unemployment.

It is predicted that by the end of 2020, the countries with the most stable economies will lose at least 2.4% of their GDP. The forecasts of world GDP growth rates for 2020 have also been reduced: from 2.9% to 2.4% [15]. Declining consumer demand in the European Union and the United States will have a negative impact on imports from developing countries. The economies of all countries will feel the effects of reduced world production, disruption of trade chains, reduced investment. The COVID-19 pandemic will affect all sectors of the economy, but to varying degrees. Agriculture refers to industries that are stable under quarantine measures. In these conditions, the domestic agri-food sector will be influenced by the following factors:

- global price decline due to oversupply;
- restrictions on the work of resource-supplying industries, which will lead to complications in the procurement of seeds, plant protection products and fertilizers;
- increase in orders from supermarkets to avoid shortages of certain categories of goods;
- difficulties with the sale of products for small agricultural producers;
- stable demand in the segment of basic products - bread, meat, eggs and milk;
- decline in demand for premium products due to a decrease in purchasing power.

The outlook for the agri-food sector is quite favorable. In particular, demand is expected to increase for such products as raw materials for the production of basic foodstuffs, as well as during the quarantine it is expected an increase of demand for goods with a long shelf life. After quarantine is over, a gradual restoration of individual segments depending on pricing policy is expected.

In connection with the above mentioned, it is obvious that the export agri-food potential of Ukraine will be in full demand. The main export areas will continue to be the raw material group, namely crop production (corn, wheat, sunflower seeds, rapeseed, soybeans) and vegetable oils, and fruit and vegetable export will also develop. At the same time, we can expect a dynamic increase in the export of livestock products, primarily chicken, eggs.

In the context of a pandemic, a steady increase in food demand on world markets, the growing negative impact of climate change on Ukrainian agricultural production, it is necessary to monitor the ratio of key indicators of food balances (production, consumption, changes in stocks, etc.) and constant coordination on the optimal volume of food exports in order to ensure food security of the country.

**Assessment of the impact of global integration processes on the development of the agricultural sector.** One of the main characteristics of the current stage of world economic development is the strengthening of integration processes. Ukraine, being a major producer and exporter of agri-food products, which also has significant potential for the development of agricultural production in the context of growing global demand for agricultural products, is of undoubted interest to both food-importing countries and competing states in the field of world agri-food supplies. In this

context, we evaluate the integration prospects of the agricultural sector of Ukraine and their real and expected consequences.

As noted, the agri-food complex of Ukraine annually increases the degree of involvement in the global economic system, intensifies international integration processes in the field of agricultural and food products trade. Below are the main trends and economic consequences of this in the context of the countries-main trading partners of Ukraine, primarily from among those with which agreements on the creation of free trade zones (FTAs) are concluded. Currently, Ukraine has free trade agreements with the EU, Canada, Georgia, Macedonia, Montenegro, the countries of the European Free Trade Association (Iceland, Liechtenstein, Norway, Switzerland), Israel, as well as the CIS countries (from January 1, 2016 Russia in unilaterally refused to fulfill its obligations under this agreement). Negotiations are underway on free trade zones with China and Turkey.

**EU countries.** Since 2014, the agricultural sector of Ukraine has been operating under conditions of mutual softening of the access of agri-food products to the national markets of the EU countries and since 2016, under the full operation of the Association Agreement with the EU (hereinafter referred to as the Agreement), including creation of a free trade area is provided [12].

According to Eurostat, in 2019 Ukraine maintained its position in the top three leaders in agri-food imports to the EU countries and provided more than 6% of total imports [14]. At the same time, unlike with the United States and Brazil, which occupy the first and second positions, respectively, the scope of delivery of Ukrainian products is steadily increasing relative to previous periods, for instance, almost a third compared to 2018. In total, in 2019, agricultural products worth 7.4 billion euros were delivered to the EU from Ukraine.

Along with this, the import component in trade with the EU is also increasing (by 23% in 2019 – up to 2.5 billion euros). Accordingly, agricultural commodity foreign trade between Ukraine and the EU is also growing. Thus, in 2019, it grew to 9.9 billion euros, which is almost 18% higher than the previous year. Such a turnover makes up more than a quarter of the total volumes of mutual supplies of Ukraine and the EU. The balance of mutual trade in agri-food products has always been positive. In 2019, it amounted to about 5 billion euros, which is 20% higher than in 2018. In general, assessing the consequences of signing the mentioned Agreement for the agricultural sector of Ukraine, it can be noted that for the period 2013–2019 agri-food exports to the EU grew by more than 60% with a decrease in imports by almost 20%, which led to an increase in the mutual trade balance by 3.5 times.

The main European partners for Ukraine in agri-food trade are the Netherlands, Poland, Spain, Germany, Italy, France and Belgium. The listed countries form almost 80% of the corresponding trade between Ukraine and the European Union.

Among the leading Ukrainian export agricultural products to the EU markets, as well as in general export deliveries, there were traditionally cereals, oilseeds and vegetable oil. In addition to these products, the greatest growth has taken place in export to the EU of cabbage (+ 2001.9%), pork fat and poultry fat (+ 40.9%), barley (+ 204.8%), oats (+ 125.5%), eggs (+ 229.8%), soybean oil (+ 165.8%), root crops (+ 115.8%) [10].

At the same time, according to European statistics, in 2019 Ukraine again entered the top three among fruit and vegetable producers in Eastern Europe [13]. The country ranks third place in apple production in the region, and is also one of the top three world producers of cherries and currants. In 2016–2019 export of fresh fruits from Ukraine increased from 40 to 80 thousand tons. The main positions of Ukrainian fruit export are apples and watermelons. In the segment of vegetables, onion exports increased most noticeably (from 14 to 20 thousand tons).

The expansion of supplies was the result of more competitive prices for Ukrainian goods, as well as a significant increase in the quality of domestic dairy products, which has been observed in the recent years. It is noteworthy that the Netherlands is the main European importer of both poultry and butter.

In total, according to the State Food and Beverage Service of Ukraine, in 2019, 333 Ukrainian enterprises had the right to export products to the countries of the European Union, of which 153 produce products for human consumption, 180 – non-food products. Of the indicated number of enterprises producing products for human consumption, the majority (72 enterprises) have the right to export honey to the EU, 27 – fish products, 22 – dairy products, 17 – chilled live snails, 8 – poultry



and meat products, 4 – eggs and egg products, one each – intestinal raw materials and collagen. Compared to 2018, the number of Ukrainian enterprises supplying products to the EU increased by 42 units, all of which produce food products.

Among the main obstacles to expanding the presence of Ukrainian producers of agricultural and food products in the European market is the fact that in Ukraine there are no EU-accredited laboratories with the right to conduct research and issue certificates confirming the proper quality of products. This greatly complicates and increases the cost of corresponding exports to the EU market.

Under the Agreement between Ukraine and the EU, import tariff quotas for Ukrainian products apply only for 40 commodity items. Some of them are traditionally chosen by Ukrainian producers already in the first days after the start of their operation (such as honey or poultry), while some are not used at all due to the lack of access to the EU market (for example, until now the EU market is not open for Ukrainian beef, lamb).

In 2019, Ukraine fully used quotas for duty-free export of agri-food products to the EU for 12 groups of goods, including: honey, sugar, barley groats and flour, starch and processed starch, processed tomatoes, grape and apple juices, corn and wheat, poultry, butter and milk pastes. In addition, an import tariff quota for processed cereal products was selected for 99%, and garlic – for 84%.

Ukrainian producers actively took advantage of the additional quotas that were provided by the EU as far back as 2017. Besides that, 100% additional import quotas were used for honey, processed tomatoes, barley groats and flour.

However, Ukraine did not use quotas for mushrooms, sugar syrups and processed oil products in 2019 at all.

Ukrainian experts have repeatedly noted the need to modernize and revise the current mechanism of duty-free import tariff quotas under the Agreement in order to increase its effectiveness for both Ukraine and the EU. At the same time, it is proposed to discuss with the European Commission the separation of quotas for grain and flour, the possibility of revising import tariffs outside quotas for certain types of products, the possible modification of the trade regime for those commodity items where quotas distort the market situation in Ukraine and have a negative impact, first of all, on small farmers.

Therefore, it can be stated that the interaction between Ukraine and the EU, carried out within the framework of the Agreement, brings tangible positive results for the Ukrainian agri-food complex.

**Canada.** The FTA agreement between Ukraine and Canada was signed on August 1, 2017. Already in 2018, there was an increase in mutual trade volumes, in particular, the expansion of Ukrainian exports. Thus, the export of Ukrainian goods as a whole has grown by almost half. However, according to the results of 2019, the increase was only 9%.

As for agri-food, the situation has not yet shown tangible positive. According to the agreement, since it comes into effect, among the main types of Ukrainian agri-food products that receive full duty-free access to the Canadian market, sunflower oil, sugar, confectionery and chocolate, alcoholic drinks and beer, juices are indicated. Partial liberalization includes frozen poultry meat and offal, cheese, margarine, and the like.

Just before the ratification of the FTA Agreement, Ukrainian experts and officials noted that the greatest benefits from the abolition of existing tariffs among Ukrainian producers of agri-food products should be given to producers of vegetables and fruits, sunflower oil, confectionery and chocolate, alcoholic beverages and beer. However, in 2018, compared with 2017, noticeable positive changes in the export of these products to Canada took place in only a few product groups. First of all, this concerned fruit and vegetable juices, the export of which more than doubled both in quantity and in value terms, volumes and revenues from the export of water, soft drinks and beer, chocolate and other cocoa products, cooked vegetables, fruits, nuts also increased slightly. Exports of sunflower oil remained virtually unchanged.

It can be said that the volume and value of agri-food exports to Canada are insignificant in comparison with the total export volumes from Ukraine. Consequently, the main positive result of the FTA with Canada so far can only be considered the fact of Ukrainian producers entering the demanding and highly competitive Canadian market. The expansion of domestic agri-food exports to

Canada is currently constrained by the high technological requirements that exist there, which a relatively small number of Ukrainian producers can meet.

All of the above indicates that the development of the Canadian market by Ukrainian agri-food products, although it has undeniable prospects, is slower than expected.

**Israel.** The FTA agreement between Ukraine and Israel was signed on January 21, 2019 and ratified by the Ukrainian Parliament in July 2019, and the implementation of the FTA is expected to take from 3 to 7 years. Therefore, it is too early to speak about any results of its action. We will only evaluate the current situation and potential opportunities of Ukrainian agricultural producers and exporters in this market. Dynamics of agri-food trade between the two countries in 2018-2019 on the whole, was positive, although not large enough. In particular, exports from Ukraine grew by almost one and a half times, but at the same time amounted to only about 450 million dollars (i.e. approximately 2% of the total corresponding national export). At the same time, Ukraine is a net exporter of such products.

Mostly raw materials are delivered from Ukraine, primarily cereals and oilseeds. Thus, only due to barley, corn and rapeseed, exports in 2019 grew by almost \$ 100 million. Compared to 2018, revenues from the export of waste from processing industry, in particular, sunflower oil (by 9.2 million dollars), as well as oilseed meal (by 4.5 million dollars) also increased in 2019. The largest share in the structure of Ukrainian exports to Israel is held by cereals (almost 72%), waste and residues of the food industry (9%), as well as vegetable oils and oilseeds (6% and 5%, respectively). In total, the share of finished products (groups III and II TN FEA) in 2019 amounted to about 22% of exports to Israel, which roughly corresponds to the level of such an indicator for agri-food exports of Ukraine as a whole.

Ukraine purchases mainly exotic fruits, flavors, juices, vegetables and the like from Israel.

According to experts, the liberalization of trade with Israel will primarily benefit those industries whose products are already on this market. Therefore, the goods listed above will continue to be in the list of promising for export to this country. At the same time, not only this product has prospects. Israel is interested in mineral and carbonated waters, bakery and confectionery, chocolate and other products containing cocoa. Promising products for increasing exports from Ukraine to Israel are also called cattle meat and livestock, honey, nuts, ice cream, condensed milk.

**China.** In the context of global integration of Ukrainian agricultural sector, it should not go without mention such an extremely important foreign trade partner as China. Throughout 2012-2019 agricultural exports from Ukraine to China increased 16 times – from 55 million dollars up to 1.36 billion dollars. Nowadays this country occupies a leading position in the foreign trade of Ukraine. China imports 30% of the total export of Ukrainian soybean and 14% – of sunflower oil, 26% - meal, 13% – corn, 12% – wheat flour. The list of Ukrainian enterprises that have obtained permission to export agricultural products to China is expanding annually. As of the end of 2019, such export was allowed for 35 Ukrainian dairy companies, 32 companies for the export of sunflower meal, 2 for beet pulp and 3 for frozen beef. Among the potential export destinations are, first of all, wheat and rapeseed, flour, poultry and egg products, fish and fish products, honey, apples, blueberries and sorghum.

All of the above suggests that liberalization of foreign trade in agri-food products as a whole has a positive effect on the realization of the development potential of the agricultural sector of Ukraine and macroeconomic indicators of the state. The task of Ukraine is to further expand the geography of agri-food exports while solving urgent current problems in the development of the agricultural sector and adjusting the structure of agricultural production in accordance with the needs of the domestic and global markets.

## **5. Conclusions**

According to forecasts of the development of the agricultural market, Ukraine occupies key positions in almost all segments of grain and oilseeds production and export. In the medium term, the export agricultural potential of Ukraine will be in full demand.

Prospects for the development of domestic agricultural production will be determined by the possibilities of increasing the share of product groups with high added value. In particular, Ukraine has a sufficiently large potential for increasing processing and exports not only of sunflower oil, where

our country occupies a leading position, but also of exporting grain processing products. It should be noted that products with deep processing are in stable demand in the world market, generate high prices, and can provide a significant increase in export revenues.

The Association Agreement with the EU as a whole has a positive effect on realizing the potential of the domestic agri-food complex. Every year there is an increase in trade between Ukraine and the EU countries. At the same time, the commodity range of export flows is expanding (including the export of processed products) and a significant positive balance of foreign trade in agri-food products remains. EU imports are growing mainly in complementary segments.

The signing of FTA agreements between Ukraine and Canada, as well as between Ukraine and Israel, has not yet significantly affected the volume of mutual trade in agricultural food products, although there are undoubtedly prospects for developing these markets with Ukrainian agricultural products.

Further activation of integration processes in the sphere of foreign trade depends both on the state and directly on the agricultural business. The key to success is the understanding by Ukrainian agricultural producers of the terms of trade on international markets and their willingness to comply with them, which, in addition to having competent management, is associated with considerable expenses.

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**METHODOLOGY FOR ANALYSIS OF THE DYNAMICS  
OF CROP PRODUCTION  
(ON THE EXAMPLE OF KHMELNITSKY REGION, UKRAINE)**

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**Abstract.** *The structure of sown areas and productivity indicators of leading agricultural crops in the Khmelnytsky region of Ukraine for 2000-2019, as well as dynamics graphs and trend equations of land productivity indicators for the indicated period are presented. The calculations of indicators of the stability of the productivity of the main crops that have developed over the past 20 years have been performed. A methodology for assessing changes in indicators over the study period in absolute and relative measurements is presented. It is shown economic essence of land potential in agriculture; the methodology for its determination in the production of various crops is presented. The expediency of using an indicator of the level of realization of their potential, which comprehensively reflects the achieved value of land use productivity and possible reserves while increasing agricultural production, was emphasized. In carrying out this study, general scientific and special methods were used, namely, abstract-logical - to justify the methodology for calculating potential indicators of crop productivity, the graphical method - to identify trends in crop yields of cultivated crops. The above analysis of land productivity indicators in the studied region could be useful both for university students and agricultural enterprises not only in the Khmelnytsky region, but also located in other regions, using the proposed methodology to justify potential indicators of yield growth reserves and assess yield dynamics by every culture.*

**Keywords:** *land productivity, methodology, potential and actual productivity, trend, growth reserves, stability.*

**JEL Classification:** C82, Q13.

**UDC :** 338.314 (477)

### **1. Introduction.**

Earth is the most important wealth of society, which is why the full use of its productive power is a national task. This provision is very relevant for the Khmelnytsky region of Ukraine, which has essentially complete development of the land fund. The impact of scientific and technological progress on land use efficiency in modern conditions is extremely important and is determined by many factors. The degree of this impact mainly depends on the capabilities of the industry; enterprises actively participate in the process of scientific and technological development, making their contribution to it, taking into account local conditions, and make maximum use of its results in practical activities in order to improve land use efficiency. These opportunities, in turn, are determined by a whole complex of terms that are combined by the general concept of "land potential".

### **2. Relevance of the topic and analysis of recent publications.**

In modern conditions, there is a need for a wider use of the concept of "land potential", which would reflect the real productivity of land in the current conditions of production. It should be noted

that, along with the traditional indicators of land use efficiency in cultivation (the ratio of the results of production and financial activities in value or kind to the unit of land resources used), it is advisable to use an indicator of the level of realization of their potential, which will comprehensively reflect the achieved value of land use efficiency and possible reserves increasing agricultural production.

The issues of land use efficiency are considered in the economic literature from various perspectives. In particular, the issues of land potential management as the basis for the regional economic development were considered in the works of K. Vasiliev [1], S. Volkov, N. Komov, V. Khlystun [2] and other authors. Some aspects of the problem of efficient land use are devoted to the publications of V. Miloserdov, who upholds the principle of enlarging cultivated areas in agricultural enterprises [3], EV Volkova, who offers his methodological approaches to the definition of the concept of economic potential of an enterprise [4, p.12], and A. Gridyushko. - a new paradigm of the formation of resource potential [5, p.28], Among the Moldovan authors should be noted the work of candidates of economic sciences Todorici L. and Dudoglo T., respectively aimed at studying problems stably ti agricultural production [6] assessing the level of use and productivity of land regions [7].

### 3. Research methods.

In carrying out this study, general scientific and special methods were used, namely, abstract-logical - to justify the methodology for calculating potential indicators of crop productivity, the graphical method - to identify trends in crop yields of cultivated crops.

### 4. Statement of the main material.

The area of agricultural land in the Khmelnytsky region is 1568 thousand hectares, including arable land - 1255 thousand hectares. More than 3/5 of the area is allocated for grain and leguminous crops in the sowing structure, which is clearly shown in Table 1. At the same time, the share of sugar beets, potatoes, and vegetables is insignificant. More than 3/4 of the crops are in the field of grain crops and sunflower. In this regard, it is very important to identify how effectively the cultivated area occupied by these crops is used.

Due to a sharp decrease in the number of livestock over the study period, the share of the cultivated area allocated for providing livestock feed decreased from 35.8% at the beginning of the period to 11.2% by 2019, or more than 3.7 times. Over the years, the area allocated for the cultivation of sunflower as a highly profitable crop has increased 30 times. However, in the industry, the structure of the sown area was unfavorable in terms of the development of water and wind erosion of soils. So, crops of row crops - corn for grain and sunflower - occupy more than 337 thousand hectares or 36.6% of all crops. If we take into account the area of potatoes, vegetables and corn for silage and green fodder, then the total area more prone to erosion reaches almost half of the sown area - about 435 thousand ha or 47%.

Table 1. The structure of the sown area of the Khmelnytsky region for 2000 and 2019

Name of crops	2000		2019	
	thousand ha	%	thousand ha	%
Cereals and legumes	524,0	48,9	576,3	62,4
Sugar beet	72,8	6,8	27,2	2,9
Sunflower	4,7	0,4	140,2	15,1
Potatoes	73,7	6,9	66,1	7,2
Vegetables	12,9	1,2	10,8	1,2
Forage crops	383,7	35,8	103,3	11,2
Total crops	<b>1071,8</b>	<b>100,0</b>	<b>923,9</b>	<b>100,0</b>

Source: [8]

The most indicative and illustrative are the achieved levels of crop yields. Here are the yield indicators of the four leading crops in the region over the past 20 years - 2000-2019 (table 2).

Table 2. Yields of leading crops in the Khmelnytsky region for 2000-2019  
(in farms of all categories, c/ha)

Year	Cereals and legumes	Sugar beet	Sunflower	Potatoes
2000	23,8	197,9	6,4	146,3
2001	21,4	185,2	6,0	124,6
2002	26,0	169,8	8,7	132,2
2003	18,9	217,2	8,0	130,8
2004	25,9	236,8	7,2	147,2
2005	22,2	277,9	6,8	128,0
2006	19,6	307,2	8,4	155,4
2007	25,7	377,1	12,3	199,6
2008	33,0	414,3	14,3	178,6
2009	31,6	326,3	15,9	187,5
2010	31,5	337,1	15,3	161,0
2011	40,3	348,9	18,3	213,6
2012	45,2	457,1	18,3	232,6
2013	50,0	430,1	18,9	192,3
2014	60,9	523,9	25,3	223,0
2015	53,0	438,8	26,4	163,6
2016	57,7	450,2	30,0	200,7
2017	62,2	554,3	30,0	209,3
2018	67,2	498,1	30,7	207,9
2019	65,9	513,3	36,6	165,9
Average	41,7	334,4	27,3	173,5
Stand rejected	17,0	121,1	9,6	34,1
Range of variation	48,3	384,5	30,6	108,0
Coefficient. of variation, %	40,8	36,2	35,3	19,6

Source:[8]

It is important to pay attention to the high instability of indicators, especially the yield of grain crops. So, over the studied 20 years, the grain yield per hectare of crops changed from 18.9 c/ha in 2003 to 67.2 c/ha in 2018, i.e. the variation range reached 48.3 c/ha, which is higher than the average annual yield. A similar trend is observed in other cultures.

During the analysis, calculations of the growth rate of productivity were carried out. In absolute terms, annual average annual increase in land productivity ( $\Delta q_a$ ) we find by the formula:

$$\Delta q_a = \frac{q_e - q_s}{n-1} \quad (1)$$

where:

$q_e$  and  $q_s$  - yield indicators of the final and initial period;  
n – the number of years in the study period.

In a relative estimate, productivity gains are estimated according to the expression:

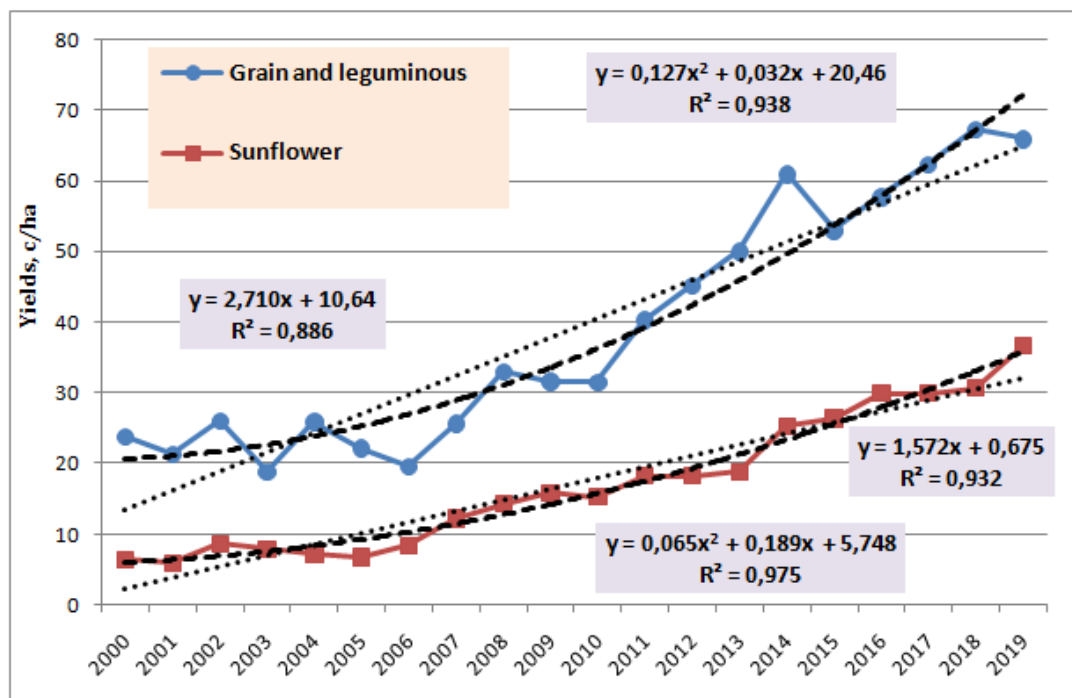
$$\Delta q_a^r = \sqrt[n-1]{\frac{q_e}{q_s}} \quad (2)$$

The yield increase in accordance with *formula 1* amounted to:

- grain crops  $\Delta q_a = \frac{65,9-23,8}{19} = 2,2 \text{ c/ha}$ ;
- sugar beet  $\Delta q_a = \frac{513,3-197,9}{19} = 16,6 \text{ c/ha}$ ;
- sunflower  $\Delta q_a = \frac{36,6-6,4}{19} = 1,6 \text{ c/ha}$ ;
- potatoes  $\Delta q_a = \frac{165,9-146,3}{19} = 1,0 \text{ c/ha}$

Relative growth in accordance with *formula 2* by:

- grain crops  $\Delta q_a^r = \sqrt[19]{\frac{65,9}{23,8}} = 1,055 \text{ or } 5,5\%$  ;
- sugar beet  $\Delta q_a^r = \sqrt[19]{\frac{513,3}{197,9}} = 1,051 \text{ or } 5,1\%$ ;
- sunflower  $\Delta q_a^r = \sqrt[19]{\frac{36,6}{6,4}} = 1,096 \text{ or } 9,6\%$ ;
- potatoes  $\Delta q_a^r = \sqrt[19]{\frac{165,9}{146,3}} = 1,007 \text{ or } 0,7\%$ .



Picture 1. Dynamics of the yield of grain crops and sunflower in farms all categories of Khmelnytsky region for 2000-2019

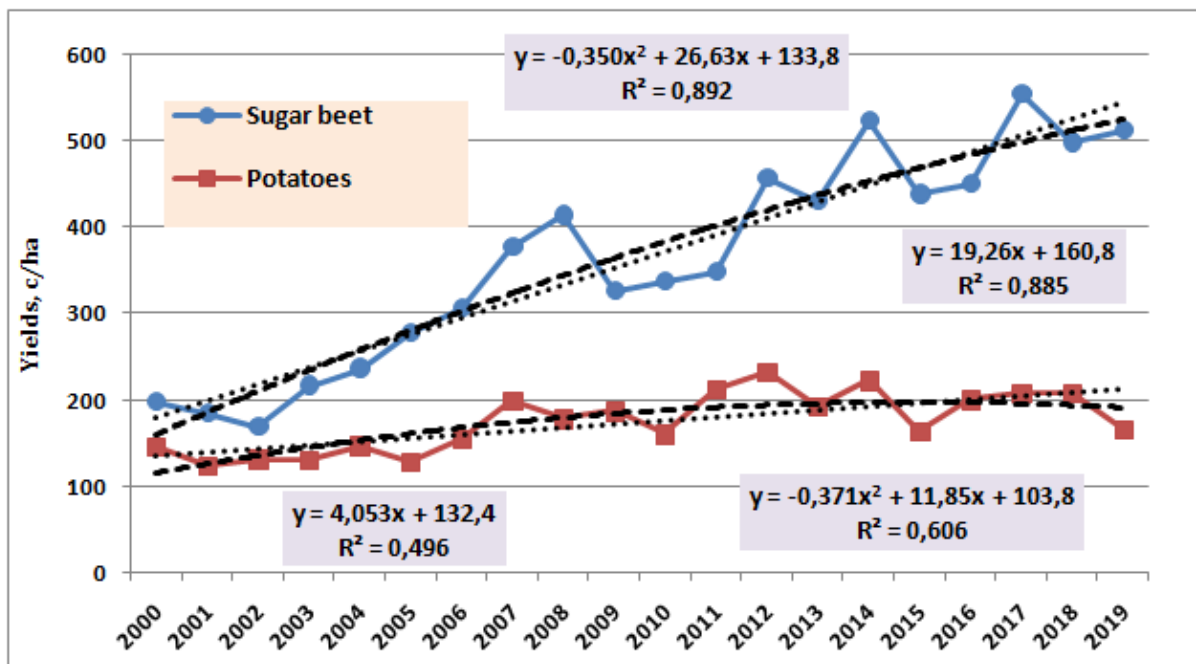
Source: made according to table 1



It is of undoubted interest to conduct a comparative analysis of land productivity in the production of all leading crops using the graphical method of comparison. Figure 1 shows the dynamics of productivity (indicating the equations of linear and polynomial trends and approximation coefficients) of grain crops and sunflower, and Figure 2 - sugar beets and potatoes.

A brief analysis shows that there is a tendency to increase land productivity in the production of these crops, taking the form of a second-order parabola. However, while in grain crops and sunflower, the tendency tends to increase yields, in sugar beets and potatoes the dynamics of the growth of field productivity is gradually dying out. On an average annual basis, the "rate" of yield growth (in accordance with the equations of linear trends) in the cultivation of crops was 2.7 c/ha, sunflower almost 1.6 c/ha, sugar beet - 19.3 c/ha and potato - 4.0 kg/ha.

A graphical representation of the dynamics of the yield of the main crops for the studied 20-year period allows us to identify the difference in the growth rates of field productivity. So, the yield of grain and leguminous crops in the region in the first period of the study, i.e. from 2000 to 2009, it is characterized by an annual yield growth of almost 0.9 c/ha (Pic. 3), and in the second period, 2010-2019, already by 3.6 c/ha (Pic. 4). Sunflower productivity increased respectively at a rate of 1.0 kg/ha and 2.3 kg/ha. At the same time, the use of graphs reveals a decrease in the growth rate of field productivity in the production of sugar beets from 24.9 c/ha in the first period to 18.7 c/ha in the second period. In the production of potatoes from 2010 to 2019, there was a tendency for a decrease in yield by almost 0.9 c/ha on an average annual basis.



Picture 2. Dynamics of sugar beet and potato productivity in farms all categories of Khmelnytsky region for 2000-2019

Source: made according to table 1

Indicators of potential land productivity, characterizing the output of a unit of area of individual crops for a certain period, it is recommended to calculate by the formula [9]:

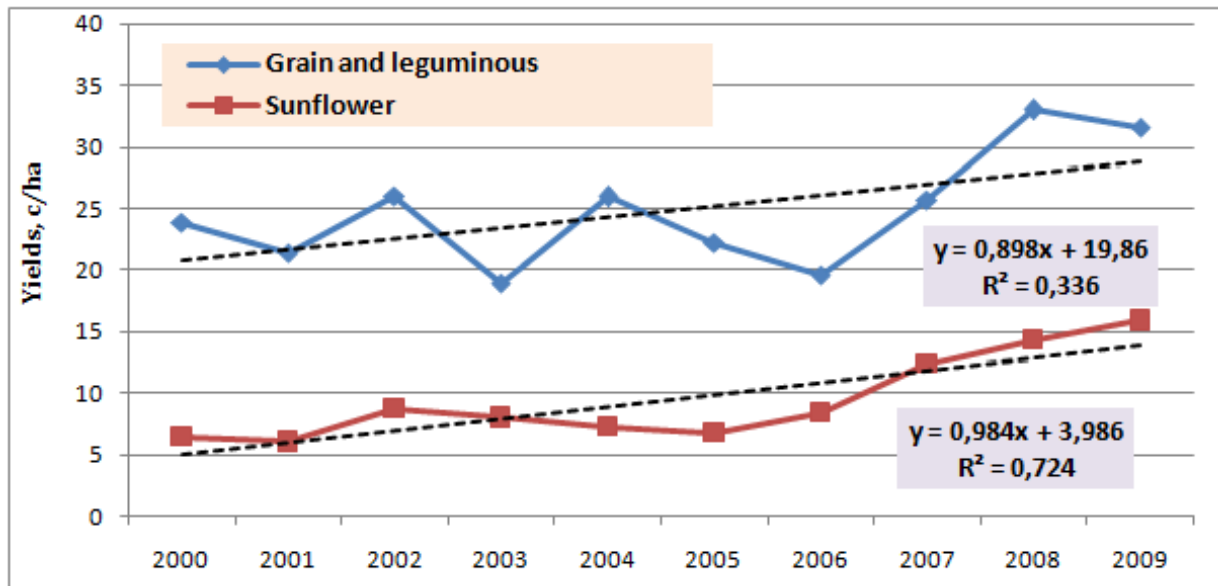
$$q_p = \sqrt[k]{\Pi}, \text{ c/ha} \quad (3)$$

where:

$k = \sqrt{T}$  ( $T$  – the number of years in the analyzed period);

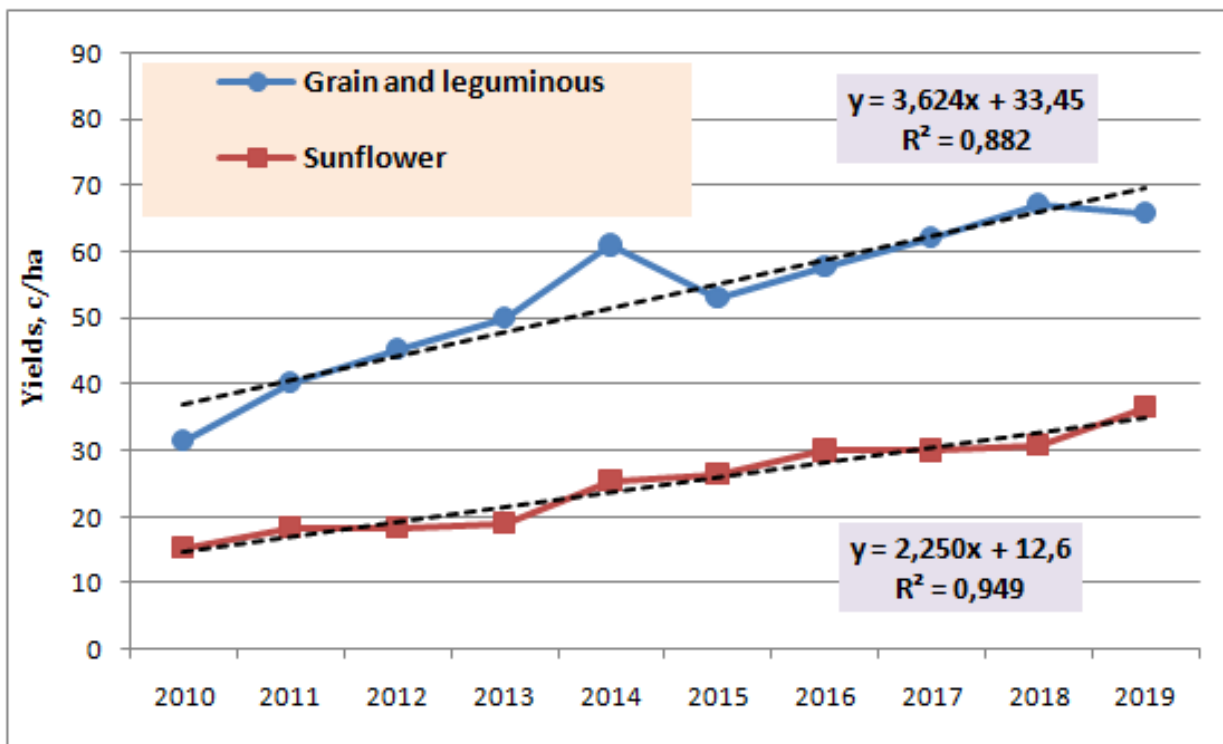
$\Pi$  – product of the highest productivity indicators for « $k$ » years.

When determining the indicators «k», the calculated values should be rounded to the nearest whole value. For example, of the 20 years analyzed, we take into account the highest rates of four years ( $\kappa = \sqrt{20} = 4,47$ ).



Picture 3. Dynamics of the yield of grain crops and sunflower in farms all categories of Khmelnytsky region for 2000-2009

Source: made according to table 1



Picture4. Dynamics of the yield of grain crops and sunflower in farms all categories of the Khmelnytsky region for 2010-2019

Source: made according to table 1

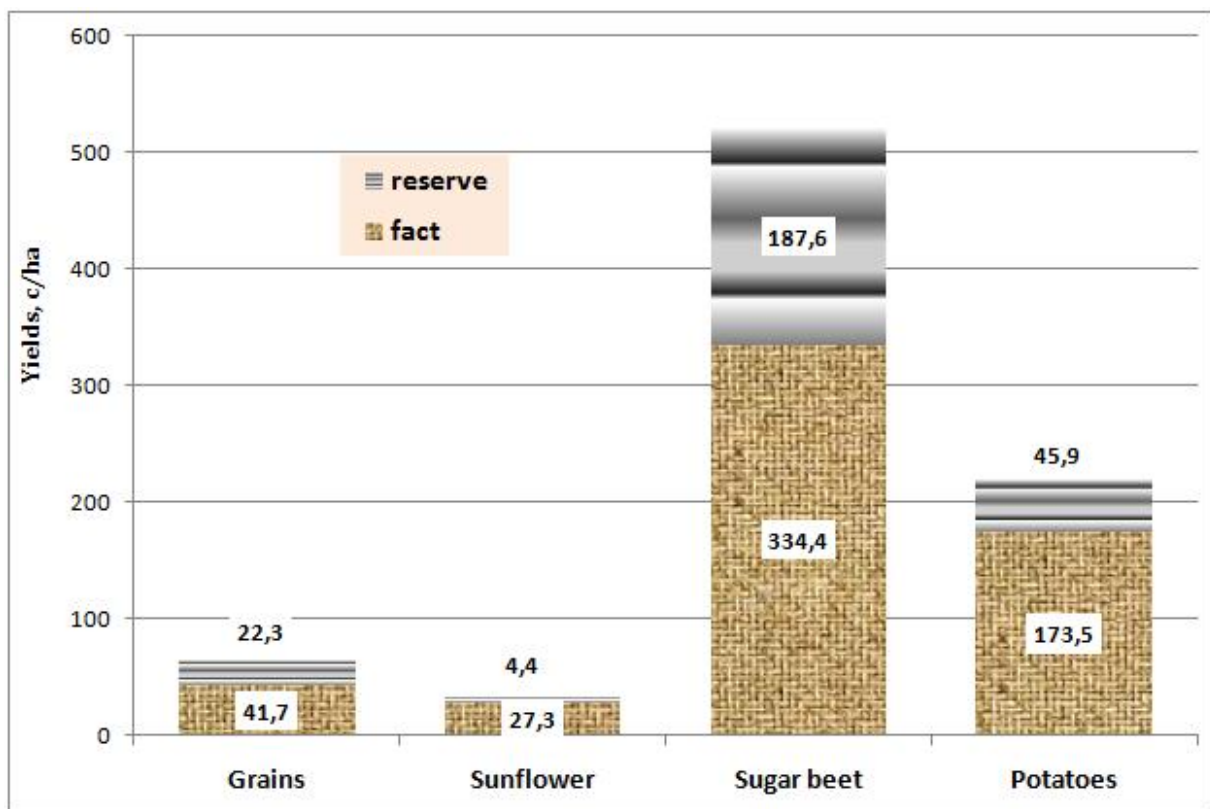
In accordance with formula 3, we determine the value of potential yield:

- cereal crops  $q_p = \sqrt[4]{67,2 \cdot 65,9 \cdot 62,2 \cdot 60,9} = 64,0 \text{ c/ha};$
- 
- sunflower  $q_p = \sqrt[4]{36,6 \cdot 30,7 \cdot 30,0 \cdot 30,0} = 31,7 \text{ c/ha};$
- 
- sugar beet  $q_p = \sqrt[4]{554,3 \cdot 523,9 \cdot 513,3 \cdot 498,1} = 522,0 \text{ c/ha};$
- 
- potato  $q_p = \sqrt[4]{232,6 \cdot 223,0 \cdot 213,6 \cdot 209,3} = 219,4 \text{ c/ha};$

The potential level of land productivity is defined as the sum of actual productivity ( $q_{act}$ ) and the real reserve for its growth ( $\Delta q$ ):

$$q_p = q_{act} + \Delta q \quad (4)$$

The presence of indicators of potential and actual crop yields of cultivated crops allows land users to identify the available reserves for increasing land productivity and, on this basis, take measures to increase the volume of gross grain harvests, industrial and other crops. The values of the reserves of productivity are graphically presented in Picture 5.



Picture 5. Indicators of actual productivity and reserves of its growth at production of main crops in the Khmelnytsky region on average for the years 2000-2019

Source: author's calculations

In conclusion, we note that increasing the sustainability of agricultural production in modern conditions is decisively influenced by a more complete use of the potential for land fertility and the provision on this basis of a substantial increase in crop yields. It is also important for each business entity to select the optimal crop structure that provides the most favorable conditions for growing crops, and to achieve high quality of all technological operations as the basis for achieving planned yield indicators. And thereby mitigate the negative impact of adverse weather and climate conditions and / or make full use of their features in the region.

The above analysis of land productivity indicators in the studied regions could be useful both for university students and agricultural enterprises not only in the Khmelnytsky region, but also located in other regions, using the proposed methodology to justify potential indicators of yield growth reserves and assess yield dynamics by every culture.

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## AGRO-FRANCHISING AS A PROSPECT FOR SMALL AGRIBUSINESS DEVELOPMENT IN UKRAINE

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**Abstract.** *The article explains main features of small businesses in the agricultural sector, as well as the advantages of small agribusiness to corporations. Agro-franchising is one of the ways of effective interaction between large and small agribusiness, which can ensure a decent standard of living and well-being of small farms. Agro-franchising is an agribusiness system that includes a large agricultural enterprise (franchisor), which operates effectively in the market, has its own well-established brand and a small entity (franchisee), which has acquired from the franchisor the right to use its trademark and business technologies. The author notes that this system of organization of agricultural production is especially relevant for private farms, as it is known that natural and high-quality agricultural products are more popular with buyers than the products of large agricultural enterprises. The use of agro-franchising promotes the introduction of effective innovative agricultural technologies and standards of agricultural production, serves as an indispensable means of increasing the popularity and competitiveness of domestic trademarks. The article describes the main advantages and disadvantages of agro-franchise. The introduction of agro-franchising by Ukrainian small producers will help to expand their social base, increase the attractiveness and prospects of small agribusiness in the eyes of young people.*

**Keywords:** *agricultural sector, small agribusiness, private farms, corporations, agro-franchising, international franchising.*

**JEL classification:** Q11

**UDC:** 338.43 (477)

### 1. Introduction.

Small business, incl. agrarian, plays a significant role in dealing with socio-economic issues of Ukraine's economy. The essence and importance of small business are the following: it is a socially significant sector of a market economy; it is the basis of small-scale production; it provides freedom of market choice, saturation of the market with consumer goods and services of daily demand, introduction of innovations, additional jobs; it has high mobility.

The main features of small businesses in the agricultural sector are the following:

- personal participation of the family or some of its members in carrying out activities;
- small volumes of production or services;
- intuitive nature of entrepreneurial activity, lack of strategy for the future;
- use of unskilled or low-skilled labor (low level of education, lack of professional skills);
- informal relationship in the course of activity;
- high dependence on natural and climatic factors that determine the seasonality of production;
- high probability of risk, which complicates access to financial and credit resources; weak support or lack of support from the state.

The main products produced in private farms are sold in small batches as agricultural raw materials at extremely low prices to intermediaries or directly to processors of agricultural products in the domestic market. This is due to the fragmentation of small farms and, consequently, the inability to compete with large producers.

## **2. Relevance of the topic and analysis of recent publications.**

Close economic relations must be established between corporations and small agribusinesses. It will require constant improvement in order to achieve the greatest efficiency in the process of cooperation between these entities. Agro-franchising is one of the ways of effective interaction between large and small agribusiness, which can ensure a decent standard of living and well-being of small farms.

Interaction between corporations and small agribusiness is covered in the scientific works of both domestic and foreign scientists. Ukrainian scientists are Lupenko Y.O, Nesterchuk Y.O., Gutorova A. O., Kropyvka M.F and others. Franchising was investigated by Dobrunova A.I., Gupalova N.A. and others.

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## **3. The main body of the academic paper.**

In modern conditions franchising acts as one of the best and most effective ways to develop a small business. This is typical for companies that have achieved some success and want to develop in future and for companies that start a business, have desire and ability to do business under the leadership of a large enterprise, gain new knowledge, experience, master and adopt innovative technologies and methods of doing business. Such cooperation is an integrated form of large and small business, which takes into account the necessary balance of economic interests of the two parties [1].

International franchising, as a form of business, is developing quite dynamically today, as franchising is an easier way for companies to penetrate world markets and does not require significant investment resources to start a business. As of today, the number of franchise companies in the world, according to the World Franchising Council (WFC), is rapidly approaching 1.5 million. Traditionally active are the fast food industry, travel companies, fitness clubs, beauty salons, health care, restaurants, child care centers, service industry. Recognized franchise leaders in the world are USA, Canada, Japan, Korea, Australia; in Europe - Germany, Great Britain, France and Poland [2].

Agro-franchising is an agribusiness system that includes a large agricultural enterprise (franchisor), which operates effectively in the market, has its own well-established brand and a small entity (franchisee), which has acquired from the franchisor the right to use its trademark and business technologies [3]. The mechanism of interaction between these entities is the following – a large agricultural enterprise gives a small business the right to use its brand, teaches business technologies and provides a guarantee of stable operation, since the success of the franchisor has already been proven in practice.

Agro-franchising is effective because of two factors: it allows to attract active but not very experienced people to agribusiness and teach them to conduct business processes effectively, and also allows to build a network business in large areas. Thus, agro-franchising is a method of replicating successful small farms that produce similar products with large agricultural enterprises.

The mechanism of interaction between large and small agricultural enterprises on the basis of the franchise model has a number of advantages:

*first*, the period of operation of small agribusiness increases significantly, risks in the sale of products are reduced;

*secondly*, the number of small agricultural enterprises is increasing, which increases the employment of the rural population;

*thirdly*, it allows to satisfy the needs of the population in natural products as much as possible;

*fourth*, increase the profitability of rural budgets.

Thus, franchising has prospects for successful development of small agribusiness.

There are thousands of examples of franchises in the United States – from taxi drivers, truckers, fast food restaurants ("McDonald's", "Starbucks") to schools. Formally, farmers in the United States are not franchisees, but in fact – yes, this way of farming was developed here historically. Franchisees are now experiencing economic growth; many farmers are members of Land-O-Lakes, CHS or the American Crystal Sugar Company. These cooperatives provide technological support,



supply of seeds, other resources and, most importantly, buy their final products. Practically the same is done by Cargill – one of the world's largest companies engaged in the supply of food, agricultural, financial, industrial goods and services around the world. In addition, all these companies offer insurance and financing. As a rule, in this case farmers do not need to have their own vehicles and storage facilities or have small buffer capacity [4].

Agro-franchise is a kind of ready-made business. The basic farm (corporation) provide the representatives of small agribusiness with equipment and inventory, young farm animals or planting material and training in production technology is also provided. Small producers, having implemented this technology, can return the finished product to the basic economy (corporation) or sell it independently.

Today, this system of organization of agricultural production is especially relevant for private farms, as it is known that natural and high-quality agricultural products are more popular with buyers than the products of large agricultural enterprises. But the lack of a system for promoting such products on the market and its monopolization by large producers, does not allow small businesses to sell their products to the extent that would allow them to function and develop effectively.

On the other hand, large agricultural producers understand that the competitiveness of their products can be significantly reduced when several small agricultural producers enter the market with their natural and quality products, so it is in their interest to integrate with such farms in advance and resell their products. In turn, small producers, when using an agricultural franchise, have a real chance of stable operation, because all products are purchased by the corporation.

The attractiveness of agro-franchising for rural areas is that there are certain advantages for franchisees: the acquisition of a franchise allows private farms to organize their own business, which will provide a stable income, corporations may expand their positions and enter new markets, and the state might have the opportunity to get an effective tool for support for rural entrepreneurship. The use of agro-franchising promotes the introduction of effective innovative agricultural technologies and standards of agricultural production, serves as an indispensable means of increasing the popularity and competitiveness of domestic trademarks, and also reduces costs when expanding a business and moving to other regions.

One of the specific features of agro-franchising is the ability to bring together partners not only from different districts or regions, but also from different countries. Work under the franchise scheme is relevant for many domestic farmers, especially for private farms, which have serious difficulties in obtaining investment, credit resources and its development, problems with technical equipment and modernization of farms, sales of agricultural products, certification, including international standards, organic food.

The positive results of the franchising model are reduction in commercial risks, increase in market share through networking, reduction in costs due to the scale of production, sales and improvement of the agricultural distribution system.

The advantages and expediency of using agricultural franchises have been proven by international practice. Agro-franchising involves spread of standardized and proven technologies for small-scale production of unique products. production of niche products is one of the promising areas of agro-franchising, however it is not profitable in large quantities: breeding rabbits by acceleration technology, creating a technological apiary, sheep breeding, fattening turkeys, geese, quail eggs, seedlings, garlic, raspberry, sprouts of flowers and vegetables, etc. For each of them there may be basic farms (corporations), which have extensive experience, in the proposed pre-replication of production therefore they organize production and provide support for project participants who have purchased technology (small agribusiness) [3].

In the field of poultry, for example, poultry farming and egg production, private farms need support at all stages – incubation of eggs or purchase of chickens, advice on feed, veterinary care, sales. When creating a technological apiary for agro-franchising, a small producer receives hives, bee packages of breeding bees, equipment, inventory and veterinary drugs. Insurance of bee colonies and hives from fire, training in beekeeping courses, manuals on beekeeping products are also provided.

*The main advantages of agro-franchise are the following:*

1. A large agricultural enterprise sells agricultural franchises for the products it exactly needs, therefore the buyer of the franchise will not have problems with its sale.
2. A large enterprise provides access to the available technologies, small producers get training, ie, in fact, small agribusiness is provided with a ready-made business.
3. The Business plan is developed to minimize business risks at realization of an agro-franchise.

The development of franchising in the small-scale sector will allow not only to transfer modern business technologies to farms, but also to provide constant methodological assistance at each stage of the project: from its inception to profit.

Agro-franchising makes it possible to increase the volume of agricultural products produced by small farms, while solving the problem of employment.

*Cons (disadvantages) of agricultural franchises.*

The main reason for the low attention to the model of interaction through franchising, from large enterprises today is that they almost fully provide existing markets and do not want to create competitors. After all, after the transfer of technology, seeds, livestock and poultry, the franchisee will be able to realize the results of their work not only to the franchisor, but also freely in the market, thus there is a possibility that market share that previously belonged to the franchisor will go directly to the franchisee.

The Small Fruit franchise project is successfully operating in Ukraine – the cultivation and subsequent export of organic berries, which was developed by the consulting company Franchising Full Cycle. Small Fruit is an agricultural enterprise organized in 2011, its main activity is the cultivation and direct export of environmentally friendly products – berries (including raspberries) and fruits. At the beginning of its activity the enterprise grew products on the area of 12 hectares, now the total area of land plots is more than 300 hectares in 11 regions of Ukraine. Small Fruit products are certified in accordance with the European Standard for Organic Production and Processing and are fully exported to EU countries [5].

Thanks to the agro-franchise, snail farms began to appear in Ukraine only a few years ago and now there are more than 500 of them - small and large with their own processing and export abroad. Ukrainian producers sell snails mainly to the EU. This is the main opportunity to earn, because the culture of consumption of such products in the domestic market is extremely low, and manufacturers do not have high expectations for its improvement.

However, such active exports make it possible to predict that the number of snail farms in Ukraine will grow to at least 1,500, or even 3,000, said the co-founder of "Snail-2016" and Ukrainian Snail Holding processing company, Serhii Danylenko [6]. In recent years, the company has helped 81 shellfish farms to open and is working to launch another 30 in 2020. Also, "Snail-2016" sold the first franchise in Ukraine for a snail farm with a capacity of 50 tons per year. The minimum investment in the snail business is estimated at € 15 thousand. In the first year, due to investments, the producer buys fixed assets, builds a base for reproduction and cultivation of mollusks. For the second and subsequent years, the main costs will be wages and feed for snails – 25-30% of the total cost structure [6].

There is a shortage in the global snail market today, although the number of farms in the EU alone is quite high – up to 3 thousand, and according to unofficial data, up to 10 thousand farms in each country (in Poland the official number of snail farms is 1000 units, although there might be more of them – 2-3 thousands. There are officially 2,500 farms in Spain, and 3,000 farms in France [6].

In previous years, there were several attempts to adopt the Law on Franchising in Ukraine, but none of them was successful. Meanwhile, such laws have successfully operated in developed countries, helping to regulate a lot of controversial issues of this business. In EU countries, clear criteria have been approved for evaluating franchise agreements in accordance with local antitrust law and a specific list of provisions, that are prohibited from being included in franchise agreements, has been adopted due to the risk of possible restriction of competition as such. In the United States, more than a hundred franchise laws have been passed at the federal level [2].

In the EU more than 60% of companies are franchised companies. According to the latest data, about 90% of this business in the EU is growing due to specific targeted loans. For example, in Italy, each new franchisee can receive from the Italian Franchise Association about € 50 thousand,



50% of which is a special grant and another 50% is a loan at a low interest rate from the state. This has more than doubled the number of franchisees in the last few years [2].

Targeted franchising lending in Ukraine is almost non-existent, and although many banks until 2014 declared their readiness to lend to franchising, in reality everything looked completely different. Franchising is an investment with increased risk for banks, as well as the usual business from scratch or a startup. It was much easier to get a loan if the franchise is no longer the first business and not the only one, and the entrepreneur already has a good financial history.

Agricultural franchising can supplement the system of consumer and production agricultural cooperation, and sometimes can be an alternative when the sale by small farms does not meet expectations. Small batches of products, which are not always certified, are usually not of interest to large purchasing and processing companies. With the development of agro-franchising and a new approach to sales, large horizons of prospects will open to small business.

The introduction of agro-franchising by Ukrainian small producers will help to expand their social base, increase the attractiveness and prospects of small agribusiness in the eyes of young people. Thanks to the agricultural franchise, agricultural products will become more popular.

#### 4. Conclusions.

Franchising in Ukraine is a promising area of economic activity and in the coming years there will be growth in this segment. Franchising has a number of advantages and disadvantages that allow to reduce operating costs and increase the efficiency of production activities, which is especially important for Ukraine in modern conditions.

For the long-term development of franchising in Ukraine it is necessary to: ensure its legal regulation; create a network of training and consulting centers for the study of franchising in the country; select strong basic farms; develop packages of various agricultural franchises by basic farms (3-5 months); subsidize the costs of developing agricultural franchises; perform information campaign on agro-franchising in the regions; conclude agro-franchising agreements; receive and select applications for subsidies for the implementation of agricultural franchising; subsidize small business for the costs of implementing agricultural franchises.

Agro-franchising is an effective form of relations between corporations and small producers, which will significantly increase the efficiency of small agribusiness, and, consequently, ensure a decent standard of living and well-being of rural residents.

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## **DEVELOPMENT TRENDS OF HOTEL AND RESTAURANT BUSINESS IN UKRAINE**

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**Abstract.** *The article examines the dynamic changes in the number and composition of economic entities engaged in temporary accommodation and catering; the indicators of the volume of produced and sold products are analyzed, the volume of sold products in terms of consumer categories is revealed; the share of employees in this area is highlighted and their dynamics and share in the total number of economic entities of the country are revealed. Problems on the development of hotel and restaurant services in Ukraine are highlighted and ways to solve them are suggested.*

**Keywords:** *hotel and restaurant business, business entities, temporary accommodation and catering, economic activity.*

**JEL classification:** H11

**UDC:** 338.48 (477)

### **1. Introduction**

Today, the service sector plays an important role in the Ukrainian economy, in turn, the sphere of "hotel and restaurant services" is quite attractive for those who are starting a business. This business category occupies about 3% of all registered business entities in Ukraine. The hotel and restaurant business as one of the components of the tourist infrastructure has a significant potential for the country in the form of stable revenues in the budgets of all levels. As a sphere of entrepreneurial activity, the management of temporary accommodation and catering performs social (satisfaction of consumer needs) and economic functions (production and circulation of products). This type of activity is a promising opportunity for capital investment and innovative development, as the return on investment is sufficiently quick. Given the above, the issue of development of the hotel and restaurant industry is relevant for both practical businessmen and scientists, thus requiring constant research.

### **2. Analysis of recent research and publications**

The study of economic activity of Ukrainian enterprises in the hotel and restaurant industry was pursued by such researchers as V.V. Arkhipov, G.V. Dovgal, T.G. Kovalchuk, A.A. Mazaraki, M.P. Malska, A.O. Obozna and others. However, the problematic aspects related to the modern economic development of entrepreneurial activity of temporary accommodation and catering need to be investigated in detail.

### **3. The objective of the article**

The objective of the article is to study the development of hotel and restaurant business in Ukraine and determine the prospects for its further development.

### **4. The main body of the academic paper**

One of the main components of the tourism industry of Ukraine is the hotel and restaurant business, which contains a range of services to meet the needs of tourists. The development of the

tourist infrastructure, the competitiveness of the national tourist product at the domestic and world level depends on the success of the service sector.

To determine the level of development of the hotel and restaurant business in Ukraine, we use the available statistical data. When assessing economic entities by type of economic activity the State Statistics Service of Ukraine takes the "Temporary accommodation and catering" data into account for statistical accounting of this sphere of services.

The dynamics of the number of temporary \*-accommodation and catering is demonstrated in Table 1. The total number of subjects of this type of activity: growth during 2013 - 2015, decline in 2016-2017 and from 2018 increase - by 7.3%. The total number of enterprises increased in 2018 and is equal to 7535 units, which is 12.2% of their total number (Fig. 1).

Table 1. Number of business entities by type of economic activity "Temporary accommodation and catering"

Years	Number of business entities, units			Share of the number of enterprises and natural persons-entrepreneurs in the total number of business entities, %	
	Total	Including		Including	
		Enterprises	Natural persons-entrepreneurs	Enterprises	Natural persons-entrepreneurs
2013	52077	10096	41981	19,4	80,6
2014	57553	7885	49668	13,7	86,3
2015	58436	7700	50736	13,2	86,8
2016	57696	6544	51152	11,3	88,7
2017	57578	7285	50293	12,7	87,3
2018	61761	7535	54226	12,2	87,8

Source: Prepared by the author according to [1, 3, 4] data.

Analyzing the activities of economic entities for temporary accommodation and catering, it should be noted that the share of enterprises in their total number is insignificant: in 2013 it was 19.4%, and already in 2014 - less than 13.7% (Table 1). More than 80% of economic entities in this type of economic activity are natural persons-entrepreneurs and their share has increased by 7% in 6 years since 2013.

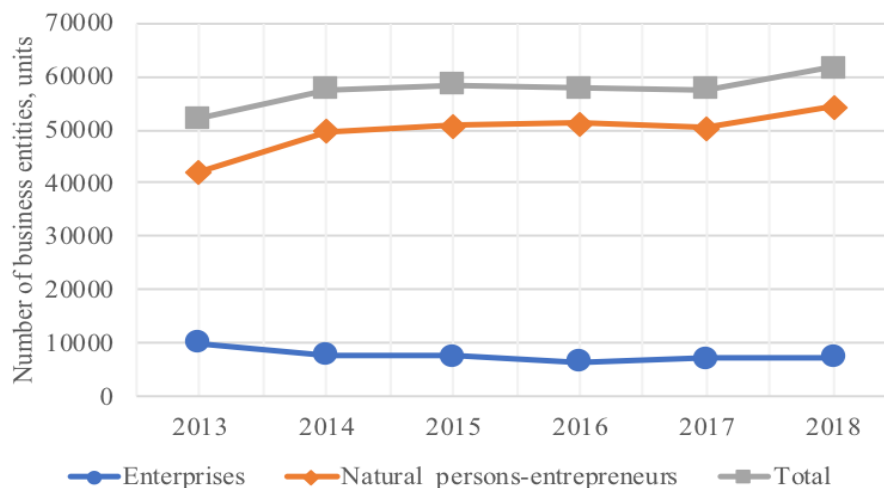


Fig.1. Dynamics of economic entities by type of economic activity "Temporary accommodation and catering"

According to statistics, the largest decline in the number of facilities in this area due to the crisis was observed in 2016 and continued into 2017. And only 2018 data show positive dynamics - growth in the number of institutions by 4183 units (7.3%).

Regarding the volume of products offered by economic entities for temporary accommodation and catering, it should be noted that this indicator determines the value of the products (goods, services) actually produced by the enterprise, which includes products manufactured and shipped (or intended for shipment) outside the enterprise, products made at their own expense to invest in the company, as well as ensure other non-financial income [5, p.12]. During the study period for all business entities (enterprises and individual entrepreneurs) in this area, the dynamics of decline in 2014 and gradual growth until 2019 is demonstrated (Table 2, Figure 2).

Table 2. Volume of products (goods, services) of business entities for temporary accommodation and catering

Years	Volume of products (goods, services) mln.,UAH			Share of volume of output (goods, services),%		Specific share of output volume (goods, services),%	
	Total	Enterprises	Natural persons-entrepreneurs	Enterprises	Natural persons-entrepreneurs	Enterprises	Natural persons-entrepreneurs
2013	19300,9	12579,1	6721,8	66,3	33,7	0,8	5,4
2014	16790,1	11134,4	5655,7	64,5	35,5	0,6	3,5
2015	19158,2	12355,0	6803,2	60,4	39,6	0,5	2,9
2016	26664,3	16109,1	10555,2	58,4	41,6	0,6	3,2
2017	37674,6	22002,5	15672,1	53,3	46,7	0,7	3,4
2018	47081,6	25079,3	22002,3	65,2	34,8	0,8	3,8

Source: Prepared by the author according to [1, 3, 4] data.

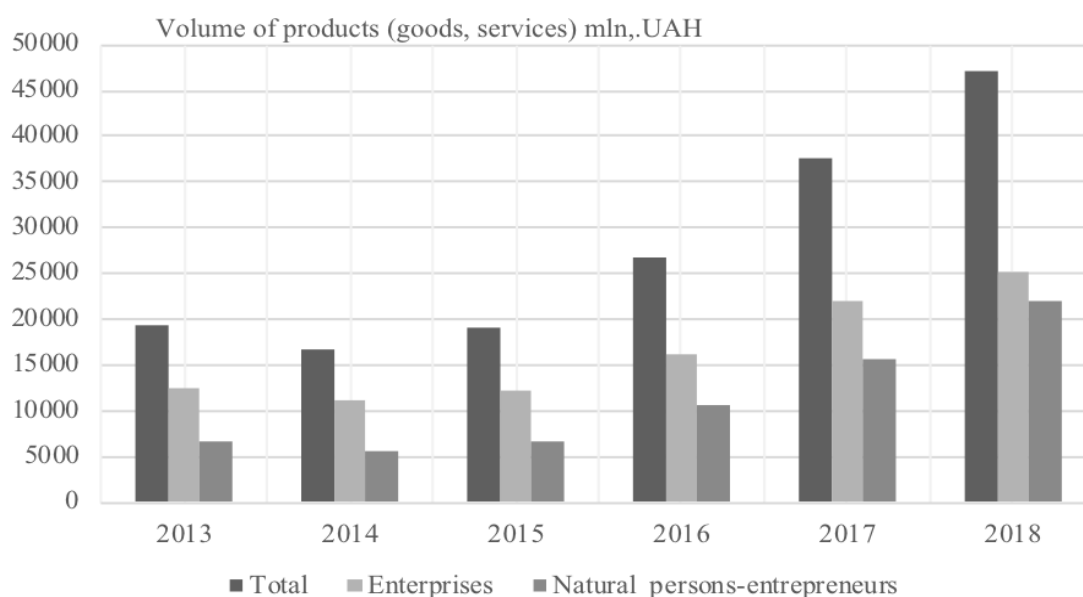


Fig.2. Dynamics of the volume of products (goods, services) of subjects of activity on temporary placement and catering 2013-2018.

The positive dynamics of the volume of products (goods, services) is present since 2015 and the annual growth is an average of 30%. In 2018, the volume of products produced by business entities for temporary accommodation and catering is UAH 47,081.6 million, which is 27% more compared to the previous year. A significant part of the output in 2018 was provided by enterprises - 65.2%, and natural persons-entrepreneurs - 34.8%.

The share of the volume of products of business entities by temporary placement and catering in the total volume of products in Ukraine is on average- enterprises - 0.7%, natural persons-entrepreneurs - 3.3%. It should be noted the increase in the share of output by service entities since 2015 and in 2018, this figure is the maximum, namely: enterprises - 0.8%, individual entrepreneurs - 3.8%.

The next indicator that characterizes the activities of the subjects by the main type of activity "temporary accommodation and catering" is the volume of sold products. The volume of sold products (goods, services) of the subjects of temporary accommodation and catering is the turnover of restaurants, cafes, bars, canteens, mobile food service providers, including the amount of trade margin, the cost of products spent on cooking, and the cost of purchased goods for sale and the cost of services provided by hotels, motels, rest homes, camps, campsites, and other facilities of temporary accommodation [5, p.11].

The volume of sold products of business entities for temporary accommodation and catering for the last 4 years (2015-2018) increased within 20-30%. The volume of sold products in 2014 decreased significantly (-25.1%), which may explain the decrease in the volume of manufactures products. In 2018, the volume of sold products amounted to 63,591.5 mln UAH, which is 30% more than last year (Table 3).

Table 3. Volume of sold products (goods, services) of business entities for temporary accommodation and catering 2013-2018

Years	Volume of sold products (goods, services), mln UAH			Share of goods sales (goods, services),%	
	Total	Enterprises	Natural persons- entrepreneurs	Enterprises	Natural persons- entrepreneurs
2013	30322,4	16726,9	13595,5	0,7	4,8
2014	22684,6	14346,3	8338,3	0,5	2,9
2015	29069,3	18250,0	10819,3	0,5	2,7
2016	37613,4	23083,8	14529,6	0,6	3,0
2017	48965,2	29548,2	19417,0	0,6	3,2
2018	63591,5	36700,0	26891,5	0,7	3,5

Source: Prepared by the author according to [3, 4, 5] data.

The positive dynamics of sales is present since 2015, with 25 % average annual growth. During the study period, the largest increase in sales was recorded in 2018, almost 30% compared to the previous year. A significant part of the sold products in 2018 was provided by enterprises - 57.7%, natural persons-entrepreneurs - 42.3% of the total production.

Among the volume of sold services by categories of consumers in % to the total for the last three years (2017-2019) the most services by temporary accommodation and catering sold to the population - more than 70%, about 27% - enterprises (institutions), other categories of consumers - only 2%. As of January 1, 2020, the volume of services provided by enterprises of the hotel and restaurant industry was 15% higher than in the previous year [1, 6, 7].

The economic indicators that characterize the activities of economic entities include the number of employees. The share of employees in the field of hotel and restaurant services in the total number of business entities in Ukraine is insignificant and averages 3% in the group of enterprises and 5% among individual entrepreneurs (Table 4).

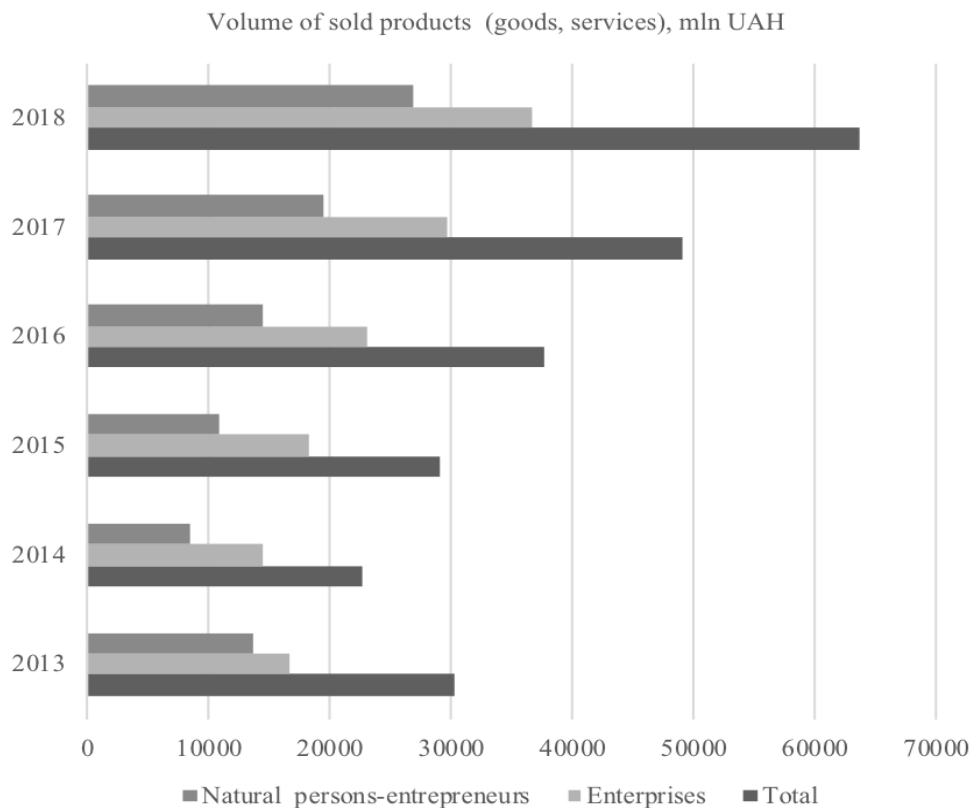


Fig.3. Dynamics of the volume of sold products of the subjects of activity on temporary accommodation and catering 2013-2018.

Table 4. Number of employees in the subjects of temporary accommodation and catering 2013-2018

Years	Number of employees in business entities, thousand people			Share of the number of employees in business entities, %	
	Total	Including :		Including :	
		Enterprises	Natural persons-entrepreneurs	Enterprises	Natural persons-entrepreneurs
2013	267,5	132,6	134,9	2,7	5,8
2014	213,2	101,5	111,7	2,4	4,5
2015	195,2	87,9	107,3	2,3	4,7
2016	207,9	90,3	117,6	2,5	5,1
2017	224,2	92,9	131,3	2,7	5,6
2018	269,8	98,7	171,1	3,1	6,6

Source: Prepared by the author according to [3, 4, 5] data

During the study period, the number of employees in temporary accommodation and catering has been increasing since 2016, the dynamics of reduction is present in 2014-2015. In 2018, the number of employees in the hotel and restaurant industry is 269.8 thousand people, which is 20% more than the previous year. It should be noted that the number of business entities is growing among

individual entrepreneurs and in 2018 the number of employees is 171.1 thousand people (+30%), while in enterprises the increase in this indicator is quite slow.

Among the business entities for temporary accommodation and catering, mostly small and micro businesses operate; their number is on average 99.5% and 95.2% of the total number of entities in this area.

Less than one percent are medium-sized businesses, and there are no large business entities in the service sector at all. This situation can be partly explained by a certain "shredding" in recent years of both medium and small enterprises. Today, for micro-enterprises there are relatively more attractive conditions for doing business: a simplified taxation system and greater "flexibility" of micro-business in critical conditions [2].

### **5. Conclusions**

Hotel and restaurant business as one of the components of the tourist infrastructure has a significant potential for Ukraine, given the prospects of tourism for the country, which has with a rich historical, cultural and natural resource potential. Therefore, research in this area today is on the periphery of scholars and practitioners' interest.

The share of hotel and restaurant facilities in the total number of business entities in the service sector is insignificant and is less than 15% and about 3% of all registered business entities in Ukraine. More than 80% of temporary accommodation and catering businesses are sole proprietors and their share has increased by 7% in 6 years since 2013. Over the last five years, there have been fluctuations in the total number of entities in this type of activity: growth during 2013-2015, decline in 2016-2017 and increase from 2018.

Based on the analysis of the activities of business entities for temporary accommodation and catering it is established:

1). Positive dynamics of the volume of output, which is present since 2015 and the annual growth is an average of 30%. More than half of the output is provided by enterprises - more than 60%, natural persons-entrepreneurs account for 34.8%. The share of the volume of products produced by the hotel and restaurant business in the total volume of products produced in Ukraine is: by enterprises less than 1%, natural persons-entrepreneurs - about 3%.

2). The volume of sold products of business entities for temporary accommodation and catering for the last 4 years (2015-2018) increased within 20-30%. This indicator decreased significantly in 2014 (-25.1%), which may explain the decrease in output, and in 2018 it increased by 30% compared to last year. The share of the volume of sold products of the hotel and restaurant sector is slowly growing in the total volume of products produced in Ukraine since 2015 and on average it is: by enterprises - 0.6%, individuals - entrepreneurs - 3.4%.

The positive dynamics of the volume of services sold by enterprises for the last two years should be highlighted: 2018 - an increase of 13%, 2019 - by 15%.

3). More than 70% of hotel and restaurant services were provided to the population, about 27% - to enterprises (business), only 2% - to other categories of consumers. In 2019, the volume of sold services of hotel and restaurant enterprises is 15% higher than in the previous year.

4). The number of employees in the hotel and restaurant industry during 2013-2018 varies: the dynamics of reduction is present in 2014-2015, and since 2016 - the number of employees is growing; the figure for 2018 exceeds the previous year by 20%. It should be noted that the increase in the number of business entities is observed among individual entrepreneurs and in 2018 the number of employees increased by 30%), while in enterprises the increase in this indicator is quite slow.

Thus, the hotel and restaurant business in Ukraine is developing at a slow pace. Since 2017, there has been a gradual increase in the number of business entities for temporary accommodation and catering and the growth of economic indicators of their activities, indicating an improvement in the financial and economic condition of enterprises in the hotel and restaurant industry in Ukraine. The main reasons for the slowdown in the domestic hotel and restaurant market in certain years are: the political and economic crisis in Ukraine, hostilities in the east of the country, and the global crisis.

In our opinion, the priorities for the successful development of the domestic hotel and restaurant industry are as follows: 1) stabilization of the political and economic situation in the

country, which in turn will create favorable conditions for its investment; 2) increased welfare of the population to intensify the use of hotel and restaurant services; 3) innovative development of enterprises, which will ensure the progress of this industry not only in the domestic but also in the global market of services.

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\* \* \* \* \*

## INSTRUCTIONS TO AUTHORS

The *Economic and Engineering Studies* publishing series of the *Scientific Journal of Cahul State University "Bogdan Petriceicu Hasdeu"* aims to disseminate the research results in the fields of trade, management and economic development, the engineering researches and innovative ideas with potential application in practice by public and private institutions, entrepreneurs and investors, and other users interested in these fields.

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Technical and editorial issues:

- papers will only be submitted **in English**;
- total content of the articles should be 6-10 pages (references included);
- a good correspondence between title and content of the article is necessary;
- the paper will have the following structure: title, name(s) of author(s), abstract, keywords, JEL classification (for papers in the field of economics), expanded content of the paper, references;
- the content of the paper will be **in English** and will correspond to mandatory requirements stipulated in the normative acts developed by the Academy of Sciences of Moldova (ASM), the National Council for Accreditation and Attestation (NCAA), the Supreme Council for Science and Technological Development (SCSTD);
- the main elements of the scientific paper will be: the summary (in English), the keywords (in English), 1. Introduction, 2. The degree of investigation of the problem currently, and purpose of research, 3. Methods and materials applied, 4. Results obtained and discussions 5. Conclusions, References;
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**Word file format A4 (paper size 21 cm x 29,7 cm).**

The paper margins should be: top – 2 cm; bottom - 2 cm; left – 2,1 cm; right – 2,1 cm.

### **PAPER TITLE**

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**Abstract** (*Times New Roman, size 10 pt, italic, justified alignment*)

*The abstract will contain approximately 150-200 words and it should emphasize the reasons for the research problem selected, the main research methods used and some key findings, focusing on the original contributions of the author(s). It is recommended to avoid using references within this paragraph.*

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The Introduction (Times New Roman, 11 pt, normal, justified alignment) will highlight the essence, motivation and rationale of research, identification of the problem/issues, an overview of the compartments and ideas to be addressed in the content of the paper.

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The compartment shall contain the description of research algorithm, presentation of the main methodological procedures and investigative tools. Materials applied will be subject to analysis by highlighting notorious scholars, progressive ideas, etc.

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This compartment will register the original research of the author / authors with discussions on the topic and the results achieved.

The sections will have to respect the following editorials rules:

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Times New Roman, 10 pt, normal	Times New Roman, 10 pt, normal	Times New Roman, 10 pt, normal
Times New Roman, 10 pt, normal	Times New Roman, 10 pt, normal	Times New Roman, 10 pt, normal

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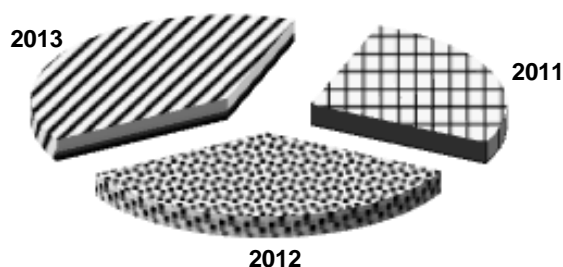


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Conclusions should reflect, according to the appropriate scope of originally proposed research, the synthesis of the main ideas and results achieved by the author/authors in the investigated area, which were exposed in the article.

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BULAT, G., MOLDOVAN-BĂTRÎNAC, V., ȘAVGA, L. New Dimensions of Education Reform in the Republic of Moldova: Equity, Relevance, Efficiency and Sustainability, *Review of International Comparative Management*. 2012, 11 (3), 445-453. ISSN 1582-3458.  
TCACIUC, Cl., HACINA, L., GUȚU, A. Study on corporate social responsibility of cooperative enterprises in the Republic of Moldova, *Economy Transdisciplinarity Cognition*. 2012, 15 (1), 218-225. ISSN 2068-7389.
- **for web-sites**  
Human Development, International Living. <http://internationalliving.com/2010/12/quality-of-life-2011/> (vizitat 12.06.2013).  
Joint social partners structures and restructuring: Comparing national approaches. <http://www.eurofound.europa.eu/publications/htmlfiles/ef0918.htm> (vizitat 06.07.2013)

- **for patents**

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The article submitted for publication follows peer-review process organized in two stages of assessment:

- 1. editors of the Editorial Board;*
- 2. two reviewers from home and/or abroad with competence in the field of research.*

Manuscript assessment is carried out on an anonymous basis without identifying the author/authors.

At both stages of reviewing process the recommendations and comments of reviewers are made known to the author/authors in order to improve the quality of the publication.

The manuscript, rejected at the first stage of evaluation, is forwarded for repeated review to an expert in the field (professor, associate professor) from the Cahul State University "Bogdan Petriceicu Hasdeu".

Only after acceptance of article at first stage, the manuscript can be sent for evaluation by two reviewers from home and/or abroad (professor, associate professor).

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- 1. Accepted in its original form;*
- 2. Accepted with minor changes;*
- 3. Accepted with substantial changes;*
- 4. Rejected.*

The Article accepted by the reviewer on condition of making substantial changes can be re-evaluated by the same expert in the scientific field for compliance to recommendations, elimination of inadequacies and improvement of the quality of intellectual work of the author.

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The final decision on the publication of articles in the current issue of the journal shall be adopted under the advisory of the Editorial Board members and consideration of reviewers' recommendations from both phases of the review process.



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